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LIVING WORLD 1

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1. A living organism is unexceptionally differentiated from a non-living structure on the basis of
a) reproduction b) growth and movement c) interaction with environment
d) responsiveness.

2. **Assertion:** Living organisms are self replicating, evolving and self regulating unit.

Reason: Living organisms are capable of responding to external stimuli.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

3. Taxonomic key is one of the taxonomic tools in the identification and classification of plants and animals. It is used in the preparation of
a) monographs b) flora c) both (a) and (b) d) none of these.

4. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Royal Botanical Garden Kew	(i) Lucknow
B. Indian Botanical Garden	(ii) England
C. National Botanical Research Institute	(iii) Howrah
D. Llyod Botanical Garden	(iv) Darjeeling

- a) A-(ii), B-(iii), C-(i), D-(iv) b) A-(i), B-(iii), C-(ii), D-(iv) c) A-(iv), B-(ii), C-(i), D-(iii)
d) A-(iv), B-(iii), C-(ii), D-(i)

5. Herbaria are useful in
a) Understanding the distribution of plants b) Observing the habitat of plants
c) Identification of plants d) Indicating list of plants in a particular area

6. Read the following statements.

P: The taxonomic hierarchy for *Brassica campestris* can be written as

Plantae → Phanerogamae → Angiospermae → Dicotyledonae → Parietales
→ Brassicaceae → **Brassica** → **campestris**.

Q: Tautonym is the taxonomic designation used for certain plants having trinomial nomenclature.

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R: A character present in an ancestral species and shared exclusively by its evolutionary descendants is referred to as synapomorphy.

S: Family Fabaceae is divided into three sub-families, i.e., Leguminosae, Mimosaceae and Caesalpiniaceae.

Which of the following combinations of above statements is correct?

a) P and Q b) P and R c) R and S d) P, R and S

7. The suffix '-oideae' is used for

a) tribe b) family c) class d) subfamily

8. **Assertion:** Consciousness is a defining property of living organisms.

Reason: Human being is the only organism that has self consciousness.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

9. **Assertion:** Order is a taxonomic category that includes one or more genera.

Reason: All the genera in an order have some similar features and co-related characters.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

10. The third name in trinomial nomenclature is

a) species b) subgenus c) subspecies d) ecotype

11. The taxonomic category below the level of family is

a) class b) species c) phylum d) genus

12. The internationally recognised binomial nomenclature was developed by Linnaeus in his book

a) Philosophia Botanica b) Historia Plantarum c) Species Plantarum
d) none of these

13. 'Aves' taxonomically represent a

a) family b) order c) class d) phylum

14. First step of taxonomy is

a) Characterisation b) Identification c) Nomenclature d) Classification

15. Select the incorrect statement out of the following.

a) All animals belonging to various phyla are assigned to the Kingdom Animalia.

b)

As we go higher from species to kingdom, number of common characteristics goes on increasing

- c)
Different classes comprising fish, amphibians, reptiles, birds and mammals together constitute the Phylum Chordata
- d)
Plant order Polymoniales includes the families like Solanaceae and Convolvulaceae based on the vegetative and floral characters
16. Which of the following sets does not contain defining characteristics of living organisms?
a) Growth and reproduction b) Metabolism and cellular level of organisation
c) Response to stimuli and consciousness d) All of these
17. Read the following statements and select the correct ones
(i) Increase in mass and increase in number of individuals are twin characteristics of growth.
(ii) Metabolic reactions can be demonstrated outside the body in isolated cell-free systems.
(iii) 'Response to stimuli' is a defining property of living organisms.
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)
18. In a herbarium, sheets are arranged according to
a) Regionally accepted system of classification
b) Universally accepted system of classification
c) Nationally accepted system of classification
d) Locally accepted system of classification
19. Plants were given Latin names because it is a
a) simple language b) common language c) dead language d) none of these.
20. Botanical gardens mainly serve the purpose of providing
a) beautiful area for recreation b) reservoir for tropical plan
c) ex situ conservation of germplasm d) natural habitat for wildlife.
21. Botanical gardens and zoological parks have
a) collection of endemic living species only b) collection of exotic living species only
c) collection of endemic and exotic living species
d) collection of only local plants and animals
22. Taxonomy comprises
a) Identification b) Classification c) Nomenclature d) All of these
23. **Assertion:** New names in binomial nomenclature are derived from Latin or are latinised.
Reason: Latin is a technical language.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
24. Study of principles and procedures of classification of organisms is

- a) Classification b) Taxonomy c) Nomenclature d) Grouping
25. Which of the following statements regarding the response of living organisms to external stimuli is correct?
- a) The external environmental stimuli can be physical, chemical or biological.
b)
All organisms, from the prokaryotes to the most complex eukaryotes can sense and respond to environmental stimuli.
c)
Consciousness and response to external stimuli is the defining property of living organisms
d) All of these
26. **Assertion:** Living organisms show internal as well as external growth.
Reason: Living organisms undergo the process known as accretion
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
27. In which order, will you place gorilla?
a) Carnivora b) Diptera c) Sapindales d) Primata
28. Potato, tomato, brinjal differ in this taxon
a) Species b) Genus c) Family d) Order
29. Which one of the following books was contributed by Linnaeus
a) Systema Naturae b) Historia Plantarum c) Historia Naturalis d) All of these
30. Tanvi bought ten food items from the supermarket, which are wheat, bananas, mushrooms, onions, **Porphyra** (Laver), Kelps, pine seeds, **Sphagnum** moss, lady's fingers and potatoes. Based on hierarchical classification, how many different phyla/divisions do these items belong to?
a) 3 b) 4 c) 5 d) 6
31. National Zoological Park is situated at
a) Delhi b) Lucknow c) Jaipur d) Darjeeling
32. Who wrote "**Species Plantarum**" and provided a basis for the classification of plants?
a) Carolus Linnaeus b) Charles Darwin c) Carolus Linnaeus d) Charles Darwin
33. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Ecology	(i) Relationships of organisms and environment
B. Herbarium	(ii) Original specimen cited by an author
C. Holotype	(iii) A hierarchical unit
D. Taxon	(iv) Collection of wild and domestic plants

- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(i), B-(ii), C-(iv), D-(iii) c) A-(i), B-(iv), C-(ii), D-(iii)
d) A-(iv), B-(ii), C-(iii), D-(i)
34. Which among the following is INCORRECT with respect to the universal rules of biological nomenclature?
- a)
The first word in a biological name represents the genus while the second name denotes the species
- b)
The specific epithet starts with a capital letter while the generic epithet starts with a small letter. It can be illustrated with the example of mangifera indica
- c) Biological names are either derived from Latin language or Latinised.
- d)
Both the words in a biological name, when handwritten are separately underlined or printed in italics to indicate their Latin origin.
35. Amongst all the kingdoms, the only taxon that exists in nature as a biologically cohesive unit is the
- a) species b) genus c) phylum or division d) kingdom
36. Study the following statements and select the correct ones.
- (i) Herbarium is a store house of collected plant specimens that are dried, pressed and preserved on sheets.
- (ii) Flora provides the index to the plant species found in a particular area.
- (iii) Monographs contain information about particular taxon.
- a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)
37. The label of a herbarium sheet does not carry information on _____.
- a) Date of collection b) Name of collector c) Local names d) Height of the plant.
38. An English naturalist, who wrote the book '**Historia Generalis Plantarum**' and introduced the word 'species' was
- a) Theophrastus b) John Ray c) Cuvier d) Lamarck
39. Study the following statements regarding the preparation of herbarium sheets.
- (i) Plant should be collected in flowering stage.
- (ii) Every detail regarding the plant such as locality, ecological conditions, vegetative and floral characters, etc. should be noted.
- (iii) Plants are evenly pressed by unfolding all the plant parts between blotting papers (or newspapers) with the help of plant pressers.
- (iv) Blotting papers need not be changed until the plant gets dried.
- (v) After drying, the plant specimen is carefully mounted! pasted on the herbarium sheets.
- (vi) The herbarium sheet is labelled on the lower right hand corner representing the number of plant specimen, date of collection, etc.
- Which of the above statements is/are not correct?
- a) (i) only b) (iv) only c) (i) and (iv) d) (iii) and (iv)
40. Which term can be used for any taxonomic rank?

- a) Class b) Taxon c) Family d) Cohort
41. Carolus Linnaeus belonged to
a) France b) Germany c) Sweden d) Holland.
42. The fundamental taxonomic category is (basic unit is)
a) Family b) Class c) Genus d) Species
43. **Assertion:** In binomial nomenclature, both words are separately underlined.
Reason: Underlining indicates their Latin origin.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
44. The taxonomic unit 'Phylum' in the classification of animals is equivalent to which hierarchical level in classification of plants?
a) Class b) Order c) Division d) Family
45. Which of the following is the correct representation of organisation levels in living beings?
a) Subcellular → Cellular → Individual → Community → Population
b)
Atomic → Molecular → Subcellular → Cellular → Tissue → Organ system → Individual
c)
Individual → Population → Organ system → Tissue → Cellular → Molecular → Atomic
d) Atomic → Molecular → Tissue → Individual → Ecosystem → Community
46. The statement 'nothing lives forever, yet life continues, illustrates the role of
a) embryogenesis b) morphogenesis c) replication d) reproduction.
47. The basic unit upon which the systems of classification are based is
a) species b) genus c) order d) family
48. Angiosperms have dominated the land flora primarily because of their _____.
a) Power of adaptability in diverse habitat
b) Property of producing large number of seeds c) Nature of self Pollination
d) Domestication by man
49. Mango belongs to this order
a) Anacardiales b) Poales c) Sapindales d) Polymoniales
50. According to binomial nomenclature, two words used for naming a plant or animal are
a) Family and genus b) Species and family c) Class and family
d) Genus and species
51. Which one of the following is not a correct statement?

- a) A museum has collection of photographs of plants and animals.
 - b) Botanical gardens have collection of living plants for reference.
 - c) Herbarium has dried, pressed and preserved plant specimens.
 - d) Key is taxonomic aid for identification of specimens.
52. Which of the following categories possesses maximum number of related characters?
a) Order b) Phylum c) Class d) Species
53. Arboretum is a part of botanical gardens where
a) bonsai are made b) beautification is done c) palms are grown
d) big trees are cultivated in the form of forests
54. Which of the following organisms does not reproduce?
a) Mule b) Worker bee c) Infertile human female d) All of these
55. The earliest classifications were based on
a) Reproduction of plants b) Uses of plants c) Diversity of plants
d) Evolutionary relationship of plants
56. A pair of contrasting characters in keys is called
a) Doublet b) Duplet c) Couplet d) Triplet
57. Founder of binomial nomenclature was
a) Linnaeus b) Mendel c) Darwin d) Lamarck.
58. _____ are useful in providing information for identification of names of species found in an area.
a) Flora b) Manuals c) Monographs d) Catalogues
59. Which of the following figures represents the correct method of pressing plants to form herbarium sheets?



- a) Figure A as the plant parts are folded. b) Figure B as every plant part is unfolded.
 - c) Both figures A and B as folding or unfolding does not matter d) None of these
60. Mangifera is a
a) variety b) genus c) species d) orders
61. First life on earth was _____.
a) Cyanobacteria b) Chemoheterotrophs c) Autotrophs d) Photoautotrophs
62. The scientific name of banyan is written as **Ficus benghalensis** L. Which of the following statements is correct regarding this?
a) Letter L. signifies Latin language
b) The name should be written reverse with **benghalensis** preceding **Ficus**
c) Letter L. signifies the taxonomist Linnaeus. d) **benghalensis** is a generic name.

63. Homeostasis is _____ .
a) Tendency to change with change in environment b) Tendency to resist change
c) Disturbance in regulatory control
d) Plants and animals extracts used in homeopathy
64. Genus represents
a) an individual plant or animal b) a collection of plants or animals
c) group of closely related species of plants or animals d) none of these.
65. Which of the following 'suffixes' used for units of classification in plants indicates a taxonomic category of 'family'?
a) -Ales b) -Onae c) -Aceae d) -Ae
66. Basic unit or smallest taxon of classification is
a) species b) kingdom c) family d) variety
67. Choose the correct expression
a) a group of related genera - Family b) a group of related species - order
c) a group of related families - class d) a group of related orders - genus
68. Match column I with column II and select the correct option from the codes given below.
- | Column I | Column II |
|-------------|------------------------|
| A. Planaria | (i) Binary fission |
| B. Fungi | (ii) Asexual spore |
| C. Yeast | (iii) Budding |
| D. Amoeba | (iv) True regeneration |
| | (v) Fragmentation |
- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(iv), B-(ii), (v), C-(iii), D-(i) c) A-(ii), B-(v), C-(i), D-(iv)
d) A-(v), B-(ii), (i), C-(iii), D-(iv)
69. Scientific names to the plants are given based on the principles provided by
a) BSI b) ICBN c) IUB d) ICZN
70. Which one of the following organisms is scientifically correctly named, correctly printed according to the International Rules of Nomenclature and correctly described?
a) *Musca domestica* - The common house lizard, a reptile
b)
Plasmodium falciparum - A protozoan pathogen causing the most serious type of malaria.
c) *Felis tigris* - The Indian tiger, well protected in Gir forests
d)
E.coli - Full name *Entamoeba coli* a commonly occurring bacterium in human intestine.
71. Which of the following statements regarding the universal rules of biological nomenclature is incorrect?

- a) Biological names are generally in Latin and written in italics.
- b)
- The first word in a biological name represents the genus while the second component denotes the species.
- c)
- Both the words in a biological name, when handwritten, are separately underlined, or printed in italics to indicate their Latin origin.
- d)
- The specific epithet starts with a capital letter while the generic epithet starts with a small letter. It can be illustrated with the example of **Mangifera Indica**
72. Lowest and highest taxonomic categories are respectively
- a) Division, species b) Species, division c) Species, kingdom d) Phylum, genus
73. **Assertion:** Systematics is defined as the science of diversity of organisms in evolutionary context.
- Reason:** Systematics include interrelationship between organisms
- a)
- If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
- If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
74. A collection of species which bear a close resemblance to one another in the morphological characters of the floral parts is known as
- a) family b) variety c) genus d) division.
75. 'Key' is a taxonomical aid used for the identification of organisms. Each statement in key is called a ____.
- a) couplet b) lead c) both (a) and (b) d) none of these
76. In a taxonomic hierarchy, family is interpolated between
- a) kingdom and class b) class and order c) order and genus d) class and genus
77. Which of the following serves as a quick referral systems in taxonomical studies?
- a) Museum b) Zoological park c) Herbarium d) Botanical garden
78. In a taxonomic hierarchy, genus is interpolated between
- a) order and species b) family and species. c) kingdom and class d) phylum and order
79. Select the mismatched pair.
- a) *Panthera leo* - Belongs to Class Mammalia
- b) *Musca domestica* - The common house lizard, a reptile
- c) *Entamoeba coli* - Commonly occurring protozoan in human intestine
- d) *Solanum tuberosum* - A dicotyledonous plant
80. In biological terminology, a group of similar organisms which are capable of interbreeding and producing fertile offsprings is called

a) species b) genus c) tribe d) family.

81. **Assertion:** All organisms reproduce for perpetuation of a population.

Reason: Reproduction is an all inclusive characteristic of living organisms.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

82. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. John Ray	(i) Gave the concept of new systematics
B. C. Linnaeus	(ii) First described species as a unit of classification
C. Aristotle	(iii) Father of Zoology
D. Julian Huxley	(iv) Introduced binomial nomenclature

a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(iv), B-(ii), C-(iii), D-(i) c) A-(ii), B-(iii), C-(i), D-(iv)
d) A-(ii), B-(iv), C-(iii), D-(i)

83. In the binomial system of taxonomy, developed during the 18th century by C. Linnaeus, the second word of an organism's biological name represents

a) species b) genus c) race d) family.

84. Which of the following statements is incorrect?

a) Term 'Nothospecies' refers to the naturally occurring interspecific hybrids.

b)

As the species do not change with time, therefore they are considered as static groups.

c)

Metabolism and response to external stimuli are considered as the defining properties of living organisms.

d)

Hibiscus rosa - sinensis belongs to the same family to which **Althaea rosea** and **Gossypium hirsutum** belong to.

85. Two animals belong to the same kingdom but different classes. They may belong to the same

a) phylum b) order c) division d) species

86. Which of the following taxonomic categories includes one or more related orders?

a) Phylum/Division b) Genus c) Family d) Class

87. **Assertion:** Metabolism refers to the sum of chemical reactions that occur within living organisms.

Reason: Metabolic reactions occur simultaneously inside living organisms

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of

c) If assertion is true but reason is false. d) If both assertion and reason are false.

88. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Botanical garden	(i) Preserved plant specimens
B. Zoological park	(ii) Preserved plant and animal specimens
C. Museum	(iii) Living plants
D. Herbarium	(iv) Living wild animals

a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(ii), B-(iv), C-(ii), D-(i) c) A-(iii), B-(iv), C-(i), D-(ii)
d) A-(i), B-(ii), C-(iv), D-(iii)

89. In the zoological name of fish *Catla catla*, the specific name is identical with the generic name, thus it is an example of

a) antonym b) tautonym c) synonym d) homonym

90. Select the correct option for biological names.

a) They are binomial b) They are descriptive c) They are universal d) All of these

91. The name of a plant order ends with

a) -aceae b) -ales c) -idae d) -ae

92. The plants growing in an area surrounded by a geographical or political boundary will be included in

a) fauna b) aquatic ecosystem c) flora d) terrestrial ecosystem

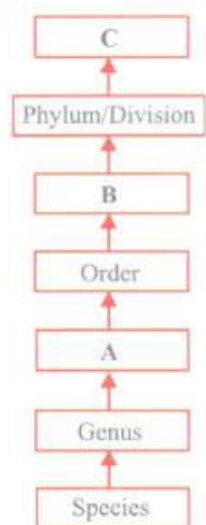
93. The given flow chart represents the hierarchy of various taxonomic categories. Identify the missing categories (A, B and C) and select the correct statements regarding these.

(i) A is the taxonomic category which contains a number of related genera.

(ii) Examples of category B are Monocotyledonae, Dicotyledonae, Mammalia, etc.

(iii) C represents the basic unit of taxonomic hierarchy.

(iv) Examples of category C are Fungi, Monera, Protista, etc.



a) (i) and (ii) b) (iii) and (iv) c) (i), (ii) and (iv) d) (i), (ii), (iii) and (iv)

94. Which one of the following is not a category?

a) Phylum b) Species c) Class d) Glumaceae

95. Match column I with column II and select the correct option from the codes given below

Column I	Column II
A. Binomial nomenclature	(i) Hippocrates
B. The Darwin of the 20 th century	(ii) Ernst Mayr
C. Father of botany	(iii) Linnaeus
D. Father of medicine	(iv) Theophrastus

- a) A-(iii), B-(ii), C-(iv), D-(i) b) A-(iii), B-(ii), C-(i), D-(iv) c) A-(i), B-(ii), C-(iii), D-(iv)
d) A-(ii), B-(iii), C(iv), D-(i)
96. In a taxonomic hierarchy, from species to kingdom
a) The number of common characters decrease b) Complexity decreases
c) More common characters are shared between members of higher taxa
d) Similarities between plants increas
97. Linnaeus described 5900 species of plants in his book _____ (1753) and 4326 species of animals in his book _____ (1758).
a) Philosophia Botanica, Genera Plantarum b) Historia Naturalis, Species Plantarum
c) Systema Naturae, Species Plantarum d) Species Plantarum, Systema Naturae
98. Which taxonomic aid gives comprehensive account of complete compiled information of a genus or family at a particular time?
a) Taxonomic key b) Herbarium c) Monograph d) All of these
99. Which of the following represents the correct sequence of various taxonomic categories?
a) Class-Phylum- Iribe-Order-Family-Genus- Species
b) Division-Class-Family-Tribe-Order-Genus- Species
c) Division-Class-Order-Family-Tribe-Genus- Species
d) Phylum-Order-Class-Tribe-Family-Genus-Species
100. Read the following statements and select the correct option.
Statement 1: Zoological parks are the places where wild animals are kept in protected environments under human care and which enable us to learn about their food habits and behaviour.
Statement 2: Adequate arrangements for the treatment, medication, regular check up and pathological investigations are absolutely necessary to be made for the health, care, and upkeep of the animals
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect
101. Floral features are commonly used for identification of angiosperms because
a) reproductive parts are more conservative b) flowers can be safely preserved
c) flowers are nice to work with d) flowers have various colours and scents.
102. Zoological parks
a) Have preserved animal specimens b) Have wild mammals only
c) Don't include birds d) Are useful in identification of animals

103. As we go from species to kingdom in a taxonomic hierarchy, the number of common characteristics
- a) will decrease b) will increase c) remain same d) may increase or decrease
104. Botanical gardens have
- a) Living plants and animals for reference b) Collection of living plants
 - c) Preserved plant specimens d) Living and preserved plants
105. Classification systems have many advantages. Which of the following is not a goal of biological classification?
- a) To depict convergent evolution b) To clarify relationships among organisms
 - c) To help us remember organisms and their traits d) To identify and name organisms
106. The main objective of plant taxonomy is
- a) to study the world's flora b) to provide a method for identification and nomenclature
 - c) to provide Latin 'scientific' names for every group of plants in the world
 - d) all of these.
107. Employment of hereditary principles in the improvement of human race is _____.
- a) Euthenics b) Eugenics c) Euphenics d) Ethnology
108. A couplet in a key is
- a) each statement in the key b) contrasting characters in a pair
 - c) rejection of a statement d) none of these.
109. Select the correctly written botanical/zoological name.
- a) Homo Sapiens b) Panthera tigris c) Pisum sativum d) Mangifera Indica
110. **Assertion:** Classification is necessary to study all living organisms.
Reason: In classification, individuals are grouped into categories.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
 - b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false. d) If both assertion and reason are false.
111. The main purpose for the classification of organisms is to
- a) study geography b) locate plants and animals
 - c) establish relationships amongst organisms d) study evolution
112. Mammals, animals and dogs represents
- a) same taxa at same levels b) same taxa at different levels
 - c) Different taxa at same level d) Different taxa at different levels
113. Genus is a group of similar and related
- a) classes b) phyla c) species d) orders.
114. Identify the correct sequence of taxonomi categories

- a) Species → phylum → class → kingdom b) Genus → species → order → kingdom
c) Species → Genus → order → class d) Division c → Family → order → e Genus
115. Read the following statements and select the correct option.
Statement 1: Reproduction cannot be considered as defining property of living organisms.
Statement 2: There are many living organisms which do not reproduce, e.g., mules, worker bees, etc.
a) Statement 1 is incorrect but statement 2 is correct
b) Both statements 1 and 2 are incorrect c) Both statements 1 and 2 are correct
d) Statement 1 is correct but statement 2 is incorrect.
116. Pedology is science of _____.
a) Earth b) Soil c) Diseases d) Pollution
117. In plants, growth occurs _____ whereas in animals, it occurs _____.
a) only upto a certain age, continuously b) continuously, only upto a certain age
c) continuously, continuously d) only upto a certain age, only upto a certain age
118. Which of the following represents defining feature of living organisms?
a) Growth b) Reproduction c) Metabolism d) Locomotion
119. Related genera belong to the same
a) species b) variety c) family d) breed
120. Two characteristics of growth are increase in mass and number of cells. Growth
a) occurs in animals by cell division throughout their life span
b) Is seen in plants by increase in number of cells upto a certain age
c)
And reproduction are mutually exclusive events in majority of higher animals and plants
d) Exhibited by non-living objects occurs from inside.
121. The living organisms can be unexceptionally distinguished from the non-living things on the basis of their ability for
a) Responsiveness to touch
b) Interaction with the environment and progressive evolution c) Reproduction
d) Growth and movement
122. Read the following statements with one or two blanks in each one of them.
(i) A genus containing more than one species is called _____ genus, e.g., _____
(ii) _____ is a collection of dried, pressed and preserved plants mounted on _____ sheets, properly labelled, systematically arranged and available for reference study.
(iii) Living fossils are ancient organisms persisting in modern times _____ gradual morphological changes.
(iv) A _____ is comprehensive treatise of a taxonomic group, generally, a genus or a family, providing all taxonomic data related to that group.
Which of the following correctly fills any two of the above statements?

- a) (i) monotypic, **Homo**; (ii) Herbarium, paper b) (ii) Manual, paper; (iii) with
 c) (iii) without; (iv) Monograph d) (i) polytypic, **Solanum**; (iv) Monograph

123. Study the following table which shows different organisms with their taxonomic categories.

Common name	Family	Order	Class	Phylum/Division
Man	Hominidae	Primata	Mammalia	A
Housefly	Muscidae	Diptera	B	Arthropoda
Mango	C	Sapindales	Dicotyledonae	Angiospermae
Wheat	Poaceae	Poales	D	Angiospermae

Select the correct option for A, B, C and D.

a)

A	B	C	D
Chordata	Insecta	Anacardiaceae	Monocotyledonae

b)

A	B	C	D
Animalia	Arachnida	Anacardiaceae	Monocotyledonae

c)

A	B	C	D
Chordata	Arachnida	Polygonaceae	Monocotyledonae

d)

A	B	C	D
Non-chordata	Insecta	Anacardiaceae	Dicotyledonae

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124. The term 'taxon' is used for

- a) the ranks of species and genus b) the ranks up to phylum
 c) the species epithet only d) any rank of taxonomic hierarchy

125. Organisms which obtain energy by the oxidation of reduced inorganic compounds are called _____.

- a) Photoautotrophs b) Chemoautotrophs c) Saprozoic d) Coproheterotrophs

126. Which is the odd one in the following series?

- a) sapiens b) americana c) rotundus d) **Hemidactylus**

127. It is much easier for a small animal to run uphill than for a large animal, because _____.

- a) It is easier to carry a small body weight.
 b) Smaller animals have a higher metabolic rate.
 c) Small animals have a lower O₂ requirement.
 d) The efficiency of muscles in large animals is less than in the small animals

128. Which one is exclusive characteristic of living beings?

- a) Increase in mass from inside b) Increase in mass both from outside and inside
 c) Perception of events happening in environment and their memory
 d) Isolated metabolic reactions occurring in vitro.

129. _____ is the branch of science dealing with identification, nomenclature and classification of organisms.
a) Morphology b) Anatomy c) Ecology d) Taxonomy
130. The taxon which includes related families is
a) Order b) Class c) Genus d) Division
131. Mark the Incorrect statement w.r.t. museums
a) Specimens are preserved in preservative b) insects are kept in insect boxes
c) Live animals are kept in protected environments
d) Specimens are also be preserved as dry specimens
132. Two organisms are present in the same class but not in the same family. They may belong to same
a) genus b) species c) variety d) order
133. _____ is a taxonomic aid which contains the actual account of habitat and distribution of plants of a given area and also provides the index to the plant species found in a particular area.
a) Flora b) Key c) Monograph d) Manual
134. **Assertion:** Monographs are useful in providing Information for identification of names of all genera only.
Reason: Monographs contain information of more than one taxon.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is d) If both assertion and reason are false.
135. Which of the following taxonomic categories includes all the others?
a) Family b) Order c) Genus d) Species
136. A true species consists of a population which is
a) sharing the same niche b) interbreeding c) feeding over the same food
d) geographically isolated
137. All living organisms are linked to one another because
a) they have common genetic material of the same type
b) they share common genetic material but to varying degrees
c) all have common cellular organisation d) all of the above.
138. Which one of the following statements is incorrect?
a) indica, tuberosum and lea represent the specific epithets.
b) Physalia, Apis and Helianthus represent the generic epithets
c) Monocotyledonae and Dicotyledonae are the two classes of division Angiospermae.
d) Phylum Chordata is the largest phylum of Kingdom Animalia.
139. Incorrect statement in relation to taxonomic key is

- a) Based on set of contrasting characters b) Generally analytical in nature
c) Same taxonomic key can be used for different taxonomic categories
d) Used for the identification of both plants and animals
140. The term 'systematics' refers to
a) identification and study of organ systems
b) identification and preservation of plants and animals
c) diversity of kinds of organisms and their relationship
d) study of habitats of organisms and their classification.
141. Taxon ending with a suffix ales
a) Species b) Order c) Taxonomy d) Classes
142. A taxonomic category refers to
a) the basic unit of classification b) a rank or level in a taxonomic hierarchy
c) a group of related organisms able to interbreed
d) a group of related organisms but unable to interbreed freely
143. Biological organisation starts with _____.
a) Cellular level b) Organismic level c) Atomic level
d) Submicroscopic molecular level
144. Catalogues
a) list or register containing names of all the species found in a particular place
b) booklet containing all the characters and their alternates which are helpful in identifying all the taxa
c) handy book containing instruction of a species
d) treatise having all informations about a particular taxon.
145. Information on anyone taxon is found in
a) Manuals b) Museums c) Herbarium d) Monographs
146. Which is less general in characters as compared to genus?
a) Family b) Class c) Division d) Species
147. **Assertion:** Cats and dogs have some similarities.
Reason: Cats and dogs belong to the same Family Canidae.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
148. What is true for individuals of same species?
a) Live in same niche b) Live in same habitat c) Interbreeding
d) Live in different habitat

149. The most convenient way for easy identification of plants and animals by applying diagnostic features is use of
a) botanical gardens b) herbaria c) museums d) taxonomic keys
150. ICBN is
a) International Code of Biological Naming
b) International Code for Botanical Nomenclature
c) International Class of Biological Nomenclature
d) International Classification of Biological Nomenclature
151. Study the following statements regarding significance of botanical gardens and select the incorrect one.
a) These help in growing important plants of local flora and keeping their record.
b) These help in providing living plant material for research work.
c) These help in growing and maintaining rare and endangered plants
d) None of these
152. Which of the following is a defining characteristic of living organisms?
a) Growth b) Ability to make sound c) Reproduction
d) Response to external stimuli
153. Which of the following groups consists of organisms which multiply by fragmentation?
a) Earthworm, Amoeba, fungi b) Earthworm, fungi, bacteria
c) Fungi, filamentous algae, protonema of mosses d) Amoeba, Hydra, bacteria
154. **Assertion:** System of providing name with two components is called binomial nomenclature.
Reason: Each name consists first of a specific name and second of a generic name.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
155. Which of the following statements is incorrect regarding the modern taxonomy?
a) It deals with biological species
b) It is based on the study of all types of variations in the species.
c) Speciation is considered to be static. d) It has a biosystematic concept.
156. In taxonomic hierarchy, cats are placed under the Genus
a) Felis b) Panthera c) Canis d) none of these
157. Select the incorrect statement with respect to the category, 'genus'.
a) It is a group or assemblage of related species.
b) A genus essentially possesses more than one number of species

- c)
Lion, Tiger, Leopard, Jaguar are closely related species which have been placed in the genus *Panthera* and are respectively named as *Panthera leo*, *P. tigris*, *P. pardus* and *P. onca*.
- d) *Solanum*, *Penicillium*, *Withania* and *Canis* are the examples of genera.
158. Which one of the following aspects is an exclusive characteristic of living things?
a) Isolated metabolic reactions occur in vitro b) Increase in mass from inside only
c) Perception of events happening in the environment and their memory
d) Increase in mass by accumulation of material both on surface as well as internally.
159. Phenetic classification is based on _____.
a) Sexual characteristics b) The ancestral lineage of existing organisms
c) Observable characteristics of existing organisms
d) Dendograms based on DNA characteristics
160. Quick referral systems in taxonomic studies are?
a) Botanical garden b) Herbaria c) Monograph d) manual
161. The ascending or descending arrangement of taxonomic categories is called as
a) classification b) taxonomy c) hierarchy d) key.
162. Most names in biological nomenclature of living organisms are taken from which language?
a) Hindi b) Latin c) German d) French
163. Which of the following characters are mainly considered for declaring a new plant species?
a) Characters of endosperm b) Anatomical characters c) Physiological characters
d) Floral characters
164. Museums have
a) Collection of living organisms b) Dried and preserved plant specimens only
c) Animals kept in their natural habitats d) Preserved plant and animals specimens
165. Study of all living organisms is made possible by this aspect of taxonomy
a) Identification b) Systematics c) Classification d) Nomenclature
166. Read the following statements regarding biological museums
(i) Biological museums are generally set up in educational institutes such as schools and colleges.
(ii) Museums have collections of preserved plant and animal specimens for study and reference.
(iii) Specimens are preserved in the containers or jars in preservative solutions.
(iv) Insects are preserved in insect boxes after collecting, killing and pinning.
(v) Larger animals like birds and mammals are usually stuffed and preserved.
(vi) Skeletons of mammals are not allowed to be kept in museums.
Which of the above statements is/are not correct?
a) (ii) and (iii) b) (i) and (vi) c) (v) only d) (vi) only

167. What is true for photolithotrops?

- a) Obtain energy from radiations and hydrogen from organic compounds
- b) Obtain energy from radiations and hydrogen from inorganic compounds
- c) Obtain energy from organic compounds
- d) Obtain energy from inorganic compounds

168. Nomenclature is governed by certain universal rules. Which of the following is contrary to the rules of nomenclature?

a)

The first word in a biological name represents the genus name and the second is a specific epithet.

b) The names are written in Latin and are italicized.

c) When written by hand, the names are to be underlined.

d) Biological names can be written in any language.

169. Which one of the following animals is correctly matched with its particular taxonomic category?

- a) Tiger - tigris, species b) Cuttlefish - Mollusca, class c) Humans - primate, family
- d) Housefly - Musca, order

170. Which one of the following is common to multicellular fungi, filamentous algae and protonema of mosses?

- a) Mode of Nutrition b) Multiplication by fragmentation c) Diplontic life cycle
- d) Members of kingdom Plantae

171. Which of the following options represents the correct classification for the given animal?



a)

Phylum	Class	Order	Family	Genus	Species
Chordata	Vertebrata	Chiroptera	Felidae	Canis	tigris

b)

Phylum	Class	Order	Family	Genus	Species
Chordata	Mammalia	Carnivora	Felidae	Panthera	tigris

c)

Phylum	Class	Order	Family	Genus	Species
Vertebrata	Mammalia	Carnivora	Felidae	Panthera	tigris

d)

Phylum	Class	Order	Family	Genus	Species
Mammalia	Felidae	Carnivora	Felidae	Panthera	leo

172. Match the items given in column I with those in column II and select the correct option given below:

Column I	Column II
A. Herbarium	(i) It is a place having a collection of preserved plants and animals.

B. Key	(ii) A list that enumerates methodically all the species found in an area with brief description.
C. Museum	(iii) Is a place where dried and pressed plants specimens mounted on sheets are kept
D. Catalogue	(iv) A booklet containing a list of characters and their alternates which are helpful in identification of various taxa.

a)	b)	c)	d)
A B C D	A B C D	A B C D	A B C D
(i)(iv)(iii)(ii)	(iii)(iv)(i)(ii)	(ii)(iv)(iii)(i)	(iii)(ii)(i)(iv)

173. A 'type' is one particular specimen (or a group of specimens) of an organism to which the scientific name of that organism is formally attached. Match column I (type) with column II (description) and select the correct option from the codes given below

Column I	Column II
A. Holotype	(i) A specimen cited with original description other than the holotype or isotype
B. Isotype	(ii) A duplicate of the holotype
C. Paratype	(iii) A specimen designated in the original description
D. Lectotype	(iv) A specimen selected from original material to serve as nomenclatural type when the holotype was not designated

- a) A-(iii), B-(ii), C-(i), D-(iv) b) A-(iii), B-(i), C-(ii), D-(iv) c) A-(iii), B-(ii), C-(iv), D-(i)
d) A-(iii), B-(iv), C-(i), D-(ii)

174. **Assertion:** Species is a group of individuals with fundamental similarities.

Reason: Indica, leo, tuberosum represent such group of individuals.

- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

175. Match the following

Column I	Column II
(a) Musca	(i) Anacardiaceae, Sapindales
(b) Homo	(ii) Hominidae, Primata
(c) Triticum	(iii) Poaceae, Poales
(d) Mangifera	(iv) Diptera, Insecta

- a) a(iv), b(i), c(ii), d(iii) b) a(iv), b(iii), c(i), d(ii) c) a(iv), b(ii), c(iii), d(i)
d) a(ii), b(iv), c(i), d(iii)

176. **Assertion:** Keys are analytical in nature.

Reason: Keys are based on couplet.

- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
177. Which two of the below given points are known as the twin characteristics of growth?
- (i) Increase in mass
(ii) Increase in number of individuals
(iii) Cellular organisation
(iv) Cellular differentiation
- a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (iii) and (iv)
178. Living organisms show all the following properties, except
- a) Self replication b) Evolution c) Self regulation
d) High specific gravity and extrinsic growth
179. Standardization of names helps in
- a) Providing one name for each organism
b)
Enabling people to arrive at the same name for a particular organism all over the world
c)
Ensuring that a name for an organism has not been used for any other known organism
d) All of these
180. A. Families are characterized on basis of both vegetative and reproductive features of plants
B. Polymoniales includes Solanaceae and Convolvulaceae mainly on the basis of floral characters
- a) Only A is correct b) Only B is correct c) Both A & B correct
d) Both A & B are incorrect
181. Select the correct classification for the given plant.



a)

Division	Class	Order	Family
Plantae	Angiospermae	Asterales	Asteraceae

b)

Division	Class	Order	Family
Angiospermae	Dicotyledonae	Asterales	Asteraceae

c)

Division	Class	Order	Family
Angiospermae	Dicotyledonae	Polymoniales	Compositae

d)

Division	Class	Order	Family
Dicotyledonae	Asteraceae	Asterales	Compositae

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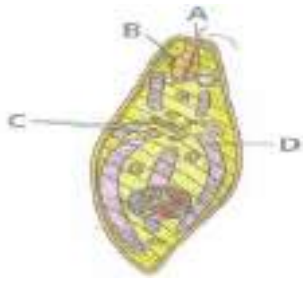
1. **Assertion:** Two kingdom classification was insufficient
Reason: Majority of organisms did not fall into either of the categories in two kingdom classification.
 - a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false.
 - d) If both assertion and reason are false.
2. Mark the incorrect match
 - a) Amoeboid protozoan -Gonyaulax
 - b) Flagellated protozoan -Trypanosoma
 - c) Ciliated protozoan -Paramoecium
 - d) Sporozoan -Plasmodium
3. Ciliates differ from all other protozoans in :
 - a) Using pseudopodia for capturing prey
 - b) Having a contractile vacuole for removing excess water.
 - c) Using flagella for locomotion
 - d) Having two types of nuclei
4. Which fungal disease spreads by seed and flowers?
 - a) Loose smut of wheat
 - b) Corn stunt
 - c) Covered smut of barley
 - d) Soft rot of potato
5. There exists a close association between the alga and the fungus within a lichen. The fungus _____.
 - a) Provides protection, anchorage and absorption for the alga
 - b) Provides food for the alga
 - c) Fixes the atmospheric nitrogen for the alga
 - d) Releases oxygen for the alga
6. Kingdom Plantae includes
 - a) algae and bryophytes
 - b) pteridophytes and gymnosperms
 - c) angiosperms
 - d) all of these.
7. Flagellation in Euglena is
 - a) Uniflagellation
 - b) Isokont and whiplash type
 - c) Heterokont and whiplash type
 - d) Heterokont and stichonematic
8. Some hyperthermophilic organisms that grow in highly acidic (pH = 2) habitats belong to the two groups.
 - a) Liverworts and yeasts
 - b) Eubacteria and Archaea
 - c) Cyanobacteria and diatoms
 - d) Protists and mosses
9. Read the following statements regarding methanogens and select the correct option.
 - (i) They are included in the group Archaeobacteria.
 - (ii) They are responsible for the production of biogas in gobar gas plants.

- (iii) They live in hot sulphur springs.
(iv) They are strictly anaerobic.
a) Statements (i) and (ii) are correct b) Statements (i), (ii) and (iv) are correct
c) Statements (ii), (iii) and (iv) are correct d) All statements are correct.
10. Which of the following organisms possesses characteristics of both a plant and an animal?
a) Bacteria b) Mycoplasma c) Euglena d) Paramecium
11. Which pair of the following belongs to Basidiomycetes?
a) Puffballs and Claviceps b) Peziza and stink horns c) Morchella and mushrooms
d) Bird's nest fungi and puffballs.
12. Entamoeba coli causes _____.
a) Pyorrhoea b) Diarrhoea c) Dysentery d) None of these
13. Match column I with column II and select the correct option from the given codes.
- | Column I | Column II |
|------------------------------|----------------------|
| A. Chief producers in oceans | (i) Euglenoids |
| B. Red tides | (ii) Diatoms |
| C. Mixotrophic nutrition | (iii) Slime moulds |
| D. Plasmodium | (iv) Dinoflagellates |
- a) A-(ii), B-(iv), C-(i), D-(iii) b) A-(ii), B-(iv), C-(iii), D-(i) c) A-(ii), B-(iii), C-(i), D-(iv)
d) A-(i), B-(iv), C-(iii), D-(ii)
14. Cauliflower mosaic virus contains _____.
a) ss RNA b) ds RNA c) ds DNA d) ss DNA
15. White rust disease is caused by _____.
a) Claviceps b) Alternaria c) Phytophthora d) Albugo Candida
16. The structures that help some bacteria to attach to rocks and / or host tissues are:
a) Fimbriae b) Mesosomes c) Holdfast d) Rhizoids
17. Yeast (*Saccharomyces cerevisiae*) is used in the industrial production of _____.
a) Citric acid b) Tetracycline c) Ethanol d) Butanol
18. Archaeobacteria differs from eubacteria in :
a) Cell Membrane structure b) Mode of nutrition c) Cell shape d) Mode of reproduction
19. Ustilago caused plant diseases are called smuts because _____.
a) They parasitise cereals b) Mycelium is black c) They develop sooty masses of spores
d) Affected parts become completely black
20. Which one of the following does not differ in *E. coli* and *Chlamydomonas*?
a) Cell wall b) Cell membrane c) Ribosomes d) Chromosomal organization
21. In lichen, the fungus provides:
a) Protection, anchorage and absorption for alga b) Food for alga c) Oxygen for alga
d) Fixes nitrogen for alga
22. **Assertion:** Cell wall of Chrysophytes are indestructible.
Reason: Cell walls of Chrysophytes have layer of magnesium pectate embedded in it.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false. d) If both assertion and reason are false.
23. Read the given statements about lichens and select the incorrect ones.
- (i) They represent an example of commensalism.
 - (ii) Algal partner obtains water and mineral salts from the fungus and the fungal partner obtains food prepared by the alga.
 - (iii) These do not grow in polluted areas.
 - (iv) The mycobiont is usually an Ascomycetes or a Basidiomycetes.
 - (v) The phycobiont is mostly a green alga or a cyanobacterium.
 - (vi) These constitute the pioneer community in case of hydrosere.
- a) (i) and (ii) b) (v) and (vi) c) (i) and (vi) d) (i), (v) and (vi)
24. **Assertion:** The protoplasm of plasmodial slime mould is considered purest in the world.
Reason: Protoplasm of Plasmodium is differentiated into an outer enucleated and central nucleated portions.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
25. Siliceous frustules of diatoms being indestructible, piled up at the bottom of ocean and formed a thick bed over billions of years. Such a thick bed is known as
- a) red sea b) diatomaceous earth c) pseudorocks d) red tides.
26. Select the pair that consists of plant or animal bacterial diseases.
- a) Cholera and typhoid b) Citrus canker and crown gall c) Malaria and dengue
d) Both (a) and (b)
27. Which of the following are most suitable indicators of SO_2 pollution in the environment?
- a) Conifers b) Algae c) Fungi d) Lichens
28. Which of the following kingdoms has no well-defined boundaries?
- a) Monera b) Protista c) Fungi d) None of these
29. Read the following statements and select the correct option.
- Statement 1 : Euglena can be considered as a plant due to the presence of chlorophyll.
Statement 2 : Euglena cannot be classified on the basis of two kingdom system of classification.
- a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect
30. Coenocytic mycelium is
- a) uninucleate, septate b) multinucleate, septate c) multinucleate, septate
d) both (b) and (c).
31. The five kingdom classification was proposed by
- a) R.H. Whittaker b) C. Linnaeus c) A. Roxberg d) Virchow.
32. Malignant tertian malarial is caused by _____.
- a) Plasmodium falciparum b) P.vivax c) P. ovale d) P. malariae

33. Organisms living in salty areas are called as
a) methanogens b) halophiles c) heliophytes d) thermoacidophiles.
34. _____ bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for ATP production. They play an important role in recycling of nutrients (N, P, Fe, S etc.).
a) Photosynthetic autotrophic b) Chemosynthetic autotrophic c) Parasitic
d) Saprophytic
35. Five kingdom system of classification suggested by R.H. Whittaker is not based on:
a) Presence or absence of a well defined nucleus b) Mode of reproduction
c) Mode of nutrition. d) Complexity of body organisation.
36. A few organisms are known to grow and multiply- at temperatures of 100- 105°C They belong to _____.
a) Marine archaebacteria b) Thermophilic sulphur bacteria
c) Hot-spring blue-green algae (cyanobacteria) d) Thermophilic, subaerial fungi
37. Contagium vivum fluidum was proposed by
a) D. J. Ivanowsky b) M. W. Beijerinck c) Stanley d) Robert Hooke.
38. Read the following statements regarding euglenoids and select the incorrect ones
(i) These are mostly freshwater organisms found in stagnant water.
(ii) Their body is covered by a protein rich layer called pellicle which makes their body flexible.
(iii) They are photosynthetic in the presence of sunlight but become heterotrophs in the absence of sunlight.
(iv) They usually possess two flagella, one long and one short.
(v) Euglenoids are multicellular ciliate protists.
a) (i) and (v) b) (iv) and (v) c) (iii) only d) (v) only
39. Excretion in Amoeba occurs through _____.
a) Lobopodia b) Uroid Portion c) Plasma membrane d) Contractile vacuole
40. Who crystallised and isolated viruses for the first time?
a) W.M. Stanley b) K.M. Smith c) D. Ivanowski d) F.C. Bawden
41. The motile bacteria are able to move by :
a) Fimbriae b) Flagella c) Cilia d) Pili
42. Photosynthetic bacteria have pigments in _____.
a) Leucoplasts b) Chloroplasts c) Chromoplasts d) Chromatophores
43. Single-celled eukaryotes are included in
a) Monera b) Protista c) Fungi d) Archaea
44. To form fruiting bodies for spores formation, plasmodium stage of slime moulds undergoes
a) Aggregation under favourable conditions
b) Differentiation under unfavourable conditions
c) Chemotactic movement to form motile gametes
d) Differentiation under favourable conditions

45. Study the given figure showing structure of Euglena and select the option that correctly identifies A, B, C and D.



a)

A	B	C	D
Cytostome	Photoreceptor	Paramylum bodies	Myonemes

b)

A	B	C	D
Contractile vacuole	Photoreceptor	Paramylum bodies	Chloroplast

c)

A	B	C	D
Cytostome	Stigma	Paramylum bodies	Chloroplast

d)

A	B	C	D
Cytostome	Stigma	Myonemes	Chloroplast

46. **Assertion:** Archaeobacteria are able to survive in harsh habitats.
Reason: Presence of peptidoglycan in cell wall help archaeobacteria to survive in extreme conditions.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
47. **Assertion:** Deuteromycetes is known as fungi imperfect.
Reason: In Deuteromycetes, only the asexual phase is known.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
48. Archaeobacteria can survive in extreme conditions due to
 a) Different metabolism b) Similar cell membrane as eubacteria
 c) Different cell wall structure d) Diverse types of nutrition
49. Which is wrong for viroids?
 a) Their RNA is of high molecular weight b) They lack a protein coat
 c) They are smaller than viruses d) They cause infections
50. Which of these is a defining character of plants?
 a) Autotrophic nature b) Eukaryotic cell structure c) Cellulosic cell wall
 d) Aerobic respiration
51. Haploid sexual spore produced exogenously is
 a) Ascospore b) Oospore c) Basidiospore d) Zygosporangium
52. Which of the following statements about Euglena is correct?

- a) Euglena is a flagellate organism.
b) Euglena when placed in continuous darkness, loses its photosynthetic activity and dies.
c) The pigments of Euglena are quite different from those of green plants.
d) Euglena is a marine protist.
53. Select the mismatched pair
a) W.M. Stanley - Viruses could be crystallised b) D.J. Ivanowsky - Coined term virus
c) M.W Beijerinck - Extract of the infected plants of tobacco cause infection in healthy plants
d) None of these
54. Tobacco mosaic virus is a tubular filament of size _____.
a) 700 x 30 nm b) 300 x 10 nm c) 300 x 5 nm d) 300 x 20 nm
55. Mer karyogamy followed by meiosis, spores are produced exogenously in :
a) Agaricus b) Alternaria c) Neurospora d) Saccharomyces.
56. **Assertion:** Pasteur coined **Contagium Vivum Fluidum**.
Reason: Pasteur found that virus infected plant of tobacco can cause infection in healthy plant.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
57. Which of the following statement is incorrect?
a) Viruses are obligate parasites. b) Infective constituent in viruses is the protein coat.
c) Prions consist of abnormally folded proteins. d) Viroids lack a protein coat.
58. Sexual reproduction in fungi occurs by all of the following except
a) oospores b) ascospores c) zoospores d) basidiospores.
59. Read the following statements and select the correct option
Statement 1: Almost all bacteria possess lipoproteinaceous plasma membrane.
Statement 2: The plasma membrane of archaebacteria as well as eubacteria have same type of lipids.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
60. The infective state of malarial parasite Plasmodium that enters human body is _____.
a) Merozoite b) Sporozoite c) Trophozoite d) Minuta form
61. Fungi show a sexual reproduction by all of the following kinds of spores except.
a) conidia b) oospores c) sporangiospore d) zoospores.
62. The major criterion of five kingdom system of classification is
a) Complexity of cell structure b) Mode of nutrition c) Complexity of body organisation
d) Ecological
63. Some members are saprophytes or parasites whereas a large number of members are decomposers of litter and help in nutrient cycling in case of

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a) Phycomycetes b) Deuteromycetes c) Ascomycetes d) Basidiomycetes

64. Naked cytoplasm, multinucleated and saprophytic are the characteristics of

a) monerans b) protists c) fungi d) slime moulds.

65. Bacteria are grouped under four categories according to their shape. Study the given figures and select the correct option regarding this.



a)

A	B	C	D
Cocci	Bacilli	Spirilla	Vibrio

b)

A	B	C	D
Spirilla	Bacilli	Vibrio	Cocci

c)

A	B	C	D
Bacilli	Spirilla	Vibrio	Cocci

d)

A	B	C	D
Bacilli	Spirilla	Cocci	Vibrio

66. Bacterial leaf blight of rice is caused by a species of _____.

a) Xanthomonas b) Pseudomonas c) Alternaria d) Erwinia

67. The primitive prokaryotes responsible for the production of biogas from the dung of ruminant animals include the :

a) Eubacteria b) Halophiles c) Thermoacidophiles d) Methanogens

68. In Penicillium, the asexual reproduction takes place by

a) ascospores b) aplanospores c) sporangiospores d) conidiospores.

69. Genetic information in Paramecium is contained in _____.

a) Micronucleus b) Macronucleus c) Both (a) and (b) d) Mitochondria

70. Which of the following statements regarding viruses are correct?

- (i) These are cellular, infectious, nucleoprotein particles.
- (ii) They can be grown in culture medium.
- (iii) Genetic material is either DNA or RNA, but never both.
- (iv) They can be crystallised.

a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)

71. Which of the following options incorrectly distinguishes the Kingdoms Monera and Protista?

a)

Monera	Protista
Includes unicellular prokaryotes	Includes multicellular eukaryotes

b)

Monera	Protista
Membrane bound cell organelles are absent	Membrane bound cell organelles are present

c)

Monera	Protista
Cell wall when present, made up of peptidoglycans	Cell wall, if present, contains cellulose

d)

Monera	Protista
Flagella, when present, comprise of protein flagellin	Flagella and cilia when present, made up of protein tubulin

72. Temperature tolerance of thermal blue-green algae is due to _____.
 a) Cell wall structure b) Cell organisation c) Mitochondrial structure
 d) Homopolar bonds in their proteins
73. Term used for the closed ascocarp is
 a) apothecium b) amphithecium c) endothecium d) cleistothecium.
74. African sleeping sickness is due to _____.
 a) Plasmodium vivax transmitted by tse-tse fly
 b) Trypanosoma lewisi transmitted by bed bug
 c) Trypanosoma gambiense transmitted by Glossina palpalis
 d) Entamoeba gingivalis spread by house fly
75. Which one of the following statements about viruses is correct?
 a) Viruses possess their own metabolic system b) Viruses contain either DNA or RNA
 c) Viruses are facultative parasites d) Viruses are readily killed by antibiotics
76. In Whittaker's five kingdom system of classification, eukaryotes are distributed among
 a) two kingdoms b) three kingdoms c) four kingdoms d) all the five kingdoms
77. An association between roots of higher plants and fungi is called
 a) lichen b) fern c) mycorrhiza d) BGA
78. Influenza virus has _____.
 a) DNA b) RNA c) Both (a) and (b) d) Only proteins and no nucleic acids
79. Causal organisms of sleeping sickness and kala-azar belong to which of the following groups of protozoan protists?
 a) Amoeboid protozoans b) Flagellated protozoans c) Ciliated protozoans
 d) Sporozoans
80. The imperfect fungi which are decomposers of litter and help in mineral cycling belong to :
 a) Ascomycetes b) Deuteromycetes c) Basidiomycetes d) Phycomycetes.
81. Which one of the following statements about mycoplasma is wrong?
 a) They are pleomorphic, b) They are sensitive to penicillin,
 c) They cause diseases in plants, d) They are also called PPLO.
82. Main component of the cell wall of fungi is
 a) cellulose b) pectin c) chitin d) dextrin.
83. Maximum nutritional diversity is found in the group
 a) Monera b) Plantae c) Fungi d) Animalia
84. Cyanobacteria are also referred to as :
 a) Protists b) Golden algae c) Slime moulds d) Blue green algae
85. The correct placement of cyanobacteria according to whittaker system of classification is in

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- a) Fungi and monera b) Monera only c) monera and protista d) Fungi and plantae
86. _____ is a unicellular fungus
a) Yeast b) Rust c) Smut d) Bread mould
87. Organisms called methanogens are most abundant in a _____.
a) Sulphur rock b) Cattle yard c) Polluted stream d) Hot spring
88. The given statements describe a group of organisms.
(i) Instead of a cell wall they have a protein rich pellicle making their body flexible.
(ii) They have 2 flagella, a short and a long one.
(iii) They show mixotrophic nutrition.
(iv) They are connecting link between plants and animals.
Which of the following groups is referred to here?
a) Dinoflagellates b) Slime moulds c) Desmids and diatoms d) Euglenoids
89. Plant decomposers are _____.
a) Monera and fungi b) Fungi and plants c) Protista and animalia
d) Animalia and monera
90. Sexual reproduction in fungi is carried out by the fusion of compatible nuclei from two parents at a definite stage in the life cycle. Identify the different types of sexual reproduction occurring in fungi from the given figures and select the correct option.

p
Q
R
S

a)

P	Q	R	S	T
Heterogamy	Gametangial contact	Gametangial copulation	Spermatisation	Somatogamy

b)

P	Q	R	S	T
Plano-gametic copulation	Gametangial copulation	Gametangial contact	Spermatogamy	Heterothallism

c)

P	Q	R	S	T
Plano gametic copulation	Gametangial contact	Gametangial copulation	Spermatisation	Somatogamy

d)

P	Q	R	S	T
Heterogamy	Oogamy	Planogametic copulation	Conidiospores	Hetero thallism

91. Read the following statements and select the option arbovirus. which identifies the incorrect ones.
- Potato spindle tuber disease and **Chrysanthemum** stunt disease are caused by viroids.
 - T₄ bacteriophage exhibits lytic cycle.
 - Retroviruses have two copies of ssRNA.
 - Interferons which prevent viral multiplication are glycolipid particles.
- a) (ii) and (iii) b) (i) and (iv) c) (iii) only d) (iv) only
92. a. Asexual spores generally absent
 b. Vegetative reproduction commonly by fragmentation
 c. Sex organs absent but sexual reproduction present
 d. Used extensively in genetic and biochemical
 e. Site of karyogamy and meiosis in asus
 f. Basidium produces endogenous sexual spores
 g. Morels and truffles are edible members
- Out of these given features, which ones are associated with basidiomycetes?
- a) a, c and f b) a, b and c c) c, d and f d) f and g only
93. Which statement is correct for bacterial transduction?
- Transfer of some genes from one bacteria to another bacteria through virus.
 - Transfer of genes from one bacteria to another bacteria by conjugation.
 - Bacteria obtains its DNA directly.
 - Bacteria obtains its DNA from other external source.
94. Which of the following are likely to be present in deep sea water?
- a) Eubacteria b) Blue-green algae c) Saprophytic fungi d) Archaeobacteria
95. The term algae is applied to the cyanobacteria on the basis of
- a) Cell wall b) Photosynthetic activity c) Flagella d) Sexual reproduction
96. Which one of the following organisms is not a eukaryote?
- a) Paramecium caudatum b) Escherichia coli c) Euglena viridis d) Amoeba proteus
97. Which one of the following is an incorrect pair?
- Louis Pasteur - Coined the term 'virus'
 - Beijerinck - Contagium vivum fluidum
 - Ivanovsky - Discovered retroviruses
 - Stanley - Crystallised TMV
98. Pick up the wrong statement.
- Nuclear numbrane is present is Monera
 - Cell wall is absent in Animalia
 - Protista have photosynthetic and heterotrophic modes of nutrition
 - Some fungi are edible.
99. The guts of cow and buffalo possess:
- a) Cyanobacteria b) Fucus spp. c) Chiarella spp. d) Methanogen

100. Which of the following is not correctly matched?
a) Root knot disease - *Meloidogyne javanica* b) Smut of bajra - *Tolysporium penicillariae*
c) Covered smut of barley - *Ustilago nuda* d) Late blight of potato - *Phytophthora infestans*
101. Viruses have:
a) DNA enclosed in a protein coat b) Prokaryotic nucleus c) Single chromosome
d) Both DNA and RNA
102. The most abundant prokaryotes helpful to humans in making curd from milk and in production of antibiotics are the ones categorised as:
a) Cyanobacteria b) Archaeobacteria c) Chemosynthetic autotrophs
d) Heterotrophic bacteria
103. How many organisms in the list given below are autotrophs?
Lactobacillus, *Nostoc*, *Chara*, *Nitrosomonas*, *Nitrobacter*, *Streptomyces*, *Sacharomyces*, *Trypanosoma*, *Porphyra*, *Wolffia*
a) Four b) Five c) Six d) Three
104. Select the incorrect match.
a) Morels and truffles - *Phycomycetes* b) Puffballs and toad stools - *Basidiomycetes*
c) Early blight of potato - *Alternaria solani* d) Late blight of potato - *Phytophthora infestans*
105. In five kingdom system, the main basis of classification is _____.
a) Structure of nucleus b) Mode of nutrition c) Structure of cell wall
d) Asexual reproduction
106. Which one of the following set of items in the option (a-d) are correctly categorized with one exception in it?
- a)
- | Items | Category | Exception |
|---------------|-------------|-----------|
| UAA, UAG, UGA | Stop codons | UAG |
- b)
- | Items | Category | Exception |
|-------------------------|-----------------------|-----------|
| Kangaroo, Koala, Wombat | Australian marsupials | Wombat |
- c)
- | Items | Category | Exception |
|----------------------------------|-----------|-----------|
| Plasmodium, Cuscuta, Trypanosoma | Protozoan | Cuscuta |
- d)
- | Items | Category | Exception |
|--------------------------------|-------------------|------------|
| Typhoid, pneumonia, diphtheria | Bacteria diseases | diphtheria |
107. In which of the animals dimorphic nucleus is found?
a) *Amoeba proteus* b) *Trypanosoma gambiense* c) *Plasmodium vivax*
d) *Paramecium caudatum*
108. Anoxygenic photosynthesis is characteristic of
a) *Rhodospirillum* b) *Spirogyra* c) *Chlamydomonas* d) *Ulva*
109. Membrane-bound organelles are absent in :
a) *Plasmodium* b) *Saccharomyces* c) *Streptococcus* d) *Chlamydomonas*

110. Chemosynthetic autotrophs are included in how many kingdoms according to Whittaker's system?
a) Four b) Three c) Two d) One
111. Eukaryotic, achlorophyllous and heterotrophic organisms are grouped under which of the following kingdoms?
a) Monera b) Protista c) Fungi d) Plantae
112. The thalloid body of a slime mould (Myxomycetes) is known as _____.
a) Plasmodium b) Fruiting body c) Mycelium d) Protonema
113. Which of the following components provides sticky character to the bacterial cell?
a) Nuclear membrane b) Plasma membrane c) Glycocalyx d) Cell wall
114. In five kingdom classification, Chlamydomonas and Chlorella have been included in :
a) Protista b) Monera c) Plantae d) Algae
115. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Plant virus	(i) Kuru disease
B. Animal virus	(ii) Potato spindle tuber
C. Viroids	(iii) Polio
D. Prions	(iv) Tobacco mosaic

- a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(iv), B-(iii), C-(ii), D-(i) c) A-(iii), B-(iv), C-(i), D-(ii)
d) A-(ii), B-(iii), C-(iv), D-(i)
116. **Assertion:** Sporozoans may have silica shells on their surface.
Reason: Shells of sporozoans help in protection from acidic environment of the host.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
117. All eukaryotic unicellular organisms belong to
a) Monera b) Protista c) Fungi d) Bacteria.
118. Which one is an incorrectly matched pair?
a) Phycomycetes - Mucor, Albugo b) Ascomycetes - Penicillium, Aspergillus
c) Basidiomycetes - Puccinia, Agaricus d) Deuteromycetes - Ustilago, Colletotrichum
119. The chemical compounds produced by the host plants to protect themselves against fungal infection is _____.
a) Phytotoxin b) Pathogen c) Phytoalexins d) Hormone
120. Bacterial cell divides every one minute. It takes 15 minutes a cup to be filled one-fourth. How much time will it take to fill the cup full?
a) 30 minutes b) 45 minutes c) 60 minutes d) 17 minutes
121. In an experiment common Tobacco Mosaic Virus (TMV) and its mutant strain 'HR' were used to prepare hybrid particles with 'HR' nucleic acid and 'TMV' protein coat. These hybrids were mixed with antibodies against 'HR' strains. If this mixture is applied to plant materials, it will result in

- a) loss of infectivity of virus particles due to inactivation of nucleic acids
 - b) loss of infectivity due to inactivation of protein coat
 - c) intact infectivity because only coat is neutralised
 - d) unchanged infectivity because neither nucleic acid nor protein coat is neutralised.
122. What is wrong about mycoplasma?
- a) They are called PPLO b) They are pleomorphic c) They are sensitive to penicillin
 - d) They produce diseases in plants
123. Choose the wrong statements
- a) Neurospora is used in the study of biochemical genetics.
 - b) Morels and truffles are poisonous mushrooms.
 - c) Yeast is unicellular and useful in fermentation.
 - d) Penicillium is multicellular and produces antibiotics.
124. Which of the following is not a viral disease of plants?
- a) Red rot of sugarcane b) Tobacco mosaic disease c) Leaf curl of tomato
 - d) Tristeza disease of citrus
125. Virus envelope is known as :
- a) Capsid b) Virion c) Nucleoprotein d) Core
126. In which group of organisms the cell walls form two thin overlapping shells which fit together?.
- a) Chrysophytes b) Euglenoids c) Dinoflagellates d) Slime moulds
127. Macro and micronucleus are the characteristic feature of _____ .
- a) Paramecium and Vorticella b) Opalina and Nicotrichus c) Hydra and Ballantidium
 - d) Vorticella and Nicotrichus
128. One of the major components of cell wall of most fungi is _____ .
- a) Chitin b) Peptidoglycan c) Cellulose d) Hemicellulose,
129. Which of the following statements is incorrect?
- a) Claviceps is a source of many alkaloids and LSD.
 - b) Conidia are produced exogenously and ascospores endogenously
 - c) Yeasts have filamentous bodies with long thread-like hyphae.
 - d) Morels and truffles are edible delicacies.
130. Dikaryophase is a specific characteristic of
- a) all Fungi b) Phycomycetes and Ascomycetes c) Basidiomycetes and Deuteromycetes
 - d) Ascomycetes and Basidiomycetes.
131. In the five-kingdom classification, Chlamydomonas and Chlorella have been included in _____ .
- a) Protista b) Algae c) Plantae d) Monera
132. Thermococcus, Methanococcus and Methanobacterium exemplify.
- a) Bacteria that contain a cytoskeleton and ribosomes
 - b) Archaeobacteria that lack any histones resembling those found in eukaryotes but whose DNA is negatively supercoiled.

c) Archaeobacteria that contain protein homologous to eukaryotic core histones.

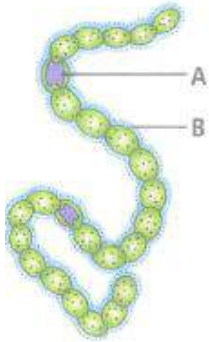
d)

Bacteria whose DNA is relaxed or positively supercoiled but which have a cytoskeleton as well as mitochondria.

133. Viruses that infect bacteria, multiply and cause their lysis, are called _____.

a) Lysozymes b) Lipolytic c) Lytic d) Lysogenic

134. Given figure is of filamentous blue green alga **Nostoc**. Identify the parts marked as A and B and select the correct option.



a)

A	B
Heterocyst	Mucilaginous sheath

b)

A	B
Vegetative cell	Mucilaginous sheath

c)

A	B
Trichomes	Cell wall

d)

A	B
Mucilaginous sheath	Heterocyst

135. **Assertion:** Chemosynthetic autotrophic bacteria oxidise various inorganic substances.

Reason: Energy released during oxidation is used in ATP production.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

136. Which of the following statements regarding the Class Phycomycetes is correct?

a)

These are found in aquatic habitats and on decaying wood in moist and damp places or as obligate parasites on plants.

b) Mycelium in these fungi is aseptate and coenocytic

c) Asexual reproduction occurs by motile zoospores and by non-motile aplanospores.

d) All of these

137. _____ are important decomposers that cause decay and decomposition of dead bodies of plants and animals.

a) Saprophytic bacteria b) Saprotrophic fungi c) Plants, like Sarracenia

d) Both (a) and (b)

138. Read the given statements that describe certain infectious particle.

(i) It was discovered by T.O. Diener and was found to be smaller than viruses.

(ii) It causes potato spindle tuber disease.

(iii) It is a free RNA particle which lacks the protein coat.

(iv) It has low molecular weight RNA as genetic material.

Which of the following is referred to here?

a) Virus b) Viroid c) Virion d) Bacteriophage

139. T.O. Diener discovered:

a) Free infectious protein b) Free infectious DNA c) Free infectious RNA
d) Bacteriophage

140. The main role of bacteria in the carbon cycle involves _____.

a) Photosynthesis b) Chemosynthesis c) Digestion or break down of organic compounds
d) Assimilation of nitrogenous compounds

141. Which one of the following is not true about lichens?

a) Their body is composed of both algal and fungal cells
b) Some form food for reindeers in Arctic regions
c) Some species can be used as pollution indicators
d) These grow very fast at the rate of about 2cm per year

142. The vector for sleeping sickness is _____.

a) House fly b) tse-tse fly c) Sand fly d) Fruit fly

143. Which one of the following is wrong for fungi?

a) They are both unicellular and multicellular b) They are eukaryotic
c) All fungi possess a purely cellulosic cell wall d) They are heterotrophic

144. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Phycomycetes	(i). Sac fungi
B. Ascomycetes	(ii). Algal fungi
C. Basidiomycetes	(iii) Fungi imperfecti
D. Deuteromycetes	(iv) Club fungi

a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(ii), B-(iv), C-(i), D-(iii) c) A-(iv), B-(i), C-(ii), D-(iii)
d) A-(iv), B-(iii), C-(ii), D-(i)

145. Chrysophytes are

a) planktons b) nektons c) benthic organisms d) rooted submerged.

146. Which among the following is not a prokaryote?

a) Nostoc b) Mycobacterium c) Saccharomyces d) Oscillatoria.

147. Select the wrong statement.

a) Bacterial cell wall is made up of peptidoglycan.
b) Pili and fimbriae are mainly involved in motility of bacterial cells.
c) Cyanobacteria lack flagellated cells. d) Mycoplasma is a wall-less micro-organism.

148. **Assertion:** Virus is an obligate parasite.

Reason: Virus is host specific.

a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

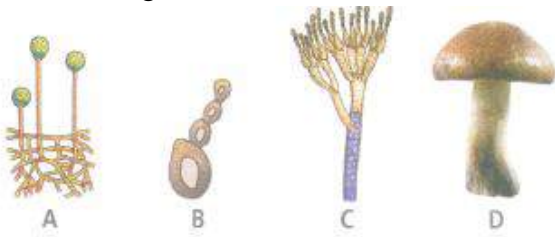
c) If assertion is true but reason is false. d) If both assertion and reason are false.

149. Identify the given figure of a protozoan protist and select the correct option.



- a) *Entamoeba histolytica* b) *Plasmodium vivax* c) *Giardia intestinalis*
d) *Trypanosoma gambiense*
150. In the five-kingdom system of classification, which single kingdom out of the following can include blue green algae, nitrogen-fixing bacteria and methanogenic archaeobacteria?
a) Fungi b) Plantae c) Protista d) Monera
151. The hereditary material present in the bacterium *Escherichia coli* is _____.
a) Single stranded DNA b) Deoxyribose sugar c) Double stranded DNA
d) Single stranded RNA
152. Which of the following organisms are known as chief producers in the oceans?
a) Cyanobacteria b) Diatoms. c) Dinoflagellates d) Euglenoids.
153. *Plasmodium*, the malarial parasite, belongs to class _____.
a) Sarcodina b) Ciliata c) Sporozoa d) Dinophyceae
154. With respect to the fungal sexual cycle, choose the correct sequence of events.
a) Karyogamy, plasmogamy and meiosis b) Meiosis, plasmogamy and karyogamy
c) Plasmogamy, karyogamy and meiosis d) Meiosis, karyogamy and plasmogamy
155. Outerflexible layer in Euglenoids is called
a) cell wall b) Pellicle c) Glycocalyx d) More than one option is correct
156. Viruses are no more "alive" than isolated chromosomes because _____.
a) Both require the environment of a cell to replicate. b) They require both RNA and DNA.
c) They both need food molecules d) They both require oxygen for respiration.
157. Asexual reproduction by zoospore formation is the feature of
a) Sac fungi b) Fungi imperfecti c) Algal fungi d) Club fungi
158. The multinucleate slimy mass of protoplasm which forms the body of slime moulds is called as
a) plasmodium b) myxamoeba c) sporocytes d) periplasmodium.
159. Which one is wrongly matched?
a) Gemma cups - *Marchantia* b) Biflagellate zoospores - Brown algae.
c) Uniflagellate gametes - *Polysiphonia* d) Unicellular organism - *Chlorella*
160. In *Amoeba* and *Paramecium* osmoregulation occurs through _____.
a) Pseudopodia b) Nucleus c) Contractile vacuole d) General surface
161. In the light of recent classification of living organisms into three domains of life (bacteria, archaea and eukarya), which one of the following statements is true about archaea?
a) Archaea completely differ from prokaryotes.
b) Archaea resembles eukarya in all respects.
c) Archaea have some novel features that are absent in other prokaryotes and eukaryotes.
d) Archaea completely differ from both prokaryotes and eukaryotes

162. Select the option that correctly identifies the different genera (A, B, C and D) of Kingdom Fungi shown in figure



a)

A	B	C	D
Mucor	Saccharomyces	Morchella	Amanita

b)

A	B	C	D
Mucor	Saccharomyces	Penicillium	Agaricus

c)

A	B	C	D
Rhizopus	Saccharomyces	Aspergillus	Morchella

d)

A	B	C	D
Aspergillus	Rhizopus	Penicillium	Agaricus

163. Which of the following classes of Kingdom Fungi are characterised by the presence of coenocytic, multinucleate and branched mycelium?

- a) Basidiomycetes b) Phycomycetes c) Ascomycetes d) Deuteromycetes

164. Consider following features

- (A) Organ system level of organisation
(B) Bilateral symmetry
(C) True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics

- a) Annelida, Arthropoda and Mollusca b) Arthropoda, Mollusca and Chordata
c) Annelida, Mollusca and Chordata d) Annelida, Arthropoda and Chordata

165. Virion is

- a) nucleic acid of virus b) antiviral agent c) protein of virus
d) completely assembled virus outside host.

166. Which of the following structures is not found in a prokaryotic cell?

- a) Ribosome b) Mesosome c) Plasma membrane d) Nuclear envelope

167. Lichens are a well known combination of an alga and a fungus where fungus has

- a) A saprophytic relationship with the alga. b) An epiphytic relationship with the alga.
c) A parasitic relationship with the alga. d) A symbiotic relationship with the alga.

168. Which of the following statements is incorrect about the Class Deuteromycetes?

- a) They reproduce only by asexual spores (conidia).
b) Mycelium in these fungi is branched and septate. c) They have only parasitic forms
d) Examples of these fungi are Alternaria, Colletotrichum, and Trichoderma.

169. Dinoflagellates are mostly

- a) marine and saprophytic b) freshwater and photosynthetic
c) marine and photosynthetic d) terrestrial and photosynthetic.

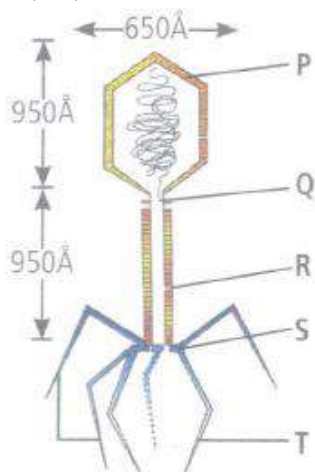
170. Difference between virus and viroid is

- a) Difference between virus and viroid is
b) presence of low molecular weight RNA in virus but absent in viroid c) both (a) and (b)
d) none of the above

171. Sex factor in bacteria is _____.
a) Chromosomal replicon b) F-replicon c) RNA d) Sex-pilus
172. Under favourable conditions slime moulds form
a) Plasmodium b) Spore c) Sporangia d) Cyst
173. The main difference in Gram (+) ve and (Gram (-) ve bacteria resides in their _____.
a) Cell wall b) Cell membrane c) Cytoplasm d) flagella
174. Mark the incorrect match
a) Lichen-Symbiotic association b) T₂phage -ds-DNA c) TMV-ss-RNA
d) Viroid-Free DNA
175. Most of the lichens consist of _____.
a) Blue-green algae and Basidiomycetes b) Blue-green algae and Ascomycetes
c) Red algae and Ascomycetes d) Brown algae and Phycomycetes
176. Which one belongs to the Monera?
a) Amoeba b) Escherichia c) Gelidium d) Spirogyra
177. Which of the following statements is wrong for viroids?
a) They lack a protein coat. b) They are smaller than viruses. c) They cause infections.
d) Their RNA is of high molecular weight
178. Which one of the living organisms completely lacks a cell wall?
a) Mycoplasma b) Saccharomyces c) Blue-green algae d) Cyanobacteria
179. Which of the following statements regarding Kingdom Plantae is correct?
a) It includes all eukaryotic chlorophyll containing organisms.
b) Few of its members are partially heterotrophic c) The cell wall is made up of cellulose.
d) All of these
180. Pigment containing membranous extensions in some cyanobacteria are:
a) Basal bodies b) Pseudopodia c) Chromatophores d) Heterocysts
181. Select the pair that consists of viral diseases
a) Mumps and small pox b) Herpes and influenza c) Pneumonia and syphilis
d) Both (a) and (b)
182. Match column I with column II and select the correct option from the given codes.
- | Column I | Column II |
|---------------------------|-------------------------------|
| A. Edible delicacies | (i) Penicillium, Streptomyces |
| B. Experimental genetics | (ii) Neurospora crassa |
| C. Source of antibiotics | (iii) Puccinia, Ustilago |
| D. Rust and smut diseases | (iv) Morels and truffles |
- a) A-(iv), B-(ii), C-(iii), D-(i) b) A-(iii), B-(i), C-(ii), D-(iv) c) A-(iv), B-(ii), C-(i), D-(iii)
d) A-(iv), B-(iii), C-(ii), D-(i)
183. Members of Kingdom Protista are primarily
a) parasites b) terrestrial c) aquatic d) photosynthetic.
184. Find odd one (w.r.t. contractile vacuole)
a) Ciliates b) Euglena c) Dinoflagellates d) Amoeba
185. Diatomaceous earth is used for all except

- a) polishing b) filtration of oils and syrups c) making sound and fire proof rooms
d) biogas production.
186. Which one is the wrong pairing for the disease and its causal organism?
a) Blackrust of wheat - *Puccinia graminis* b) Loose smut of wheat - *Ustilago nuda*
c) Root knot of vegetables - *Meloidogyne* d) Late blight of potato - *Alternaria solani*
187. Which of the following fungi is a parasite on mustard plant and causes the disease white rust of crucifers?
a) *Albugo candida* b) *Puccinia graminis tritici* c) *Saccharomyces cerevisiae*
d) *Ustilago hordei*
188. Methanogens belong to :
a) Eubacteria b) Archaeobacteria c) Dinoflagellates d) Slime moulds
189. Which of the following is a mismatched pair of protozoan group and its example?
a) Amoeboid protozoan - *Entamoeba histolytica*
b) Flagellated protozoan - *Giardia intestinalis*
c) Ciliated protozoan - *Paramecium caudatum* d) Sporozoan - *Leishmania donovani*
190. **Assertion:** *Euglena* is called as plant animal.
Reason: Pellicle of *Euglena* is made up of cellulose and not protein.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
191. Gametangial copulation act of sexual reproduction occurs in
a) Oomycetes b) ascomycetes c) Basidiomycetes d) Zygomycetes
192. _____ is a parasite of large intestine of human beings and causes the disease _____.
a) *Escherichia coli*, amoebic dysentery b) *Entamoeba histolytica*, amoebic dysentery
c) *Plasmodium vivax*, malaria d) *Trypanosoma gambiense*, sleeping sickness
193. What is true about *Trypanosoma*?
a) Polymorphic b) Monogenetic c) Facultative parasite d) Non-pathogenic
194. Which of the following combinations of characters is true for slime moulds?
a) Parasitic, plasmodium without walls, spores dispersed by air currents
b) Saprophytic, plasmodium with walls, spores dispersed by water
c) Parasitic, plasmodium without walls, spores dispersed by water
d) Saprophytic, plasmodium without walls, spores dispersed by air currents
195. Which of the following are found in extreme saline condition?
a) Archaeobacteria b) Eubacteria c) Cyanobacteria d) Mycobacteria

196. Given is an electron microscopic structure of a T₂ bacteriophage. Identify the labelled parts P, Q, R, S and T and select the correct option.



a)

P	Q	R	S	T
Head	Collar	Sheath	Basal plate	Tail fibre

b)

P	Q	R	S	T
Head	Collar	Capsid	Tail	Tail fibre

c)

P	Q	R	S	T
Capsid	Sheath	Basal plate	Tail	Tail fibre

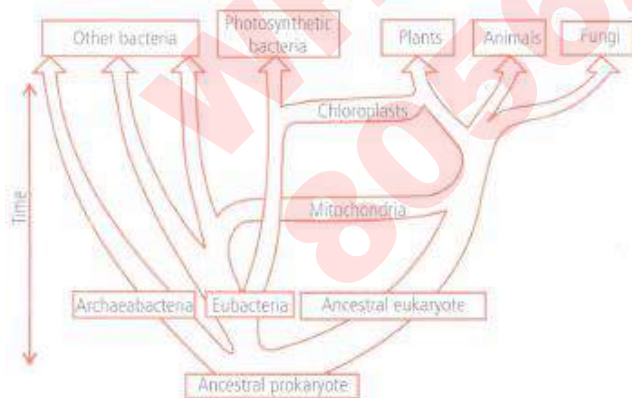
d)

P	Q	R	S	T
Head	Collar	Sheath	Capsomere	Tail fibre

197. In eubacteria, a cellular component that resembles eukaryotic cell is:

a) Nucleus b) Ribosome c) Plasma membrane d) Cell wall

198. Given diagram illustrates an evolutionary tree.



Which of the following statements can be deduced from the given evolutionary tree?

- (i) The ancestral eukaryotes were anaerobic.
- (ii) All eukaryotes possess mitochondria.
- (iii) Eubacteria and Eukaryota have a common ancestor whereas Archeobacteria have a unique and independent origin.
- (iv) Mitochondria and chloroplasts have similar genomes.
- (v) Mitochondria are present in plants, animals and fungi.
- (vi) Chloroplasts and mitochondria arose as endosymbionts.
- (vii) Fungi and animals lost chloroplasts during evolution.

a) (iii), (v) and (vi) b) (i), (v) and (vi) c) (ii), (iii), (iv) and (v) d) (i), (v), (vi) and (vii)

199. Malaria fever coincides with liberation of _____ .

- a) Cryptomerozoites b) Metacryptomerozoites c) Merozoites d) Trophozoites
200. Which one of the following is an incorrect statement regarding mycoplasma?
- a) They lack a cell wall b) They are the smallest living cells.
c) They cannot survive without oxygen. d) They are pathogenic in plants and animals.
201. Which of the following statements is correct regarding sexual reproduction in Basidiomycetes?
- a) Plasmogamy occurs by the fusion of two somatic cells of different strains.
b) Karyogamy and meiosis occur in the basidium producing four basidiospores
c) Basidiospores are exogenously produced on the basidium. d) All of these
202. Read the following statements and select the correct option.
- Statement 1 :** Viruses are inert crystalline structures outside a living cell.
Statement 2 : Viruses are cellular organisms.
- a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.
203. In bacterial chromosomes, the nucleic acid polymers are _____.
a) Linear DNA molecule b) Circular DNA molecule c) of two types - DNA and RNA
d) Linear RNA molecule
204. Which of the following is a ciliated protozoan?
- a) Plasmodium vivax b) Amoeba proteus c) Paramecium caudatum
d) Leishmania donovani
205. Which one single organism or the pair of organisms is correctly assigned to its or their named taxonomic group?
- a) Yeast used in making bread and beer is a fungus.
b) Nostoc and Anabaena are examples of protista
c) Paramecium and Plasmodium belong to the same kingdom as that of Penicillium
d)
- Lichen is a composite organism formed from the symbiotic association of an algae and a protozoan.
206. Which one of the following fungi contains hallucinogens?
- a) Morchella esculenta b) Amanita muscaria c) Neurospora sp. d) Ustilago sp.
207. In general, viruses that infect plants have
- a) ss-RNA b) ds-DNA c) ss-DNA d) ds-RNA
208. Which of the following is the use of lichens in case of pollution?
- a) Lichens are not related with pollution b) They act as bioindicators of pollution
c) They treat the polluted water d) They promote pollution

209. Refer to the given figure and select the incorrect option regarding it.



- a) It belongs to Class Basidiomycetes. b) It is a non-edible, poisonous mushroom.
 - c) It possesses an umbrellalike basidiocarp.
 - d) The basidiospores in it, are exogenously produced on the basidium.
210. Which one of the following statements is incorrect?
- a) Yeast is unicellular and useful in fermentation
 - b) Penicillium is multicellular and produce antibiotics
 - c) Neurospora is used in the study of biochemical genetics.
 - d) Morels and truffles are poisonous mushrooms
211. Which of the following secretes toxins during storage conditions of crop plants?
- a) Aspergillus b) Penicillium c) Fusarium d) Colletotrichum
212. Mycoplasmas are classified under which of the following kingdoms?
- a) Monera b) Protista c) Fungi d) Plantae
213. Lichens indicate SO_2 pollution because they _____.
- a) Show association between algae and fungi b) Grow faster than others
 - c) Are sensitive to SO_2 d) Flourish in SO_2 rich environment
214. What is common about Trypanosoma, Noctiluca, Monocystis and Giardia?
- a) They have flagella. b) They produce spores. c) These are all parasites.
 - d) These are all unicellular protists.
215. Photosynthetic protists are
- a) Slime moulds and ciliates b) Dinoflagellates and zooflagellates
 - c) Dinoflagellates and protozoans d) Euglenoids and protozoans
216. Absorptive heterotrophic nutrition is exhibited by _____.
- a) Algae b) Fungi c) Bryophytes d) Pteridophytes
217. Trypanosoma belongs to class _____.
- a) Sarcodina b) Zooflagellata c) Ciliata d) Sporozoa
218. Secondary mycelium in the life cycle of club fungi, represents
- a) Haplophase b) Dikaryophase c) Diplophase d) Coenocytic phase
219. Ergot of rye is caused by a species of _____.
- a) Uncinula b) Ustilago c) Claviceps d) Phytophthora.
220. In five-kingdom classification system, the kingdom that includes the blue-green algae, nitrogen-fixing bacteria, and methanogenic archaeobacteria is
- a) Plantae b) Fungi c) Protista d) Monera.
221. Protistan genome has _____.
- a) Membrane bound nucleoproteins embedded in cytoplasm
 - b) Free nucleic acid aggregates

- c) Gene containing nucleoproteins condensed together in loose mass
d) Nucleoprotein in direct contact with cell substance
222. Which one of the following microorganisms is used for production of citric acid in industries?
a) *Penicillium citrinum* b) *Aspergillus niger* c) *Rhizopus nigricans*
d) *Lactobacillus bulgaricus*
223. Study the following table carefully and select the correct option for 1, 2, 3 and 4

Characters	Monera	Protista	Fungi	Plantae	Animalia
Cell type	1	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	2	Present in some	Present	Present	Absent
Nuclear membrane	Absent	Present	Present	Present	3
Body organisation	Cellular	Cellular	4	Tissue/organ	Tissue/organ/organ system

a)

1	2	3	4
Prokaryotic	Absent	Absent	Unicellular

b)

1	2	3	4
Prokaryotic	Present	Present	Multicellular

c)

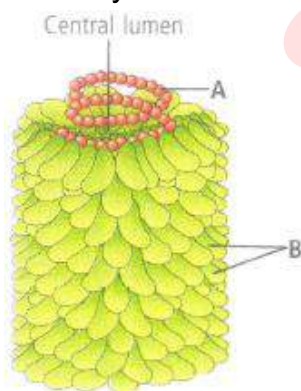
1	2	3	4
Eukaryotic	Absent	Absent	Unicellular

d)

1	2	3	4
Eukaryotic	Absent	Absent	Unicellular

224. Which of the following statements is incorrect regarding the structure of a typical bacterial cell?
a) Cells possess naked circular DNA which is folded to form nucleoid.
b) Cells are surrounded by a peptidoglycan cell wall and a mucilaginous sheath.
c) Cells possess well developed membrane bound cell organelles.
d) Ribosomes in these cells are 70S in nature.
225. Which of the following organisms have been placed under Kingdom Protista?
a) Chrysophytes and dinoflagellates b) Euglenoids c) Slime moulds and protozoans
d) All of these
226. Puccinia forms _____.
a) Uredia and aecia on wheat leaves b) Uredia and telia on wheat leaves
c) Uredia and aecia on barbery leaves d) Uredia and pycnia on barbery leaves
227. Which one of the following is a slime mould?
a) *Physarum* b) *Thiobacillus* c) *Anabaena* d) *Rhizopus*
228. Red tides in warm coastal water develop due to the abundance of
a) dinoflagellates b) euglenoids c) diatoms and desmids d) slime moulds.
229. Association between mycobiont and phycobiont are found in
a) mycorrhiza b) root c) lichens d) BGA.
230. The part of life cycle of malarial parasite *Plasmodium vivax*, that is passed in female *Anopheles* is _____.
a) Sexual cycle b) Pre-erythrocytic schisogony c) Exo-erythrocytic schisogony
d) Post-erythrocytic schisogony
231. Decomposers are organisms that _____.
a) Elaborate chemical substances, causing death of tissues
b) Operate in living body and simplifying organic substances of cells step by step

- c) Attack and kill plants as well as animals
 d) Operate in relay terms, simplifying step by step the organic constituents of dead body
232. Cyanobacteria are used in agricultural fields for crop improvement because they cause
 a) N_2 fixation b) algal blooms c) photosynthesis d) all of these
233. **Assertion:** Cyanobacteria are photosynthetic autotrophs.
Reason: Cyanobacteria have chlorophyll a and b similar to green plants.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
234. Fungi producing 8 spores in a sac belong to the Class
 a) Phycomycetes b) Ascomycetes c) Basidiomycetes d) Deuteromycetes.
235. The cyanobacteria are also referred to as _____.
 a) Protists b) Golden algae c) Slime moulds d) Blue green algae
236. Incorrect statement in relation to cyanobacteria is
 a) Possess chlorophyll a similar to higher plants b) Are unicellular, colonial or filamentous
 c) Form blooms in polluted water bodies and possess a gelatinous sheath
 d) Can fix atmospheric nitrogen in specialised cells called hormogonia
237. Protists obtain food as _____.
 a) Photosynthesisers, symbionts and holotrophs b) Photosynthesisers
 c) Chemosynthesisers d) Holotrophs
238. Mycorrhiza represents _____.
 a) Antagonism b) Endemism c) Symbiosis d) Parasitism
239. The Kingdom Protista forms a link with Kingdom
 a) Plantae b) Fungi c) Animalia d) all of these.
240. Study the given figure of structure of TMV (Tobacco Mosaic Virus) and select the option that correctly identifies the labellings A and B



- | | |
|-------|-------------|
| a) | |
| A | B |
| dsRNA | Tail fibres |
- | | |
|-------|------------|
| b) | |
| A | B |
| ssDNA | Capsomeres |
- | | |
|-------|------------|
| c) | |
| A | B |
| dsDNA | Capsomeres |
- | | |
|-------|------------|
| d) | |
| A | B |
| ssRNA | Capsomeres |

241. The wonder drug, penicillin is extracted from which of the following species of **Penicillium**?
 a) *Penicillium notatum* b) *P. chrysogenum* c) Both (a) and (b) d) None of these
242. Cyanobacteria are classified under which of the following kingdoms?
 a) Monera b) Protista c) Algae d) Plantae

243. Which of the following environmental conditions are essential for optimum growth of *Mucor* on a piece of bread?
- A. Temperature of about 25°C
 - B. Temperature of about 5°C
 - C. Relative humidity of about 5%
 - D. Relative humidity of about 95%
 - E. A shady place
 - F. A brightly illuminated place
- Choose the answer from the following options :
- a) A, D and E only b) B, D and E only c) B, C and F only d) A, C and E only
244. Interferons are _____ .
- a) Antiviral proteins b) Antibacterial proteins c) Anticancer proteins d) Complex proteins
245. Reserve food material in photosynthetic protistan having silicified cell wall is
- a) Paramylum b) Laminarin c) Chrysolaminarin d) Starch
246. Amoebiasis is prevented by _____ .
- a) Eating balanced food b) Eating plenty of fruits c) Drinking boiled water
 - d) Using mosquito nets
247. Select the correct statement regarding heterocysts
- a) These are present in some filamentous cyanobacteria such as **Nostoc** and **Anabaena**.
 - b) These cells are specialised to perform N₂-fixation
 - c) These cells contain enzyme nitrogenase d) All of these
248. *Escherichia coli* is used extensively in biological research as it is _____ .
- a) Easily cultured b) Easily available c) Easy to handle d) Easily multiplied in host
249. Which of the following groups of organisms are included under chrysophytes?
- a) Diatoms and desmids (golden algae) b) Diatoms and dinoflagellates c) Euglenoids
 - d) Slime moulds
250. **Assertion:** Methanogens are present in the gut of several ruminant animals.
Reason: Methanogens help in the production of methane from dung of ruminants.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false. d) If both assertion and reason are false.
251. Which of the following is correct about viroids?
- a) They have RNA with protein coat. b) They have free RNA without protein coat.
 - c) They have DNA with protein coat. d) They have free DNA without protein coat.
252. Photosynthetic pigments of cyanobacteria (blue green algae) include
- a) chlorophyll a b) carotenes c) xanthophylls d) all of these.
253. Which of the following statements regarding Kingdom Animalia is incorrect?
- a) It includes heterotrophic, unicellular eukaryotic organisms.
 - b) The members of this kingdom lack cell walls. c) The mode of nutrition is holozoic.
 - d) The sexual reproduction in its members is by copulation of male and female.
254. Infoldings of plasma membrane which help in DNA replication is

- a) Plasmids b) Nucleoid c) Mesosome d) Slime layer
255. Tobacco Mosaic Virus (TMV) genes are _____.
a) Double stranded RNA b) Single stranded RNA c) Polyrribonucleotides
d) Proteinaceous
256. What is true for cyanobacteria?
a) Oxygenic with nitrogenase b) Oxygenic without nitrogenase
c) Non-oxygenic with nitrogen d) Non-oxygenic without nitrogenase
257. The chief advantage of encystment to an Amoeba is _____.
a) The chance to get rid of accumulated waste products.
b) The ability to survive during adverse physical conditions.
c) The ability to live for sometime without ingesting food.
d) Protection from parasites and predators.
258. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Monera	(i) Chlamydomonas, Solanum
B. Protista	(ii) Bacillus, Oscillatoria
C. Fungi	(iii) Euglena, Trypanosoma
D. Plantae	(iv) Mucor, Penicillium
E. Animalia	(v) Felis, Panthera

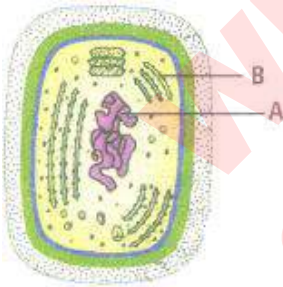
- a) A-(iii), B-(ii), C-(iv), D-(i), E-(v) b) A-(iii), B-(ii), C-(iv), D-(i), E-(v)
c) A-(ii), B-(iii), C-(i), D-(iv), E-(v) d) A-(ii), B-(v), C-(i), D-(iv), E-(iii)
259. **Assertion:** Phycomycetes are commonly known as sac fungi.
Reason: In Phycomycetes, ascopore (sexual spores) are produced endogenously in sac like asci.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
260. Which one of the following statements is wrong?
a) Phycomycetes are also called algai fungi
b) Cyanobacteria are also called blue-green algae
c) Golden algae are also called desmids d) Eubacteria are also called false bacteria
261. **Assertion:** Mycoplasmas are pathogenic in animals and plants.
Reason: Mycoplasmas lack cell wall and can survive without oxygen.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
262. Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen?
a) Bacillus b) Pseudomonas c) Mycoplasma d) Nostoc
263. The site of respiration in bacteria is _____.
a) Episome b) Mesosome c) Ribosome d) Microsome

264. Which of the following characters served as the criteria for five kingdom system of classification as used by R.H. Whittaker?
- a) Cell structure and thallus organisation b) Mode of nutrition and reproduction
c) Phylogenetic relationships d) All of these
265. The plasmid _____.
- a) Helps in respiration b) Genes found inside nucleus
c) Is a component of cell wall of bacteria
d) Is the genetic part in addition to DNA in microorganisms
266. The most thoroughly studied fact of the known bacterioplant interactions is the _____.
- a) Cyanobacterial symbiosis with some aquatic ferns
b) Gall formation on certain angiosperms by Agrobacterium.
c) Nodulation of Sesbania stems by nitrogen fixing bacteria.
d) Plant growth stimulation by phosphate-solubilising bacteria.
267. Which one of the following matches is correct :
- a) Agaricus - Parasitic fungus - Basidiomycetes
b) Phytophthora - Aseptate mycelium - Basidiomycetes
c) Alternaria - Sexual reproduction absent - Deuteromycet
d) Mucor - Reproduction by conjugation - Ascomycetes
268. Genophore bacterial genome or nucleoid is made of _____.
- a) Histones and non-histones b) RNA and histones c) A single double stranded DNA
d) A single stranded DNA
269. In plants, mosaic formation, leaf rolling and curling, yellowing of plant parts, vein clearing, dwarfing and stunted growth, necrosis etc. are the symptoms of
- a) bacterial diseases b) mycoplasmal diseases c) viral diseases d) fungal diseases
270. Select the correct combination of the statements (a - d) regarding the characteristics of certain organisms.
- (1) Methanogens are Archaeobacteria which produce methane in marshy areas
(2) Nostoc is filamentous blue-green alga which fixes atmospheric nitrogen.
(3) Chemosynthetic autotrophic bacteria synthesize
(4) Mycoplasma lack a cell wall and can survive without oxygen.
- a) (3) b) (1), (2), (3) c) (2), (3), (4) d) (1), (2), (4)
271. The given organism belongs to Class



- a) Phycomycetes b) Basidiomycetes c) Ascomycetes d) Deuteromycetes.
272. Viruses are non-cellular organisms but replicate themselves once they infect the host cell. To which of the following kingdom do viruses belong to?
- a) Monera b) Protista c) Fungi d) None of these
273. Which statement is wrong for viruses?

- a) All are parasites b) All of them have helical symmetry
c) They have ability to synthesize nucleic acids and proteins
d) Antibiotics have no effect on them
274. Bacteria lack alternation of generation because there is _____.
a) Neither syngamy nor reduction division b) Distinct chromosomes are absent
c) No conjugation d) No exchange of genetic material
275. The cell wall is composed of two thin overlapping shells which fit together like a soap case in
a) desmids b) diatoms c) dinoflagellates d) slime moulds.
276. A dikaryon is formed when
a) meiosis is arrested b) the two haploid cells do not fuse immediately
c) cytoplasm does not fuse d) none of the above
277. If all ponds and puddles are destroyed, the organism likely to be destroyed is _____.
a) Leishmania b) Trypanosoma c) Ascaris d) Plasmodium
278. Select the incorrect statement.
a) Most plant viruses are RNA viruses b) Bacteriophages possess dsDNA.
c) Virus having an arthropod as vector is called as arbovirus.
d) Prions possess only nucleoid and no proteins
279. Highly resistant nature of endospore is due to the presence of
a) Dipicolinic acid and peptidoglycan in spore coat b) Peptidoglycon in exosporium
c) Dipicolinic acid and Ca^{2+} in cortex d) Dipicolinic acid and Ca^{2+} in cell membrane
280. Given figure represents the ultrastructure of a typical cyanobacterial cell. Identify the different parts and select the correct option for A and B.



a)

A	B
Naked DNA	Thylakoid

b)

A	B
Thylakoid	Naked DNA

c)

A	B
DNA + Histones	Thylakoid

d)

A	B
DNA + Histones	80S ribosomes

281. Which group of organisms is represented by the given figure?



- a) Diatoms b) Dinoflagellates c) Bacteria d) Euglenoids

282. Members of Phycomycetes are found in

- (i) aquatic habitats
- (ii) on decaying wood
- (iii) moist and damp places
- (iv) as obligate parasites on plants.

Choose from the following options.

- a) None of the above b) (i) and (iv) c) (ii) and (iii) d) All of the above

283. Which of the following statements is not correct regarding the Class Ascomycetes?

- a) Conidia are the asexual spores produced endogenously on conidiophores.
- b) Ascospores are the sexual spores produced endogenously in asci.
- c) Aspergillus, Neurospora and Claviceps are Ascomycetes fungi.
- d) Mycelium is generally branched and septate in Ascomycetes.

284. The sporozoa are all internal _____ that typically have an infective cyst stage in their life cycle. An example of sporozoa is the genus _____ which causes malaria.

- a) ciliates, Plasmodium b) flagellates, Plasmodium c) parasites, Plasmodium
- d) parasites, Trypanosoma

285. **Assertion:** In lichens, mycobiont and phycobiont are symbiotically associated in which algae is predominant and fungi is a subordinate partner.

Reason: The fungus provides food and alga protects the fungus from unfavourable conditions.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false. d) If both assertion and reason are false.

286. Absorption of DNA of dead relatives from surrounding medium by a living bacterium is called

- a) Penicillin b) Streptomycin c) Terramycin d) Chloramphenicol

287. Select the mismatch.

- a) Gas vacuoles - Green bacteria Cells b) Large central vacuoles - Animal cells
- c) Protists - Eukaryotes d) Methanogens - Prokaryotes

288. Viroids differs from viruses in having:

- a) DNA molecules without protein coat. b) DNA molecules without protein coat
- c) RNA molecules with protein coat. d) RNA molecules without protein coat

289. A slide under microscope shows following features:

- (i) Unicellularity
- (ii) Well defined nucleus
- (iii) Biflagellate-one flagellum lying longitudinally and the other transversely

What would you identify it as?

- a) Protozoan b) Bacterium c) Euglenoid d) Dinoflagellate

290. Which of the following shows coiled RNA strand and capsomeres?

- a) Polio virus b) Tobacco mosaic virus c) Measles virus d) Retrovirus

291. How many organisms in the list given below are autotrophs? Lactobacillus, Nostoc, Chara, Nitrosomonas, Nitrobacter, Streptomyces. Saccharomyces, Trypanosomes, Porphyra, Wolffia.

- a) Four b) Five c) Six d) Three

292. The causative agent of mad-cow disease is a _____ .

- a) Prion b) Worm c) Bacterium d) Virus
293. Who discovered Plasmodium in RBCs of human beings?
a) Ronald Ross b) Mendel c) Laveran d) Stephen
294. Identify the given figure and select the correct option.
a) It is photosynthetic protist. b) It is saprophytic protist. c) It is chemosynthetic bacteria
d) Both (a) and (b)
295. _____ is the most common method of reproduction in bacteria.
a) Binary fission b) Endospore formation c) Conjugation d) Sexual reproduction

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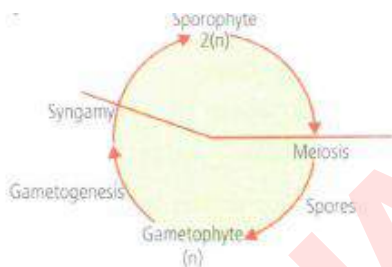
Time : 1 Mins

PLANT KINGDOM 1

Marks : 1797

1. Which among the following was not the criteria for classification of organisms into 5 kingdoms proposed by whittaker?
a) Reproduction b) Phylogenetic relationship c) Mode of nutrition
d) Metabolism
2. Coralloid roots of _____ have symbiotic association with N_2 - fixing cyanobacteria.
a) Pinus b) Cedrus c) Cycas d) Ginkgo
3. Natural system of classification differs from artificial system in
a) employing only one floral trait b) employing only one vegetative trait
c) bringing out similarities and dissimilarities
d) developing evolutionary trends.
4. Gemmae are the specialised structures produced in liverworts. These are
a) non-green, multicellular, asexual buds which develop in gemma cups
b) green, multicellular, asexual buds which develop in gemma cups
c) non-green, multicellular, diploid, sexual spores
d) green, unicellular, diploid, sexual spores
5. _____ and _____ are unicellular algae, rich in proteins, that are used as food supplements even by space travellers.
a) Chlorella, Spirulina b) Gelidium, Gracilaria c) Porphyra, Spirogyra
d) Laminaria, Spirogyra
6. Identify the Incorrect Pair
a) Haplontic Life Cycle - Spirogyra b) Haplo - diplontic life Cycle - Bryophytes
c) Diplontic life Cycle - pinus d) Diplo - haplontic life Cycle - Fucus
7. Photosynthetic pigments of Rhodophyceae (red algae) are
a) chl a and b b) chl a and c, fucoxanthin c) chl a and d
d) chl a, chl d and phycoerythrin.
8. Which one of the following does not differ in E.coli and Chlamydomonas?
a) Cell wall b) Cell membrane c) Ribosomes
d) Chromosomal Organization

9. Gymnosperms do not include
a) herbs b) shrubs c) trees d) both (a) and (b).
10. Incorrect Statement in relation to pteridophytes is:
a) Main plant body is a differentiated Sporophyte
b) Root, stem and leaves possess well differentiated vascular tissues
c)
Sporophytes bear sporangia which are subtended by leaf like appendages called sporophylls
d)
Spores germinate to give rise to conspicuous multicellular, free living always photosynthetic thalloid gametophyte called prothallus
11. The bacterium (*Clostridium botulinum*) that causes botulism is
a) a facultative aerobe b) an obligate aerobe c) a facultative anaerobe
d) an obligate anaerobe
12. Select the incorrect statement with respect to given type of life cycle.



- a) Meiosis occurs at the time of spore formation in sporophytic plant.
b) Gametophytic plant is produced by germination of spores.
c) This life cycle is exhibited by most algae and some seed bearing plants
d) This life cycle is exhibited by many bryophytes and pteridophytes.
13. In **Funaria**, the haploid structure is
a) protonema b) capsule c) columella d) seta.
14. Green algae are considered as ancestors of higher plants due to their resemblance with higher plants in:-
a) Pigments b) Cell wall c) Stored food d) All the above
15. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Spirogyra	(i) Unicellular
B Chlamydomonas	(ii) Filamentous
C. Volvox	(iii) Colonial form
D. Some giant marine forms	(iv) Kelps

- a) A-(ii), B-(i), C-(iii), D-(iv) b) A-(ii), B-(iii), C-(iv), D-(i)
c) A-(iii), B-(ii), C-(iv), D-(i) d) A-(iii), B-(ii), C-(iv), D-(i)
16. A member of Class Chlorophyceae is
a) Chlamydomonas b) Volvox c) Ulothrix d) all of these.
17. Which one of the following living organisms completely lacks a cell wall?
a) Cyanobacteria b) Sea-fan(Gorgonia) c) Saccharomyces
d) Blue-green algae
18. Ulothrix can be described as a _____.
a) non-motile colonial alga lacking zoospores
b) filamentous alga lacking flagellated reproductive stages
c) membranous alga producing zoospores
d) filamentous alga with flagellated reproductive stages
19. Artificial systems gave equal weightage to vegetative and sexual characteristics; this is not acceptable because often _____ characters are more easily affected by environment.
a) vegetative b) sexual c) anatomical d) physiological
20. The most efficient locomotion in protists is through:-
a) Pseudopodia b) Flagella c) Cilia d) Tentacles
21. The giant Redwood tree (*Sequoia sempervirens*) is a an
a) angiosperm b) free fern c) pteridophyte d) gymnosperm.
22. One of the important consequences of geographical isolation is:-
a) Random creation of new species b) No change in the isolated fauna
c) Preventing Speciation d) Speciation through reproductive isolation
23. Some hyperthermophilic organisms that grow in highly acidic (pH2) habitats belong to the two groups:-
a) Liverworts and yeasts b) Eubacteria and archaea
c) Cyanobacteria and diatoms d) Protists and mosses
24. The bryophytes are usually found in
a) damp and shaded areas b) marine habitat c) sandy soils
d) xeric habitat.
25. Yeast is used in the production of:-
a) Bread and beer b) Cheese and butter c) Citric acid and lactic acid
d) Lipase and pectinase
26. Match the following list of microbes and the importance:

(a) Saccharomyces cerevisiae	(i) Production of immunosuppressive agents
(b) Monascus purpureus	(ii) Ripening of swiss cheese

(c) Trichoderma polysporum	(iii) Commercial production of ethanal
(d) Propionibacterium sharmanii	(iv) Production of blood cholesterol lowering agents

a)	b)	c)	d)
a b c d	a b c d	a b c d	a b c d
iii i iv ii	iii iv i ii	iv iii iii i	iv ii i iii

27. Which one of the following statement is true about bacteriophages?

- a) They are generally single standard RNA viruses
- b) They are generally double standard DNA viruses
- c) They are generally single standard DNA viruses
- d) They are generally double standard RNA viruses

28. **Assertion:** Selaginella and Salvinia are homosporous.

Reason: Similar kind of spores are produced in Selaginella and Salvinia.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false

d) If both assertion and reason are false.

29. No zoospore formation has been observed in the algal members belonging to:-

- a) Chlorophyceae b) Brown algae c) Phaeophyceae d) Cyanophyceae

30. **Assertion:** Mosses are of great ecological importance.

Reason: Mosses prevent soil erosion by forming dense mat on the soil.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

31. Match the following

(a) D.J Ivanowsky	(i) Discovery of viroids
(b) Beijerinck	(ii) Crystallisation of virus
(c) W.M. Stanley	(iii) Contagium vivum fluidum

(d) T.O. Diener	(iv) Discovery of TMV
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- a) a(iv), b(iii), c(ii), d(i) b) a(iv), b(iii), c(i), d(ii) c) a(iii), b(iv), c(ii), d(i)
d) a(ii), b(iii), c(iv), d(i)

32. Algae have cell wall made up of:

- a) Cellulose, hemicellulose and pectins b) Cellulose, galactans and mannans
c) Hemicellulose, pectins and proteins d) Pectins, cellulose and proteins

33. Trichodesmium erythrium which imparts red color to sea water of red sea is a:

- a) Cyanobacterium b) Red Algae c) Diatom d) Red Coral

34. How many organisms in the list given below are autotrophs?

Lactobacillus, Nostoc, Chara, Nitrosomonas, Nitrobacter, Streptomyces, Sacharomyces, Trypanosoma, Porphyra, Wolfia

- a) Six b) Three c) Four d) Five

35. Transformation was discovered by:-

- a) Meselson and Stahl b) Hershey and Chase c) Griffith
d) Watson and Crick

36. Fungus prefers to grow in:-

- a) Warm and humid places b) Cold and humid places
c) Warm and cold both d) Warm, cold and humid places

37. Chlorophylla, chlorophyll and phycoerythrin pigments are found in:

- a) Cyanophyceae b) Bacillariophyceae c) Rhodophyceae
d) Chlorophyceae

38. The product of conjugation in Spirogyra or fertilisation of Chlamydomonas is

- _____ .
a) zygospore b) zoospore c) oospore d) carpospore

39. Which of the following is not monoecious plant?

- a) Cycas b) Pinus c) Wheat d) Mustard

40. Rhizoids of hepaticopsida and anthocerotopsida are:-

- a) Multicellular and branched b) Unicellular and unbranched
c) Unicellular and branched d) Multicellular and unbranched

41. Membrane-bound organelles are absent in:

- a) Plasmodium b) Mustard c) Castor d) Chlamydomonas

42. The alga which can be employed as food for human beings is:

- a) Chlorella b) Spirogyra c) Polysiphonia d) Ulothrix

43. In the prothallus of a vascular cryptogam, the antherozoids and eggs mature at different times. As a result:

- a) Self fertilization is prevented
 b) There is no change in success rate of fertilization
 c) There is high degree of sterility
 d) one can conclude that the plant is apomictic
44. Which one of the following is monoecious?
 a) Cycas b) Pinus c) Date palm d) Marchantia
45. Life cycle of Ectocarpus and Fucus respectively are:
 a) Haplontic, Diplontic b) Diplontic, Haplodiplontic
 c) Haplodiplontic, Diplontic d) Haplodiplontic, Haplontic
46. Major photosynthetic pigments in green algae are
 a) Chl a and b b) Chl a, c and fucoxanthin c) Chl a, d and phycoerythrin
 d) Chl a and c.
47. Match the contents of column-I with those column-II

Column-I	Column-II
(a) Fungi	(i) Chitinase
(b) Bacteria	(ii) Cellulase
(c) Plant cell	(iii) Lysozymes

a)	b)	c)	d)
abc	abc	abc	abc
i ii iii	iii ii i	ii iii i	i iii ii

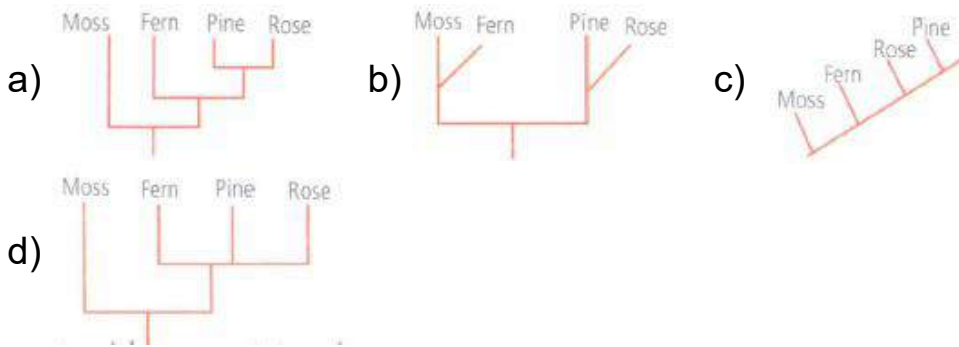
48. In angiosperms, microsporogenesis and megasporogenesis _____ .
 a) Form gametes without further divisions b) Involve meiosis
 c) Occur in ovule d) Occur in anther
49. Phycobilins are characteristic pigments of:-
 a) Rhodophyta and phaeophyta b) Rhodophyta and phaeophyta
 c) phaeophyta and cyanophyta d) Rhodophyta and cyanophyta
50. An example of colonial alga is:
 a) Chlorella b) Volvox c) Ulothrix d) Spirogyra
51. Which pair of the following belong to Basidiomycetes?
 a) Morchella and Mushrooms b) Birds' nest fungi and Puffballs
 c) Puffballs and Claviceps d) Peziza and stink horns
52. Artificial systems of classification were based upon
 a) vegetative characters b) androecium structure c) habit and habitat
 d) all of these
53. Which one single organism or the pair of organism is correctly assigned to its or their named taxonomic group?

- a) Yeast used in making bread and beer is a fungus
 b) Nostoc and Anabaena are examples of protistes
 c)
 Paramecium and plasmodium belong to the same kingdom as that of Penicillium
 d)
 Lichen is a composite organism formed from the symbiotic association of an algae and protozoan
54. Bacterial leaf blight of rice is caused by a species of:-
 a) Alternaria b) Erwinia c) Xanthomonas d) Pseudomonas
55. Evolutionary history of an organism is known as:
 a) Paleontology b) Ontogeny c) Phylogeny d) Ancestry
56. Spore dissemination in some liverworts is aided by:
 a) Peristome teeth b) Elaters c) Indusium d) Calyptra
57. Edible part in mushrooms is:-
 a) Basidiospores b) Mycelium c) Pseudomycelium d) Complete basidiocarp
58. Pneumatophores occur in _____.
 a) Carnivorous plants b) Free-floating hydrophytes c) Halophytes
 d) Submerged hydrophytes
59. Haplo-diplontic life cycle is found in
 a) bryophytes b) pteridophytes c) fungi d) both (a) and (b).
60. In which of the following characters, the angiosperms resemble gymnosperms?
 a) Presence of ovule b) Absence of endosperm c) Presence of vessels
 d) Mode of fertilisation by zooidiosiphonogamy
61. Evolutionary important character of Selaginella is _____.
 a) heterosporous nature b) rhizophore c) strobili d) ligule
62. Blue-green algae belong to _____.
 a) eukaryotes b) prokaryotes c) Rhodophyceae d) Chlorophyceae
63. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Non-vascular cryptogams	(i) Gymnosperms, angiosperms
B. Vascular cryptogams	(ii) Pteridophytes
C. Phanerogams	(iii) Algae, bryophytes

- a) A-(iii), B-(ii), C-(i) b) A-(ii), B-(i), C-(iii) c) A-(i), B-(ii), C-(iii)
 d) A-(ii), B-(iii), C-(i)

64. A phylogenetic tree or evolutionary tree is a branching diagram showing the inferred evolutionary relationships among various biological species. Which of the following phylogenies is correctly represented?



65. Zygotic meiosis is characteristic of:

- a) Marchantia b) Fucus c) Funaria d) Chlamydomonas

66. In which one of these the elaters are present along with mature spores in the capsule (to help in spore dispersal)?

- a) Riccia b) Marchantia c) Funaria d) Sphagnum

67. Which of the following is a flowering plant with nodules containing filamentous nitrogen-fixing microorganism?

- a) Cicer arietinum b) Casuarina equisetifolia c) Crotalaria juncea
d) Cycas revoluta

68. Match Column-I with Column-II

Column-I	Column-II
(A) Saprophyte	(i) Symbiotic association of fungi with plant roots of fungi with plant roots
(B) Parasite	(ii) Decomposition of dead organic materials
(C) Lichens	(iii) Living on living plants or animals
(D) Mycorrhiza	(iv) Symbiotic association of algae and fungi

Choose the correct answer from the option given below:

- a) (A)(B)(C)(D) b) (A)(B)(C)(D) c) (A)(B)(C)(D) d) (A)(B)(C)(D)
(a)(iii)(ii) (i) (iv) (b)(ii) (i) (iii)(iv) (c)(ii) (iii)(iv)(i) (d)(i) (ii) (iii)(iv)

69. Myxomycetes are-

a)

saprobies or parasites, having mycelia, a sexual reproduction by fragmentation, sexual reproduction

b)

Slimy mass of multinucleate protoplasm, having pseudopodia-like structures for engulfing food reproduction through fragmentation of zoospores

c)

Prokaryotic organisms, cellular or acellular saprobies or autotrophic, reproduce by binary fission

d)

Eukaryotic, single-celled or filamentous saprobies or autotrophic, asexual reproduction by division of haploid individuals, sexual reproduction by fusion of two cells or their nuclei

70. Cup-shaped chloroplast is present in

a) Spirogyra b) Chlamydomonas c) Ulothrix d) Chara.

71. In pteridophyta, reduction division occurs when:-

a) Prothallus is formed b) Spores are formed c) Sex organs are formed
d) Gametes are formed

72. In which of the following would you place the plants having vascular tissue, lacking seeds?

a) Algae b) Bryophytes c) Pteridophytes d) Gymnosperms

73. The number of species that are known and described ranges between:

a) 1-2 million b) 1.7-1.8 billion c) 1.7-1.8 million d) 7 million

74. Pigment-containing membranous extensions in some cyanobacteria are:

a) Chromatophores b) Heterocysts c) Basal bodies d) Pneumatophores

75. Which one of the following is a vascular cryptogam?

a) Ginkgo b) Marchantia c) Cedrus d) Equisetum

76. A good producer of citric acid is:

a) Saccharomyces b) Aspergillus c) Pseudomonas d) Clostridium

77. **Assertion:** Bryophytes are called as terrestrial amphibians.

Reason: Bryophytes require an external layer of water on the soil surface for their existence.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

78. Five kingdom system of classification suggested by R.H. Whittaker is not based on:

a) Presence or absence of a well defined nucleus b) Mode of reproduction

c) Mode of nutrition d) Complexity of body organisation

79. The common nitrogen -fixer in paddy fields is:

a) Frankia b) Rhizobium c) Azospirillum d) Oscillatoria

80. The plant body of moss (Funaria) is _____.

a) completely sporophyte b) completely gametophyte

c) predominantly sporophyte with gametophyte

d) predominantly gametophyte with sporophyte

81. Select true statement about lichens:-

a) These are very good pollution indicators

b) The algal component of lichen is known as phycobiont

c) The fungal component of lichen is known as mycobiont d) All the above

82. ICBN stands for:

a) Indian code of Botanical Nomenclature

b) Indian Congress of Botanical Names

c) International code of Botanical Nomenclature

d) International Congress of Botanical Names

83. A sterile jacket around gametangia is found among

a) bryophytes b) lichens c) algae d) fungi.

84. In **Ulothrix**, sexual reproduction is by

a) isogamy b) anisogamy c) oogamy d) conjugation.

85. Pteridophytes differ from mosses/ bryophytes in possessing _____.

a) flagellate spermatozoids b) independent gametophyte

c) well developed vascular system d) archegonia

86. Gymnosperms are also called soft wood spermatophytes because they lack:

a) Thick walled tracheids b) Xylem fibres c) Cambium d) Phloem fibres

87. Which one of the following matches is correct?

a)

Alrenaria	Sexual reproduction absent	Deuteromycetes
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b)

Mucor	Reproduction by Conjugation	Ascomycetes
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c)

Agaricus	Parasitic fungus	Basidiomycetes
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d)

Phytophthora	Aseptate mycelium	Basidiomycetes
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88. Which one is wrong statement?

- a) Mucor has biflagellate zoospores.
- b) Haploid endosperm is typical feature of gymnosperms.
- c) Brown algae have chlorophyll a and c and fucoxanthin.
- d) Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms

89. Algin is phycocolloid, obtained from the cell wall of

- a) Polysiphonia and Porphyra
- b) Gelidium and Laminaria
- c) Microcystis and Volvox
- d) Focus and Dictyota

90. The algae shown in the given figure belong to the Class



- a) Chlorophyceae
- b) Phaeophyceae
- c) Rhodophyceae
- d) Cyanophyceae.

91. Read the given statements and select the correct option.

Statement 1 : Bryophytes are amphibians of plant kingdom.

Statement 2 : They live in soil but depend on water for sexual reproduction.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct
- d) Both statements 1 and 2 are incorrect.

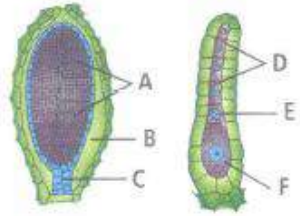
92. In **Pinus**, male strobilus bears a large number of

- a) anthers
- b) stamens
- c) microsporophylls
- d) megasporophylls.

93. Branch of biology, which deals with study of relationship among different kind of organisms, is

- a) Taxonomy
- b) systematics
- c) Ecology
- d) Taximetrics

94. Refer to the following figures regarding Division Bryophyta.



- (i) 'A' are the androcyte mother cells of the antheridium, which give rise to a large number of biflagellate male gametes.
- (ii) 'B' is the antheridial chamber and 'C' is the multicellular stalk of antheridium.
- (iii) 'D' and 'E' respectively represent venter canal cells and neck canal cell of the female sex organ.
- (iv) 'F' is the egg cell of the archegonium, which usually possesses several female gametes.

Which of the following combinations of above statements is incorrect?

- a) (i) and (ii) b) (iii) and (iv) c) (ii) and (iii) d) (i) and (iv)

95. Which of the following statements is correct?

- a) Azotobacter fixes atmospheric nitrogen in the nodules of legumes
- b) Certain cyanobacteria like Anabaena can fix nitrogen in paddy fields
- c) Azospirillum species fixes nitrogen in chick-pea
- d) Mycorrhiza absorb nitrates from soil and provide it to the plant

96. Bryophytes comprise _____.

- a) Sporophyte of longer duration
- b) Dominant phase of sporophyte which is parasitic
- c) Dominant phase of gametophyte which produces spores
- d) Small sporophyte phase generally parasitic on gametophyte

97. Read the following five statements (A-E) and answer as asked next to them:-

- (A) In Equisetum the female gametophyte is retained on the parent sporophyte
- (B) In Ginkgo male gametophyte is not independent
- (C) The sporophyte in Riccia is more developed than that in Polytrichum
- (D) Sexual reproduction in Volvox is isogamous
- (E) The spores of slime molds lack cell walls

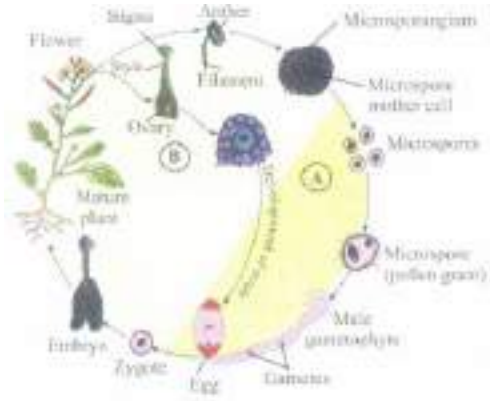
How many of the above statements are correct?

- a) Four b) One c) Two d) Three

98. Which of the following is not a moss?

- a) Polytrichum b) Sphagnum c) Funaria d) Riccia

99. The given figure shows two phases, A and B of a typical angiospermic life cycle. Select the correct option regarding it.



a)

A	B
Gametophytic generation (n)	Sporophytic generation (2n)

b)

A	B
Sporophytic generation (2n)	Gametophytic generation (n)

c)

A	B
Sporophytic generation (2n)	Sporophytic generation (2n)

d)

A	B
Gametophytic generation (n)	Gametophytic generation (n)

100. Dichotomous branching is found in _____ .

a) Fern b) Funaria c) Liverworts d) Marchantia

101. _____ classification systems were based on evolutionary relationships between various organisms.

a) Natural b) Artificial c) Phylogenetic d) Both (a) and (b)

102. The standard size of herbarium sheets is:-

a) 11.5" x 16.5" b) 15.5" x 16.5" c) 18.5" x 10.5" d) 20.5" x 21.5"

103. The prominent phase in the life cycle of bryophytes is

a) gametophyte b) sporophyte c) seta d) sporogonium.

104. Floridean starch has structure similar to _____ .

- a) Mannitol and algin b) Laminarin and cellulose c) Starch and cellulose
d) Amylopectin and glycogen
105. Endomycorrhizal fungus is:-
a) Amanita b) Boletus c) Glomus d) Pisolithus
106. A plant in which sporophytic generation is represented by zygote is _____ .
a) Pinus b) Selaginella c) Chlamydomonas d) Dryopteris
107. Autotrophic aquatic organisms which usually reproduce vegetatively by fragmentation, and perform sexual reproduction also by the nonmotile gametes. These organism are:-
a) Polysiphonia, Porphyra, Gracilaria b) Ectocarpus, Dictyota, Laminaria
c) Laminaria, Fucus, Sargassum d) Volvox, Chara, Spirogyra
108. Select one of the following of important featuresdistinguishing Gnetum from Cycas and Pinus and showing:
a) Embryo development and apical meristem
b) Absence of resin duct and leaf venation
c) Presence of vessel elements and absence of archegonia
d) Perianth and two integuments
109. One of the free-living, anaerobic nitrogen-fixer is:
a) Azotobacter b) Beijernickia c) Rhodospirillum d) Rhizobium
110. which group of organism is related with basidiomycetes?
a) Mushroom, Ustilago, Aspergillus b) Puffballs, Agaricus, Aspergillus
c) Mushroom, Ustilago, Agaricus d) Ustilago, Aspergillus, Agaricus
111. Most advanced Gymnosperm belongs to:-
a) Cycadales b) Coniferales c) Gnetales d) Cyadofillicales
112. Read the given statements and select the correct option.
Statement 1: Main plant body of bryophytes is sporophytic.
Statement 2: Main plant body of pteridophytes is gametophytic.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
113. Grass leaves curl inwards during very dry weather. Select the most appropriate reason from the following:
a) Flaccidity of bulliform cells b) Shrinkage of air spaces in spongy mesophyll
c) Tyloses in vessels d) Closure of stomata

114. Winged pollens are present in:
a) Mango b) Cycas c) Mustard d) Pinus
115. In angiosperms, functional megaspore develops into _____.
a) Embryo sac b) Ovule c) Endosperm d) Pollen sac
116. Which one of the following statements is wrong?
a) Mannitol is stored in Rhodophyceae
b) Algin and Carrageen are product of algae
c) Agar-agar is obtained from Gelidium and Gracilaria
d) Chlorella and Spirulina are used as space food.
117. Selaginella and Salvinia are considered to represent a significant step toward evolution of seed habit because:
a) Megaspores possess endosperm and embryo surrounded by seed coat
b) Embryo develops in female gametophyte which is retained on parent sporophyte
c) Female gametophyte is free and gets dispersed like seeds
d) Female gametophyte lacks archegonia
118. Male gametophyte with least number of cells is present in:
a) Funaria b) Lilium c) Pinus d) Pteris
119. Bryophytes can be separated from algae because they _____.
a) are thalloid forms b) have no conducting tissue
c) possess archegonia with outer layer of sterile cells
d) contain chloroplasts in their cells
120. **Assertion :** Red colour of Rhodophyta is due to abundant formation of r-phycoerythrin.
Reason : r-Phycoerythrin is able to absorb blue-green wavelength of light and reflect red colour.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
121. In bryophytes

- a) sporophytes are dependent upon gametophytes
 - b) sporophyte and gametophyte generations are independent
 - c) sporophyte in itself completes the life cycle
 - d) gametophytes are dependent upon sporophyte.
122. Select the correct pattern of arrangement of reproductive structures for gymnosperms.
- a) Spores → Sporophylls → Sporangia → Strobili
 - b) Spores → Sporangia → Sporophylls → Strobili
 - c) Sporangia → Sporophylls → Spores → Strobili
 - d) Spores → Sporangia → Strobili → Sporophylls
123. Mycorrhizal roots of _____ are associated with some fungal symbionts.
- a) Pinus b) Cedrus c) Cycas d) Ginkgo
124. Algae, bryophytes and pteridophytes resemble with each other in which one of the following feature?
- a) Main body is gametophytic b) Dependence on water for fertilisation
 - c) Absence of alternation of generations d) Presence of embryo
125. Which of the following is responsible for peat formation?
- a) Marchantia b) Riccia c) Funaria d) Sphagnum
126. The absence of chlorophyll, in the lowermost cell of Ulothrix, shows _____.
- a) functional fission b) tissue formation c) cell characteristic
 - d) beginning of labour division
127. All single celled eukaryotes placed under protista and the link with fungi, plants and animals, Slime moulds are saprophytic protists. what is incorrect about it:
- a) Body moves along decaying twigs and leaves engulfing organic matter
 - b) Under suitable conditions from plasmodium which may grow and spread over several feet
 - c) Under favourable conditions plasmodium differentiate and form fruiting body
 - d) Their spores possess cell wall
128. Which one of the following is wrong statement
- a) Phosphorus is a constituent of cell membranes certain nucleic acids and all proteins
 - b) Nitrosomonas and Nitrobacter are chemoautotrophs
 - c) Anabaena and Nostoc are capable of fixing nitrogen in free-living state also
 - d) Root nodule forming nitrogen fixers live aerobically under free-living conditions

129. Viruses have:-

- a) DNA enclosed in a protein coat b) Prokaryotic nucleus
- c) Single chromosome d) Both DNA and RNA

130. In taxonomy the first step is:-

- a) Identification b) Nomenclature c) Classification d) Affinities

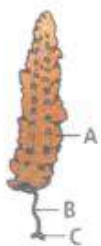
131. Which one of the following is correct statement?

- a) A antheridiophores and archegoniophores are present in pteridophytes
- b) Pteridophytes gametophyte has a protonemal and leafy stage
- c) In gymnosperms, female gametophyte is freeliving
- d) Origin of seed habit can be traced in pteridophytes

132. Heterospory is found in some members of _____ and all members of _____.

- a) Bryophyta, Pteridophyta b) Pteridophyta, Bryophyta
- c) Bryophyta, Gymnospermae d) Pteridophyta, Spermatophyta

133. Refer to the given figure and select the correct option.



a)

A	B	C
Stipe	Holdfast	Frond

b)

A	B	C
Frond	Stipe	Holdfast

c)

A	B	C
Holdfast	Frond	Stipe

d)

A	B	C
Stipe	Frond	Holdfast

134. Which of the following statements is correct regarding microbes in human welfare?

- a) Saccharomyces cerevisiae is useful in industries for production of citric acid
- b) Trichoderma polysporum is used as blood cholesterol lowering agent
- c) Aspergillus niger used to obtain acetic acid

d)

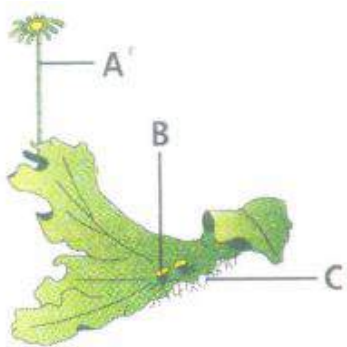
In sewage treatment CO_2 , H_2 , and CH_4 gases are produced from activated sludge by bacteria such as Methanobacterium

135. The main difference between gram \oplus and gram \ominus resides in the composition of:-

- a) Cilia b) Cell-wall c) Cell-membrance d) Cytoplasm

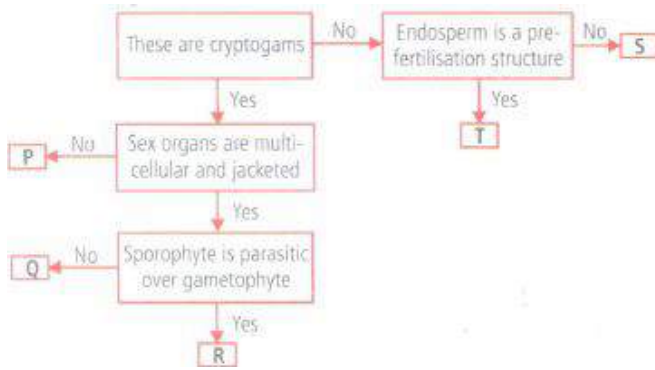
136. The embryo sac of an angiosperm is made up of

- a) 8 cells b) 7 cells and 8 nuclei c) 8 nuclei d) 7 cells and 7 nuclei.
137. Each cell of Volvox colony has a structure; similar to
a) Ulothrix b) Spirogyra c) Chlamydomonas d) Nostoc.
138. The spread of living pteridophytes is limited and is restricted to narrow geographical region because
a) gametophytic growth needs cool, damp and shady places
b) there is requirement of water for fertilisation
c) there is absence of stomata in leaf and absence of vascular tissue
d) both (a) and (b).
139. Select the option that correctly identifies A, B and C in the given figure of female thallus of Marchantia.



- a) A - Antheridiophore, B - Gemma cup, C - Rhizoids
b) A - Antheridiophore, B - Rhizoids, C - Gemma cup
c) A - Archegoniophore, B - Gemma cup, C - Rhizoids
d) A - Archegoniophore, B - Rhizoids, C - Gemma cup
140. Read the following statements regarding bryophytes and select the correct answer.
(i) Bryophytes lack true roots, stem and leaves.
(ii) The main plant body is haploid.
(iii) Sex-organs are unicellular and non-jacketed.
(iv) Fertilisation produces an embryo inside the water.
a) Statements (i) and (ii) are correct. b) Statements (ii) and (iii) are correct.
c) Statements (iii) and (iv) are correct. d) All statements are correct.
141. The structures that help some bacteria to attain to rocks and /or host tissues are:
a) Holdfast b) Rhizoids c) Fimbriae d) Mesosomes

142. Refer to the given flow chart regarding different groups of Kingdom Plantae.



Which of the following is true regarding P, Q, R, S and T?

- Examples of group 'P' include Riccia, Marchantia, Sphagnum, etc.
- Members of group 'R' can be both homosporous as well as heterosporous.
- Group 'Q' includes seedless vascular plants having sporophytic plant body.
-

Group 'S' is more ancient than group T and formed a dominant vegetation on Earth some 200 million years back in mesozoic era.

143. Single-celled eukaryotes are included in:-

- Monera
- Protista
- Fungi
- Archaea

144. The function of mesosome in prokaryotes is:-

- Aerobic respiration
- Cell wall formation
- Both (1) and (2)
- N₂-fixation

145. Deuteromycetes are called 'Imperfect fungi' as:-

- They have no cell wall
- No mycelium
- No sexual reproduction
- No asexual reproduction

146. Holdfast, stipe and frond constitute the plant body in case of

- Rhodophyceae
- Chlorophyceae
- Phaeophyceae
- all of these.

147. Plant *Ocimum sanctum* belongs to kingdom Plantae. As per taxonomic terminology term kingdom and Plantae are respectively:

- taxon and category
- category and taxon
- taxon and division
- taxonomy and systematics

148. Chromatophores take part in:

- Respiration
- Photosynthesis
- Growth
- Movement

149. In prokaryotes, chromatophores are-

- Specialized granules responsible for colouration of cells
- structures responsible for organizing the shape of the organism

c)

Inclusion bodies lying free inside the cells for carrying out various metabolic activities

d)

Internal membrane systems that may become extensive and complex in photosynthetic bacteria

150. The diatoms do not easily decay like most of the other Algae because:-

- a) They have water proof cell b) Their walls are mucilaginous
c) They have highly siliceous wall d) They are non living

151. In Ulothrix/Spirogyra a, reduction division (meiosis) occurs at the time of _____.

- a) gamete formation b) zoospore formation c) zygospore germination
d) vegetative reproduction

152. Nuclear membrane is absent in:-

- a) Penicillium b) Agaricus c) Volvox d) Nostoc

153. Mannitol is stored food in:

- a) Porphyra b) Fucus c) Gracilaria d) Chara

154. In which of the following gametophyte is not independent free living?

- a) Pinus b) Funaria c) Marchantia d) Pteris

155. Which one of the following statements is wrong?

- a) Cyanobacteria are also called blue-green algae
b) Golden algae are also called desmids
c) Eubacteria are also called false bacteria
d) Nitrococcus Phycomycetes are also called algal fungi

156. Common example of red algae is

- a) Porphyra b) Batrachospermum c) Ectocarpus d) both (a) and (b).

157. A plant having seeds but lacking flowers and fruits belongs to _____.

- a) pteridophytes b) mosses c) ferns d) gymnosperms

158. Fill in the blanks (a), (b) & (c) by observing the characters given in tables and choose the correct answer from the options:-

Class	Major pigments	Stored food	Flagella	Cell wall
(a)	chlorophyll a & b	starch	2-8 equal and apical	Cellulose
(b)	chlorophyll a & c	Mannitol	2, unequal and lateral	Cellulose & Algin
(c)	chlorophyll a & d	Floridean starch	Absent	Cellulose

a) Chlorophyceae, Rhodophyceae, Phaeophyceae

b) Rhodophyceae, Chlorophyceae, Phaeophyceae

- c) Chlorophyceae, Phaeophyceae, Rhodophyceae
d) Rhodophyceae, Phaeophyceae, Chlorophyceae
159. A plant shows thallus level of organisation. It shows rhizoids and is haploid. It needs water to complete its life cycle because the male gametes are motile. It may belong to
a) pteridophytes b) gymnosperms c) monocots d) bryophytes.
160. Find correct Statement for the Prothallus of fern
a) Monoecious, multicellular and parasitic
b) Monoecious, multicellular and photosynthetic
c) Dioecious with unicellular thallus
d) Monoecious, large and differentiated vascular body
161. Planaria possess high capacity of:-
a) Metamorphosis b) Regeneration c) Alternation of generation
d) Bioluminescence
162. Which one of the following plants is monoecious?
a) Pinus b) Cycas c) Papaya d) Marchantia
163. Choose the correct set of bacterial disease
a) Mumps, cholera, dengue b) Chicken pox, typhoid, mumps
c) Mumps, tetanus, chicken pox d) cholera, typhoid, tetanus
164. Aquatic fern which supports the growth of blue green algae, Anabaena, and used to increase the yield of paddy crop is:-
a) Salvinia b) Marsilea c) Isoetes d) Azolla
165. Read the given statements and select the correct option.
Statement 1 Bryophytes show alternation of generation.
Statement 2 A haploid gametophytic generation and a diploid sporophytic generation alternate in the life cycle.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2
d) Both statements 1 and 2 are incorrect
166. Sexual reproduction involving fusion of two cells in Chlamydomonas is _____ .
a) isogamy b) homogamy c) somatogamy d) hologamy
167. Denitrification is done by:-
a) Pseudomonas b) Nitrosomonas c) Nitrobacter d) Nitrococcus
168. Pick up the wrong statement:

- a) Nuclear membrane is present in Monera b) Cell wall is absent in Animalia
c) Protista have photosynthetic and heterophyte modes of nutrition
d) Some fungi are edible
169. Which of the following plants produces seeds but not flowers?
a) Maize b) Mint c) Peepal d) Pinus
170. Compared with the gametophyte of the bryophytes, the gametophytes of vascular plants tend to be:
a) Smaller and to have smaller sex organs
b) Smaller but to have larger sex organs
c) Larger but to have smaller sex organs
d) Larger and to have larger sex organs
171. At least a half of the total CO_2 fixation on Earth is carried out through photosynthesis by:
a) angiosperms b) gymnosperms c) algae d) bryophytes
172. The basidiomycetes includes:-
a) Rusts b) Smuts c) Mushrooms d) All the above
173. A plant producing seeds but lacking flowers is :
a) Gymnosperm b) Bryophyte c) Angiosperm d) Pteridophyte
174. Which one of the following shows isogamy with non-flagellated gametes?
a) Sargassum b) Ectocarpus c) Ulothrix d) Spirogyra
175. Cycas possesses two cotyledons but it is not dicot because of:
a) Compound leaves b) Naked seeds c) Circinate ptyxis
d) Monocot like stem
176. Which one of the following is common to multicellular fungi, filamentous algae and protonema of mosses?
a) Multiplication by fragmentation b) Diplontic life cycle
c) Members of kingdom plantae d) Mode of nutrition
177. The "seaweeds" that form the underwater forest are
a) kelps b) Laminaria c) Macrocystis d) all of these.
178. **Assertion:** Algae show only anisogamous type of reproduction.
Reason: In algae, gametes can never be non flagellated.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

179. The guts of cow and buffalo possess:

a) *Chlorella* spp. b) Methanogens c) Cyanobacteria d) *Fucus* spp.180. In *Pinus*/*Cycas*/gymnosperms, the endosperm is _____.

a) triploid b) haploid c) diploid d) tetraploid

181. Which of the following is true about bryophytes?

a) They possess archegonia b) They contain chloroplast c) They are thalloid
d) All of the above

182. The plant group that produces spores and embryo but lacks vascular tissues and seeds is _____.

a) Pteridophyta b) Rhodophyta c) Bryophyta d) Phaeophyta

183. Which of the following structures are haploid in gymnosperms?

a) Pollen grain, megaspore, embryo b) Pollen grain, megaspore, endosperm
c) Megaspore, leaf, root d) Leaf, root, integument

184. _____ do not have free living gametophyte.

a) Bryophytes b) Pteridophytes c) Gymnosperms d) both (b) and (c)

185. In which organisms external fertilization occurs:-

a) Echinodermata/Moss b) Hemichordata/Fern c) Reptilia/Gymnosperm
d) Amphibia/Algae

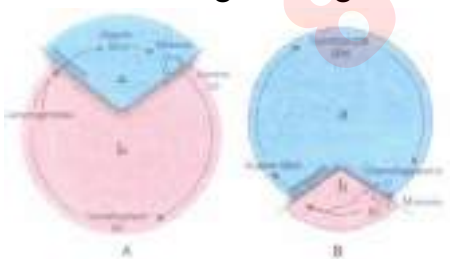
186. Archaeobacteria differ from eubacteria in:

a) Cell membrane b) Mode of nutrition c) Cell shape
d) Mode of reproduction

187. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Sagopalm	(i) <i>Ephedra</i>
B. Chilgoza fruit	(ii) <i>Pinus gerardiana</i>
C. Ephedrine drug	(iii) <i>Cycas revoluta</i>
D. Cedar wood oil	(iv) <i>Juniperus virginiana</i>

- a) A-(iv), B-(ii), C-(i), D-(iii) b) A-(iii), B-(ii), C-(i), D-(iv)
 c) A-(iii), B-(iv), C-(i), D-(ii) d) A-(ii), B-(iii), C-(i), D-(iv).c
188. Cellulose is the major component of cell walls of:-
 a) Pseudomonas b) Saccharomyces c) Pythium d) Xanthomonas
189. What is the ploidy of primary endosperm nucleus (PEN) in angiosperms?
 a) Haploid b) Diploid c) Triploid d) Polyploid
190. Which of the following shows coiled RNA strand and capsomeres?
 a) Polio virus b) Tobacco mosaic virus c) Measles virus d) Retrovirus
191. Which of the following is commonly known as "chilgoza pine"?
 a) Pinus roxburghii b) P.strobilus c) P.gerardiana d) P.sylvestris
192. Carpellets are equivalent to the
 a) Microsporophylls b) Megasporophylls c) Megasporangia d) Embryo sac
193. In most green algae, pyrenoids, the storage bodies, are located in _____.
 a) chloroplasts b) mitochondria c) cytoplasm d) nucleus
194. Choose the correct statement:-
 a)
 Aspergillus niger is bacterium which is used for obtaining acetic acid & citric acid
 b) Streptokinase is used as a clot buster
 c)
 Monascus purpureus is responsible for production of large holes in swiss cheese
 d) Toddy is manufactured by Lactobacillus
195. Refer to the given figure showing life cycle patterns and identify them.



a)

A	B
Diplontic	Haplontic

b)

A	B
Haplontic	Diplontic

c)

A	B
Haplo diplontic	Haplontic

d)

A	B
Haplo- diplontic	Diplontic

196. Which one of the following is commonly used in transfer of foreign DNA into crop plants?
- a) *Penicillium expansum* b) *Trichoderma harzianum*
c) *Meloidogyne incognita* d) *Agrobacterium tumefaciens*
197. A vascular cryptogam is:
- a) *Equisetum* b) *Cedrus* c) *Marchantia* d) *Ginkgo*
198. For higher plants, flowers are chiefly used as a basis of classification, because:-
- a) These show a great variety in colour b) It can be preserved easily
c) Reproductive parts are more conservative than vegetative parts
d) None of these
199. Apophysis in the capsule of *Funaria* is _____.
a) lower part b) upper part c) middle part d) fertile part
200. Cell wall is absent in:
- a) *Nostoc* b) *Aspergillus* c) *Funaria* d) *Mycoplasma*
201. Algae with starch as reserve food material are also characterised by
- a) Presence of chlorophyll b b) Sulphated phycocolloids
c) Nonsulphated phycocolloids d) Nonflagellate nature
202. Which of the following statements is wrong?
- a) *Laminaria* and *Sargassum* are used as food
b) Algae increases the level of dissolved oxygen in the immediate environment
c) Algin is obtained from red algae and carrageen from brown alga.
d) Agar-agar is obtained from *Gelidium* and *Gracilaria*
203. Mayr proposed which type of concept of species:
- a) Taxonomic concept b) Biological concept
c) Taxonomic and Biological concept d) Genetic concept
204. The sporophyte is attached to the gametophyte in
- a) algae b) fungi c) bryophytes d) pteridophytes.
205. Which of the following characters represent the affinities of *Gnetum* with angiosperms and differences with *Cycas* and *Pinus*?
- a) Presence of xylem vessels and absence of archegonia
b) Perianth and two integuments
c) Embryo development and apical meristem
d) Absence of resin ducts and leaf venation
206. Phycoerythrin, chlorophyll a and chlorophyll d are characteristics of
- a) *Phaeophyceae* b) *Xanthophyceae* c) *Chlorophyceae* d) *Rhodophyceae*.
207. Which of the following is homosporous:

- a) Selaginella b) Pinus c) Cycas d) Lycopodium
208. Select the correct combination of the statement (a-d) regarding the characteristics of certain organisms:
- (a) Methanogens are Archaeobacteria which produce methane in marshy areas
 - (b) Nostoc is filamentous blue-green alga which atmospheric nitrogen
 - (c) Chemosynthetic autotrophic bacteria synthesis cellulose from glucose
 - (d) Mycoplasma lack a cell wall and can survive without oxygen
- The correct statements are:
- a) (a), (b), (c) b) (b), (c), (d) c) (a), (b), (d) d) (b), (c)
209. Select the correct statement
- a) Leaves of gymnosperms are not well adapted to extremes of climate.
 - b) Gymnosperms are both homosporous and heterosporous.
 - c) Salvinia, Ginkgo and Pinus are all gymnosperms
 - d) Sequoia is one of the tallest trees
210. Pollen Grain is a reduced
- a) Female gametophyte b) Male Gametophyte c) Young sporophyte
 - d) Parent Sporophyte
211. Which pigment is found in phaeophyceae?
- a) Chl.a, c and fucoxanthin b) Chl.a, d and violaxanthin
 - c) β Carotene and phycocyanin d) None of these
212. Which of the following gymnosperms has branched stems?
- a) Pinus b) Cycas c) Cedrus d) Both (a) and (c)
213. Protonema occurs in the life cycle of _____ .
- a) Riccia b) Funaria c) Chlamydomonas d) Spirogya
214. The gametophyte is not an independent, free living generation in _____ .
- a) Polytrichum b) Adiantum c) Marchantia d) Pinus
215. Read the given statements about algae and select the correct option.
- (i) Plant body is thalloid.
 - (ii) They are largely aquatic.
 - (iii) Reproduction occurs by vegetative, asexual and sexual methods.
 - (iv) Chlamydomonas, Volvox and Ulothrix are the multicellular algae.
- a) Statements (i) and (ii) are true. b) Statements (ii) and (iii) are true.
 - c) Statements (i), (ii) and (iii) are true. d) All statements are true.
216. Flagellated male gametes are present in all the three of which one of the following sets?

- a) Riccia, Dryopteris and cycas b) Athoceros, Funaria and Spirogyra
 c) Zygnema, Saprolegina and Hydrilla d) Fucus, Marsilea and Calotropis

217. In class Phycomycetes the mycelium is:-

- a) Coenocytic and aseptate b) Coenocytic and septate
 c) Uninucleate and aseptate d) Multinucleate and septate

218. choose the incorrect statement about Phycomycetes:-

- a) Members are found in aquatic habits
 b) Spores are endogenously produced in sporangium
 c) A zygospore is formed by reduction division
 d) They show all type of syngamy

219. Match items in Column I with those in Column- II:

Column-I	Column-II
(A) Peritrichous	(J) Ginkgo flagellation
(B) Livingfossil	(K) Macrocystis
(C) Rhizophore	(L) Escherichia coli
(D) Smallest flowering plant	(M) Selaginella
(E) Largest perennial	(N) Wolffia alga

Select the correct answer from the following:

- a) A-L; B-J; C-M; D-N; E-K; b) A-K; B-J; C-L; D-M; E-N
 c) A-N; B-L; C-K; D-N; E-J; d) A-J; B-K; C-N; D-L; E-K

220. Which one of the following is not common between Funaria and Selaginella?

- a) Archegonium b) Embryo c) Flagellate sperms d) Roots

221. The imperfect fungi which are decomposers of and help in mineral cycling belong to:

- a) Ascomycetes b) Deuteromycetes c) Basidiomycetes d) Phycomycetes

222. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Pteris	(i) Bryophyte
B. Cedrus	(ii) Pteridophyte
C. Sonchus	(iii) Gymnosperm
D. Marchantia	(iv) Angiosperm

- a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(ii), B-(i), C-(iv), D- (iii)
c) A-(i), B-(iii), C-(iv). D-(ii) d) A-(iii), B-(iv), C-(ii), D-(i)
23. Which of the following statements about Phaeophyceae is incorrect?
a) Vegetative reproduction occurs by fragmentation.
b) Asexual reproduction is by biflagellate pear-shaped zoospores.
c)
In sexual reproduction, gametes are pyriform and bear 2 laterally attached flagella.
d) None of these
24. Dinoflagellates are called fire algae due to which character:-
a) They appear like fire due to pigments b) They produce fire due to friction
c) They occur on burnt places d) They show bioluminescence
25. Which of the following are not membrane -bouns :
a) Mesosomes b) Vacuoles c) Ribosomes d) Lysosomes
26. In Pinus, endosperm cells have 30 chromosomes then how many chromosomes are present in sieve cells:-
a) 30 b) 60 c) 10 d) 15
27. In a moss the sporophyte:
a) arises from a spore produced from the gametophyte
b) manufactures food for itself, as well as for the gametophyte
c) is partially parasitic on the gametophyte
d) produces gametes that give rise to the gametophyte
28. Green algae usually have a rigid cell wall made of an inner layer of _____ and an outer layer of _____.
a) cellulose, cellulose b) pectose, pectose c) pectose, cellulose
d) cellulose, pectose
29. Seaweeds are a source of
a) chlorine b) fluorine c) bromine d) iodine.
30. Nitrogen fixation in root nodules of Anus is brought about by:-
a) Frankia b) Azorhizobium c) Bradyrhizobium d) Clostridium
31. In pteridophytes, main plant body is a __(i)__ which is __(ii)__ into true roots, stem and leaves.
Fill the blanks in above statement and select the correct option.

a)

i	ii
sporophyte	differentiated

b)

i	ii
sporophyte	not differentiated

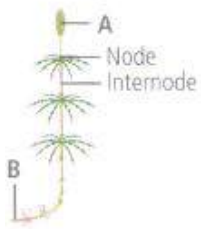
c)

i	ii
gametophyte	differentiated

d)

i	ii
gametophyte	not differentiated

232. Identify the parts labelled as A and B in the given figure of **Equisetum** and select the correct option.



a)

A	B
Strobilus	Rhizome

b)

A	B
Sporophylls	Tuber

c)

A	B
Sporangia	Rhizome

d)

A	B
Sporophyte	Tuber

233. Which one of the following is a living fossil?

a) Pinus b) Opuntia c) Ginkgo d) Thuja

234. The sporophyte is the dominant phase in

a) pteridophytes b) gymnosperms c) angiosperms d) all of these.

235. Select the wrong statement:

a)

Chlamydomonas exhibits both isogamy and anisogamy and Fucus shows oogamy

b) Isogametes are similar in structure, function and behaviour

c) Anisogametes differ either in structure, function or behaviour

d)

In Oomycetes female gamete is smaller and motile, while male gamete is larger and non-motile

236. Two microbes found to be very useful in genetic engineering are:

a) Diplococcus sp. and Pseudomonas sp.

b) Crown gall bacterium and Caenorhabditis elegans

c) Escherichia coli and Agrobacterium tumefaciens

d) Vibrio cholerae and a tailed bacteriophage

237. Black (stem) rust of wheat is caused by:
a) *Ustilago nuda* b) *Puccinia graminis* c) *Xanthomonas oryzae*
d) *Alternaria solani*
238. Which group of plantae represents gametophytic plant body with dependent sporophyte?
a) Algae and bryophytes b) Bryophytes and pteridophytes
c) Liverworts and mosses d) Ferns and Cycads
239. Which of the following are likely to be present in deep sea water?
a) Saprophytic fungi b) Archaeobacteria c) Eubacteria d) Blue-green algae
240. Among the following plant group which have independent gametophyte and sporophyte?
a) Bryophyta b) Pteridophyta c) Gymnosperms d) Angiosperms
241. Megaspore of gymnosperms is homologous to _____ of angiosperms.
a) stamen b) carpel c) sepal d) petal
242. Floridean starch is characteristic feature of :-
a) *Polysiphonia*, *Gracilaria*, *Porphyra* b) *Laminaria*, *Sargassum*, *Porphyra*
c) *Polysiphonia*, *Laminaria*, *Porphyra* d) *Chara*, *Dictyota*, *Polysiphonia*
243. Which one of the following is wrong about *Chara*?
a) Upper oogonium and lower round antheridium
b) Globule and nucule present on the same plant
c) Upper antheridium and lower oogonium
d) Globule is male reproductive structure
244. Nitrifying bacteria:-
a) Oxidize ammonia to nitrates
b) Convert free nitrogen to nitrogen compounds
c) Convert proteins into ammonia d) Reduce nitrates to free nitrogen
245. Embryophyta includes:-
a) Angiosperms only b) Only Pteridophytes c) Bryophyta & Pteridophyta
d) All plants except thallophyta
246. Match the column I with column II

	Column -I		Column-II
(i)	Chlorophyceae	(a)	Ectocarpus
(ii)	Hemichordata	(b)	Chara
(iii)	Phaeophyceae	(c)	Selaginella
(iv)	Liverwort	(d)	Marchantia

- a) i-b, ii-c, iii-a, iv-d b) i-b, ii-d, iii-a, iv-c c) i-a, ii-d, iii-c, iv-b
d) i-c, ii-a, iii-b, iv-d
247. What is the characteristic branching pattern of Dictyota thallus?
a) Monopodial b) Excurrent c) Dichotomous d) Deliquescent
248. Which one is wrongly matched?
a) Gemma cups - Marchantia b) Biflagellate Zoospores - Brown algae
c) Uniflagellate gametes - Polysiphonia d) Unicellular organism - Chlorella
249. Bryophytes differ from thallophytes in having:-
a) Embryo b) Rhizoids c) Sterile jacket around sex organs d) All the above
250. select incorrect statement about viroid:-
a) Free infectious RNA b) It was discovered T.O Diener
c) It causes potato spindle tuber disease
d) It contains high molecular weight RNA
251. Which of the following is responsible for peat formation?
a) Marchantia b) Riccia c) Funaria d) Sphagnum
252. Pyrenoids are the centres for formation of _____.
a) porphyrin b) enzymes c) fat d) starch
253. Which one of the following is not a correct statement?
a) Key is taxonomic aid for identification of specimens
b) Herbarium houses dried, pressed and preserved plant specimens
c) Botanical gardens have collection of living plants for reference
d) A museum has collection of photographs of plants and animals
254. Conifers differ from grasses in the:
a) Production of seeds from ovule b) Lack of xylem tracheids
c) Absence of pollen tubes d) Formation of endosperm before fertilization
255. In gymnosperms, the pollen chamber represents:
a) The microsporangium in which pollen grains develop
b) A cell in the pollen grain in which the sperms are formed
c) A cavity in the ovule in which pollen grains are stored after pollination
d) An opening in the megagametophyte through which the pollen tube approaches the egg
256. Methanogens belong to:-
a) Archaeobacteria b) Eubacteria c) Filamentous bacteria
d) Cyanobacteria
257. The chief water conducting elements of xylem in gymnosperms are:

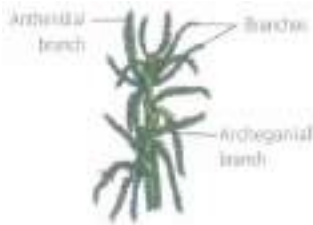
- a) Tracheids b) Vessels c) Fibres d) Transfusion tissue
258. The function of leghaemoglobin in the root nodules of legumes is:-
 a) Inhibition of nitrogenase activity b) Oxygen removal
 c) Nodule differentiation d) Expression of nif gene
259. Fusion of two gametes which are dissimilar in size is termed as
 a) oogamy b) isogamy c) anisogamy d) both (a) and (c).
260. Why the deuteromycetes are called as 'fungi imperfecti'?
 a) Only a sexual or vegetative phases of these fungi are known
 b) Their mycelium is separate and branched c) The help in mineral cycling
 d) The deuteromycetes members may be saprophytes or parasites.
261. In Bryophytes diploid number of chromosomes occur in:-
 a) Gametes b) Spores c) Spore mother cells d) Nuclei of gametes
262. Assertion: Stomata are found on the surface of leaves in gymnosperms.
 Reason: In gymnosperms, cuticle of leaves is thin.
 a)
 If both assertion and reason are true and reason is the correct explanation of assertion.
 b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false.
 d) If both assertion and reason are false.
263. In taxonomic hierarchy families are characterised by
 a) Vegetative features b) Generative features
 c) Both vegetative and floral feature d) Neither vegetative nor floral features
264. Which fungus is used extensively in biochemical and genetic work?
 a) Agaricus b) Aspergillus c) Claviceps d) Neurospora
265. Match the following column correctly:-
- | Column I | Column II |
|----------------|--------------------------|
| A Statins | i Monascus purpureus |
| B Cyclosporins | ii Trichoderma |
| C Acetic acid | iii Acetobacter aceti |
| D Butyric acid | iv Clostridium butyricum |
- a) A-i, B-ii, C-iii, D-iv b) A-ii, B-i, C-iv, D-iii c) A-ii, B-i, C-iii, D-iv
 d) A-iii, B-iv, C-i, D-ii

266. Which of the following are noncellular organisms that are characterized by having an inert crystalline structure outside the living cell:-
a) Bacteria b) Mycoplasma c) virus d) Lichen
267. A well developed archegonium with neck consisting of 4-6 rows of neck canal cells, characterises:
a) gymnosperms only b) bryophytes and pteridophytes
c) pteridophytes and gymnosperms d) gymnosperms and flowering plants
268. An organism used as a biofertilizer for raising soyabean crop is:-
a) Azotobacter b) Azospirillum c) Rhizobium d) Nostoc
269. Ergot of rye is caused by a species of:-
a) Claviceps b) Phytophthora c) Uncinula d) Ustilago
270. Select one of the following pairs of important features distinguishing Gnetum from Cycas and Pinus and showing affinities with angiosperms:-
a) Perianth and two integuments
b) Embryo development and apical meristem
c) Absence of resin duct and leaf venation
d) Presence of vessel elements and absence of archegonia
271. Gymnosperm called as a living fossil is
a) Cycas b) Ginkgo c) Juniperus d) both (a) and (b).
272. Embryo is not formed in thallophyta due to:-
a) Zygotic meiosis b) Zygotic mitosis c) Sporangial meiosis
d) Gametic meiosis
273. In pteridophytes, a spore germinates to produce
a) Sporophyte b) sporogonium c) prothallus d) microsporophyll.
274. Peat moss is
a) Sphagnum b) Dryopteris c) Funaria d) Polytrichum
275. Choose the incorrect statement regarding mycoplasma:-
a) They lack cell wall b) They are smallest living cells
c) They can survive without oxygen d) They have mesosome for respiration
276. Which of the following is odd one from the following about liver worts?
a) Foot, Seta, Capsule b) Spore, Archegonium, Antheridium
c) Protonema, Primary protonema & Secondary protonema
d) Parenchyma, Gemmae, Scales
277. In Chlorophyceae, sexual reproduction occurs by _____.
a) isogamy and anisogamy b) isogamy, anisogamy and oogamy
c) oogamy only d) anisogamy and oogamy

278. In fungi when the hyphae are continuous and branched tubes filled with multinucleated cytoplasm these are called:-

- a) Unicellular hyphae b) Coenocytic hyphae c) Non-Acellular hyphae
- d) Multicellular hyphae

279. Which of the following options correctly identifies the plant shown in figure and the group it belongs to?



- a) Marchantia - Liverwort b) Sphagnum - Moss c) Sphagnum - Liverwort
- d) Funaria - Moss

280. True nucleus is absent in:-

- a) Mucor b) Vaucheria c) Volvox d) Anabaena

281. Gymnosperms

- a) Are Homosporous

b)

Possess a male gametophyte which is highly reduced and is confined to single cell only

- c) possess strobili on same or different trees

d)

Show the presence of female gametophyte which is retained within microsporangium

282. Which one pair of examples, will correctly represent the grouping Spermatophyta according to one of the schemes of classifying plants?

- a) Ginkgo, Pisum b) Acacia, Sugarcane c) Pinus, Cycas
- d) Rhizopus, Triticum

283. Assertion: Gymnosperms do not produce fruit.

Reason: Ovules of gymnosperms are enclosed within the ovaries.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false.

- d) If both assertion and reason are false.

284. Which one is a wrong statement?

- a) Brown algae have chlorophyll a and c, and fucoxanthin
- b) Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms
- c) Mucor has biflagellate zoospores
- d) Haploid endosperm is typical feature of gymnosperms

285. Gametophytic plant body is nonvascular in

- a) Algae and liverworts b) Mosses and ferns
- c) gymnosperms and angiosperms d) All of these

286. Organisms which obtain energy by the oxidation of reduced inorganic compounds are called

- a) Photo autotrophs b) Photo autotrophs c) Saprozoic d) Heterotrophs

287. _____ classification systems were based on evolutionary relationships between various organisms.

- a) Natural b) Artificial c) Phylogenetic d) Both (a) and (b)

288. Consider the following four statements whether they are correct or wrong:

- (a) The sporophyte in liverworts is more elaborate than that in mosses
- (b) Salvinia is heterosporous
- (c) The life-cycle in all seed-bearing plants is diplontic.
- (d) In Pinus male and female cones are borne on different trees.

The two wrong statements together are:

- a) statements (a) and (b) b) statements (a) and (c) c) statements (a) and (d)
- d) statements (b) and (c)

289. A nitrogen fixing microbe associated with Azole in rice-fields is:-

- a) Frankia b) Tolypothrix c) Spirulina d) Anabaena

290. Pteridophytes are divided into how many classes?

- a) Two b) Three c) Four d) Six

291. **Assertion :** In Chlorophyceae, plant body is usually grass green.

Reason : Members of Chlorophyceae, possess chlorophyll a, c, carotenoids and xanthophyll.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

292. Which group shows the most extensive metabolic diversity?

- a) Plantae b) Animalia c) Monera d) Fungi

293. The cyanobacteria are also referred to as:-

- a) Slime moulds b) Blue green algae c) Protists d) Golden algae

294. Agar-agar is commercially obtained from

- a) green algae b) blue-green algae c) brown algae d) red algae.

295. Sexual reproduction in Spirogyra is an advanced feature because it shows

- a) physiologically differentiated sex organs.
b) different sizes of motile sex organs. c) same size of motile sex organs.
d) morphologically different sex organs.

296. Identify the plants shown in figure and select the correct option.



a)

A	B
Equisetum	Fern

b)

A	B
Equisetum	Fern

c)

A	B
Selaginella	Salvinia

d)

A	B
Equisetum	Fern

297. In angiosperms, functional megaspore develops into

- a) embryo sac b) ovule c) endosperm d) pollen sac.

298. Ringworm in humans is caused by :

- a) Viruses b) Bacteria c) Fungi d) Nematodes

299. Which of the following are not included in the five kingdom system of classification?

- (a) Viruses
(b) Viroid
(c) Lichen

- a) a and b b) b and c c) a and c d) a, b and c

300. Which type of sexual reproduction is found in Volvox?

- a) Isogamous b) Anisogamous c) Oogamous d) All of these

301. Each character is given equal importance and at the same time hundreds of characters can be considered in:

- a) cytotaxonomy b) morphotaxonomy c) chemotaxonomy
d) numerical taxonomy.

302. The gametophyte of pteridophytes require to grow:-
a) Warm, damp, and shady place b) Cool, damp and shady place
c) Warm, dry, and shady place d) cool, dry, and place of well sunshine
303. The 'walking fern' is so named because _____.
a) it is dispersed through the agency of walking animals
b) it propagates vegetatively by its leaf tips c) it knows how to walk by itself
d) its spores are able to walk
304. Maximum nutritional diversity is found in the group:-
a) Monera b) Plantae c) Fungi d) Animalia
305. Besides paddy field, cyanobacteria are also found inside vegetative part of:
a) Psilotum b) Pinus c) Cycas d) Equisetum
306. The "seaweeds" that form the under water forest are:
a) kelps b) Laminaria c) Macrocystis d) all of these.
307. Which of the following unicellular algae reproduce by auxospores, have silicified cell wall and store food in the form of fats, leucosine and chrysolaminarin?
a) Diatoms b) Res algae c) Dinoflagellates d) Euglenoids
308. The sequencing of DNA and chemical nature of proteins have been used as the basis of classification by a
a) Cytotaxonomist b) karyotaxonomist c) chemotaxonomist
d) α - taxonomist
309. The antherozoids of Funaria are _____.
a) Aciliated b) Biflagellated c) Multiciliated d) Monociliated
310. Male gametes are flagellated in _____.
a) Anabaena b) Ectocarpus c) Spirogyra d) Polysiphonia
311. Algin can be obtained from:-
a) Rhodophyceae & Chlorophyceae b) Phaeophyceae & rhodophyceae
c) rhodophyceae only d) Phaeophyceae only
312. Natural systems of classification take into consideration
a) morphological and anatomical characters
b) morphological and anatomical characters
c) physiological and reproductive characters d) all of these.
313. Which one of the following is a slime mould?
a) Anabaena b) Rhizopus c) Physarum d) Thiobacillus
314. Heterosporous pteridophytes show certain characteristics, which are precursor to the 'seed habit' in gymnosperms. One of such characteristics is

- a) presence of vascular tissues b) external water required for fertilisation
c) presence of embryo stage
d) development of embryo inside the female gametophyte.
315. Which of the following is a symbiotic nitrogen fixer?
a) Azolla b) Glomus c) Azotobacter d) Frankia
316. Ethanol is commercially produced through a particular species of:-
a) Saccharomyces b) Clostridium c) Trichoderma d) Aspergillus
317. cone bearing Pteridophyta are:-
a) Lycopsida and Psilopsida b) Filicinae and Lycopsida
c) Filicinae and Sphenopsida d) Lycopsida and Sphenopsida
318. Armoured cell wall and biflagellated cells are characteristic of:-
a) Chrysophyta b) Pyrrophyta c) Euglenophyta d) Cyanophyta
319. Gemmae are multicellular green structures for vegetative propagation. These are found inside gemma cups in
a) Riccia capsule b) Marchantia thallus c) Funaria protonema
d) Polytrichum thallus.
320. Pinus differs from mango in having _____.
a) tree habit b) green leaves c) ovules not enclosed in ovary d) wood
321. Read the following five statements (A to E) and select the option with all correct statements:-
(A) Mosses and Lichens are the first organisms to colonise a bare rock
(B) Selaginella is a homosporous pteridophyte
(C) Coralloid roots in cycas have VAM
(D) Main plant body in bryophytes is gametophytic, whereas in pteridophytes it is sporophytic
(E) In gymnosperms, male and female gametophytes are present are within sporangia located on sporophyte
a) (B), (C) and (D) b) (A), (D) and (E) c) (B), (C) and (E) d) (A), (C) and (D)
322. Which out of the following are included under Tracheophyta, i.e., vascular plants?
a) Pteridophytes b) Gymnosperms c) Angiosperms d) All of these
323. Two plants can be conclusively said to belong to the same species if they:
a) Have same number of chromosomes
b) Can reproduce freely with each other and form seeds
c) Have more than 90 percent similar genes
d) Look similar and possess identical secondary metabolites

324. Pinus seed cannot germinate and establish without fungal association. This is because _____ .
- a) It has obligate association with mycorrhizae.
 - b) It has very hard seed coat.
 - c) Its seeds contain inhibitors that prevent germination.
 - d) Its embryo is immature.
325. **Assertion:** In angiosperms, each cell of the embryo sac is haploid.
Reason: In angiosperms, embryo sac formation is preceded by meiosis.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
 - b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c)
If both assertion and reason are true but reason is not the correct explanation of assertion.
 - d) If both assertion and reason are false.
326. Evolution of seed habit first started in:-
- a) Selaginella like ancestral pteridophytes
 - b) Psilotum like ancestral pteridophytes
 - c) Gymnosperms
 - d) Mosses
327. Casparian strips occur in _____ .
- a) Cortex
 - b) Pericycle
 - c) Epidermis
 - d) Endodermis
328. Adiantum is called "walking fern" due to:-
- a) Power of locomotion
 - b) Vegetative reproduction
 - c) Motile antherozoites
 - d) All the above
329. Plants of this group are diploid and well adapted to extreme conditions. They grow bearing sporophylls in compact structures called cones. The group in reference is
- a) monocots
 - b) dicots
 - c) pteridophytes
 - d) gymnosperms.
330. Seed plants are all
- a) heterosporous
 - b) dioecious
 - c) monoecious
 - d) homosporous.
331. Largest sperms in the plant world are found in _____ .
- a) Pinus
 - b) Banyan
 - c) Cycas
 - d) Thuja
332. Which of the following statements is correct?
- a) Horsetails are gymnosperms
 - b) Selaginella is heterosporous, while Salvinia is homosporous

- c) Ovules are not enclosed by ovary wall in gymnosperms
d) Stems are usually unbranched in both Cycas and Cedrus
333. Which of the following pairs is of unicellular algae?
a) Anabaena and volvox b) Chlorella and spirulina
c) Laminaria and Sargossum d) Gelidium and Gracilaria
334. Which of the following statements is incorrect about Cycas?
a) It has unbranched stem. b) It possesses pinnately compound leaves.
c) It is a dioecious plant. d) It is a non-archegoniate plant.
335. Read the following statements (A-E) and answer the question which follows them.
(a) In liverworts, mosses and ferns gametophytes are free living
(b) Gymnosperms and some ferns are heterosporous
(c) Sexual reproduction in Fucus, Volvox and Allbugo is oogamous
(d) The sporophyte in liverworts is more elaborate than that in mosses
(e) Both, Pinus and Marchantia are dioecious
How many of the above statements are correct?
a) Four b) one c) Two d) Three
336. The 'wing' of Pinus seed is derived from _____.
a) testa b) testa and tegmen c) surface of ovuliferous scale
d) All of the above
337. Which of the statements regarding haplontic life cycle is incorrect?
a) Sporophytic generation is represented only by the one-celled zygote.
b) There is no free-living sporophyte.
c) Mitosis in the zygote results in the formation of haploid spores.
d) The haploid spores divide mitotically and form the gametophyte.
338. In which group of organisms the cells walls for two thin overlapping shells which fit together
a) Slime moulds b) Chrysophytes c) Euglenoids d) Dinoflagellates
339. System of classification that employs numerical data to evaluate similarities and differences is known as
a) cytotaxonomy b) biosystematics c) phenetics d) phenetics
340. Bryophytes are amphibians because _____.
a) they require a layer of water for carrying out sexual reproduction
b) they occur in damp places c) they are mostly, aquatic d) All of the above
341. Which of the following has proved helpful in preserving pollen as fossils?
a) Oil content b) Cellulosic intine c) Pollenkitt d) Sporopollenin

342. One gene-one enzyme relationship was established for the first time in:-
a) *Diplococcus pneumoniae* b) *Neurospora crassa*
c) *Salmonella typhimurium* d) *Escherichia Coli*
343. _____ systems of classification were based on natural affinities among the organisms.
a) Artificial b) Natural c) Phylogenetic d) Sexual
344. **Assertion:** In diplontic life cycle, gametophyte is dominant.
Reason: In diplontic life cycle, there is no free living sporophyte.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
345. Most reduced gametophyte generation is found in:-
a) Bryophyta b) Pteridophyta c) Gymnosperms d) Angiosperms
346. Which one of the following pairs is wrongly matched?
a) Coliforms-Vinegar b) Methanogens-Gobar gas c) Yeast-Ethanol
d) Streptomyces-Antibiotic
347. Protonema is
a) haploid and is found in mosses b) diploid and is found in liverworts
c) diploid and is found in pteridophytes
d) haploid and is found in pteridophytes
348. Which of the following character is similar in cyanobacteria and green plants?
a) Cell wall(composition) b) Chlorophyll 'a' c) Nif gene d) 80s ribosome
349. Curing of tea leaves is brought about by the activity of :
a) virus b) fungi c) bacteria d) mycorrhiza
350. Which group of organisms is responsible for the production of biogas from the dung of cows and buffaloes?
a) *Methanomonas* b) Methanogens c) Cyanobacteria d) Mycoplasma
351. Protista is similar to Plantae and different from monera in:-
a) Mode of nutrition b) Cellular grade of organization c) Nuclear membrane
d) Cell wall
352. Resemblances between algae and bryophytes include

- a) presence of root-like, stem-like and leaf-like structures
b) thallus-like plant body, lack of vascular tissue, autotrophic nutrition
c) thallus-like plant body, presence of vascular tissue, autotrophic nutrition
d) presence of roots, heterotrophic nutrition.
353. Which are chief producers of oceans?
a) Diatoms b) Dinoflagellates c) Euglenoid d) Green algae
354. Division "Tracheophyta" includes:-
a) Bryophyta b) All vascular plants c) All non-vascular plants
d) All non-vascular and vascular plants
355. Unique features of bryophytes is that they _____.
a) produce spores b) have sporophyte attached to gametophyte
c) lack roots d) lack vascular tissues
356. Pteridophyta differs from bryophyta in having:-
a) Vascular tissue b) Archegonia c) Alternation of generations
d) Motile sperm
357. Study the given statements about gymnosperms and select the correct option.
(i) Mode of fertilisation is siphonogamy.
(ii) Male and female cones are borne on same tree in Pinus.
(iii) Endosperm represents female gametophyte.
a) Statements (i) and (ii) are correct. b) Statements (ii) and (iii) are correct.
c) Statements (i) and (iii) are correct d) Statements (i), (ii) and (iii) are correct.
358. A moss sperm moves by means of
a) pseudopodia b) cilia c) flagella d) any of these
359. The "endosperm" of a gymnosperm represent:-
a) Gametophytic tissue b) Sporophytic tissue
c) Tissue formed by double fertilization d) Polyploid tissue
360. Identify the gymnosperms shown in figure and select the correct option.



a)

A	B	C
Cyeas	Cedrus	Ginkgo

b)

A	B	C
Pinus	Cyeas	Cedrus

c)

A	B	C
Ginkgo	Pinus	Cyeas

d)

A	B	C
Cyeas	Ginkgo	Pinus

361. Asexual reproduction in liverworts takes place by
a) fragmentation of thalli and gemmae formation
b) gemmae formation and diploid spore formation
c) spores formation and isogamy d) fragmentation and zoospore formation.
362. Which one of the following is heterosporous?
a) Adiantum b) Equisetum c) Dryopteris d) Salvinia
363. What is the chromosomes number in rhizoid, egg cells, capsule and protonema, if leaf cell of bryophyte contains 10 chromosomes?
a) 10, 10, 20 and 10 respectively b) 10, 20, 20 and 10 respectively
c) 20, 10, 20 and 10 respectively d) 10, 10, 20 and 20 respectively
364. The pathogen *Microsporum* responsible for ringworm disease in humans belongs to the same kingdom of organisms as that of:
a) *Ascaris*, a round worm b) *Taenia*, a tapeworm
c) *Wuchereria*, a filarial worm d) *Rhizopus*, a mould
365. *Ulothrix* filaments produce _____.
a) isogametes b) anisogametes c) heterogametes d) basidiospores
366. Cyanobacteria are classified under
a) Protista b) Plantae c) Monera d) Algae.
367. Phycoerythrin is present in
a) *Euglena* b) *Polysiphonia* c) *Chlamydomonas* d) *Fucus*.
368. Seed habit first originated in _____.
a) certain ferns b) certain pines c) certain monocots d) primitive dicots
369. An alga very rich in protein is _____.
a) *Spirogyra* b) *Ulothrix* c) *Oscillatoria* d) *Chlorella*
370. Monoecious plant of *Chara* shows occurrence of:
a) Upper oogonium and lower antheridium on the same plant
b) antheridiophore and archegoniophore on the same plant
c) stamen and carpel on the same plant
d) upper antheridium and lower oogonium on the same plant
371. Which of the following structures is not found in prokaryotic cells?
a) Plasma membrane b) Nuclear envelope c) Ribosome d) Mesosome
372. In pteridophytes, prothallus produces
a) sporangia b) antheridia and archegonia c) vascular tissues
d) root, stem and leaf.
373. Anoxygenic photosynthesis is characteristic of:
a) *Rhodospirillum* b) *Spirogyra* c) *Chlamydomonas* d) *Ulva*

374. In *Pinus*, the pollen grain has 6 chromosomes then its endosperm will have the chromosome _____ .
 a) 2 b) 18 c) 6 d) 24
375. Moss peristome takes part in _____.
 a) spore dispersal b) photosynthesis c) protection d) absorption
376. *Neurospora*, which is popularly known as *Drosophila* of plant kingdom, belongs to:-
 a) *Phycomycetes* b) *Ascomycetes* c) *Basidiomycetes* d) *Seuteromycetes*
377. Which one has the largest gametophyte?
 a) *Cycas* b) *Angiosperm* c) *Selaginella* d) Moss
378. Canada balsam, a mounting agent used to make permanent slides, is obtained from the species of
 a) *Abies* b) *Cedrus* c) *Pinus* d) *Juniperus*
379. Identify the given figures of algae and select the correct option.



a)

A	B
<i>Fucus</i>	<i>Polysiphonia</i>

b)

A	B
<i>Dictyota</i>	<i>Polysiphonia</i>

c)

A	B
<i>Dictyota</i>	<i>Porphyra</i>

d)

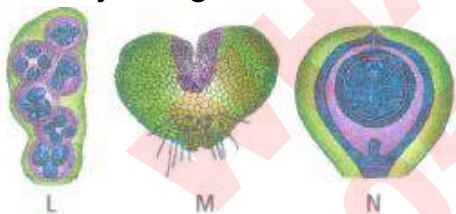
A	B
<i>Porphyra</i>	<i>Polysiphonia</i>

380. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. <i>Psilopsida</i>	(i) <i>Psilotum</i>
B. <i>Lycopsida</i>	(ii) <i>Equisetum</i>
C. <i>Sphenopsida</i>	(iii) <i>Selaginella</i>
D. <i>Pteropsida</i>	(iv) <i>Dryopteris</i>

- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(i), B-(iv), C-(iii), D-(ii)
 c) A-(i), B-(iii), C-(ii), D-(iv) d) A-(i), B-(iii), C-(iv), D-(ii)
381. In _____, a dominant and independent diploid sporophyte alternates with a short-lived, independent haploid gametophyte.
 a) algae b) bryophytes c) pteridophytes d) gymnosperms
382. The members of *Phaeophyceae* or brown algae are found primarily in/on

- a) freshwater b) marine habitat c) terrestrial habitat d) rock.
383. Male and female gametophytes are independent and free-living in:
a) Sphagnum b) Mustard c) Castor d) Pinus
384. Filamentous unbranched thallus is found in
a) Chlamydomonas b) Cladophora c) Volvox d) Spirogyra
385. In the five-kingdom classification, Chlamydomonas and Chlorella have been included in:
a) Plantae b) Monera c) Protista d) Algae
386. Which kind of life-cycle pattern is exhibited by seed-bearing plants?
a) Haplontic b) Diplontic c) Haplo-diplontic d) All of these
387. The heterosporous pteridophytes are
a) Lycopodium and Pteris b) Selaginella and Psilotum
c) Selaginella and Salvinia d) Dryopteris and Adiantum
388. Which out of the following does not belong to brown algae?
a) Gelidium, Batrachospermum b) Ectocarpus, Dictyota c) Laminaria, Fucus
d) Sargassum, Ectocarpus
389. Plants having haplontic life cycle shows
a) Sporic meiosis b) Zygotic Meiosis c) Gametic meiosis d) Both (1) & (2)
390. Identify the given structures and select the correct option



a)

L	M	N
Aplanospore of Ulothrix	Prothallus (2n) of pteridophyte	Ovule of angiosperm

b)

L	M	N
Palmella stage of Ulothrix	Prothallus (n) of bryophyte	Ovule of gymnosperm

c)

L	M	N
Akinetes of Chlamydomonas	Sporophyte (2n) of bryophyte	Endosperm of gymnosperm

d)

I	M	N
Palmella stage of Chlamydomonas	Prothallus (n) of pteridophyte	Ovule of gymnosperm

391. Male and female gametophytes do not have free independent existence in:
a) Pteris b) Cedrus c) Polytrichum d) Funaria
392. Which of the following characters indicate similarity between fungi and animals?
a) Heterotrophic nutrition b) Type of stored food c) Presence of chitin
d) All the above
393. Which of the following is not correctly matched for the organism and its cell wall degrading enzyme?
a) Fungi-Chitinase b) Bacteria-Lysozyme c) Plant cells-Cellulase
d) Algae-Methylase
394. Bryophytes are dependent on water because _____.
a) water is essential for fertilisation for their homosporous nature
b) water is essential for their vegetative propagation
c) the sperms can easily reach up to egg in the archegonium
d) archegonium has to remain filled with water for fertilisation
395. Brown algae is characterised by the presence of _____.
a) phycocyanin b) phycoerythrin c) fucoxanthin d) haematochrome
396. Which one of the following fungi contains hallucinogens?
a) Morchella esculenta b) Amanita muscaria c) Neurospora sp.
d) Ustilago sp.
397. Which of the following propagates through leaf-tip?
a) Walking fern b) Sproux-leaf plant c) Marchantia d) Moss
398. Peat Moss is used as a packing material for sending flowers and live plants to distant places because _____.
a) it is hygroscopic. b) it reduces transpiration. c) it serves as a disinfectant.
d) it is easily available.
399. Euglenoids have a protein rich layer instead of cell wall This layer is called as:-
a) Cellulose b) Chitin c) Pellicle d) Pectin
400. Isogamous condition with non-flagellated gametes is found in :
a) Fucus b) Chlamydomonas c) Spirogyra d) Volvox
401. The basic smallest unit of classifications is:-
a) Genus b) Species c) Order d) All of these

102. Which one of the following is not an inclusion body found in prokaryotes?
a) Cyanophycean granule b) Glycogen granule c) Polysome
d) Phosphate granule
103. Compared with the gametophytes of the bryophytes the gametophytes of vascular plant are _____.
a) Smaller but have larger sex organs b) Larger but have smaller sex organs
c) Larger and have larger sex organs d) Smaller and have smaller sex organs
104. Monographs are concerned with:
a) Information of any species only b) Information of any genus only
c) Information of any family only d) Information of any family only
105. Which of the following cannot fix nitrogen?
a) Nostoc b) Azotobacter c) Spirogyra d) Anabaena
106. Which one of the following is a correct statement?
a) Antheridiophores and archegoniophores are present in pteridophytes
b) Origin of seed habit can be traced in pteridophytes
c) pteridophyte gametophyte has a protonemal and leafy stage
d) In gymnosperms female gametophyte is free living
107. The dominant Phase in the life Cycle of pteridophyta is nutritionally equivalent to the
a) gametophytic phase of bryophyta b) Sporophytic Phase of Bryophyta
c) Gametophytic Phase of angiosperm
d) Gametophytic Phase of Gymnosperm
108. A leafy gametophyte plant with multicellular rhizoids and sporophyte differentiated in foot, seta and capsule should belong to:-
a) Psilopsida b) Hepaticopsida c) Bryopsida d) Lycopsida
109. Which of the following is an aquatic fern?
a) Adiantum b) Dryopteris c) Salvinia d) Equisetum
110. Which of the following statements regarding nomenclature is correct?
a)
Generic name always begins with capital letter whereas specific epithet with small letter
b) Scientific name always should be printed in italics
c) Scientific name when typed or handwritten should be separately underlined
d) All the above
111. Which of the following suffix is always correct for taxonomic categories without any exception?

- a) "-ia" for class like in class Mammalia b) "-ca" for genus like in genus Musca
- c) "-ceae" for family like is family poaceae
- d) "-oda" for phylum like in phylum Arthropoda

I12. **Assertion:** Spores in mosses are contained within the capsule.

Reason: Spores are formed by mitotic division in mosses.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

I13. The thalloid body of a slime mould (Myxomycetes) is known as:

- a) Fruit body b) Mycelium c) Protonema d) Plasmodium

I14. Which statement is correct about mosses?

- a) They have dominant and independent sporophyte
- b) Their antherozoids require water for fertilisation
- c) Their archegonia produce many eggs
- d) Their antherozoids are multiflagellated

I15. **Assertion:** In gymnosperms, the male and female gametophytes do not have independent existence.

Reason: They remain within the sporangia retained on the sporophyte.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

I16. In double fertilisation, one male gamete fuses with the ____ (i) ____ form zygote and the other male gamete fuses with ____ (ii) ____ form primary endosperm nucleus.

- a) synergids (n), antipodals (n) b) egg (n), antipodals
- c) egg (n), secondary nucleus (2n) d) egg (n), synergids (n)

I17. Gemmae are asexual reproductive bodies of

- a) brown algae b) mosses c) liverworts d) red algae
118. Infoldings of plasma membrane in bacteria are called as:-
a) Episomes b) Plasmid c) Pili d) Mesosomes
119. Which one of the following is not the ecological importance of moss plants?
a)
Some mosses provide food for herbaceous mammals birds and other animals
b)
Very high water holding capacity of mosses is useful for trans-shipment of living materials
c) Mosses along with lichens are the pioneering organisms to colonise rocks
d) Mosses form dense mats on the soil and reduce the impact of falling rain.
120. Batrachospermum is a
a) red algae of sea b) brown algae c) blue algae d) red algae of freshwater
121. Archaeobacterial cell lacks:-
a) Peptidoglycan b) DNA c) Ribosomes d) Branched Chain Lipids
122. Which one of the following is considered important in the development of seed habit?
a) Heterospory b) Haplontic life cycle c) Free-living gametophyte
d) Dependent sporophyte
123. Which one of the following has haplontic life cycle
a) Wheat b) Funaria c) Polytrichum d) Ustilago
124. In Whittaker's five kingdom classification, eucaryotes were assigned to:-
a) All the five kingdom b) Only four of the five kingdoms
c) Only three kingdom d) Only one kingdom
125. Strobili or cones are found in _____.
a) Marchantia b) Equisetum c) Salvinia d) Pteris
126. Chief merit of Bentham and Hooker's classification is that:-
a) It is a system mostly based on evolutionary
b) It is a natural system of classification of all groups of plants
c) The description of the taxa are based on actual observation of the specimen
d) It also considers the phylogenetic aspects
127. In which one of the following, male and female gametophytes do not have free living independent existence?
a) Polytrichum b) Cedrus c) Pteris d) Funaria

128. Read the given statements and select the correct option.

Statement 1: Each sperm of moss has two flagella.

Statement 2: Water is essential for fertilisation in mosses.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct
- d) Both statements 1 and 2 are incorrect

129. Angiosperms A and B shown in the figure belong to the Class _ and _ respectively.

a)

A	B
Dicotyledonae	Monocotyledonae

b)

A	B
Monocotyledonae	Monocotyledonae

c)

A	B
Monocotyledonae	Monocotyledonae

d)

A	B
Dicotyledonae	Dicotyledonae

130. Choose the incorrect statement from following

- a) Dinoflagellates have stiff cellulose plates on the outer surface
- b) Euglenoids have two flagella, one lies longline dinally and the other transversely
- c) Slime mould's spores are dispersed by currents
- d) In diatoms the cell walls form two overlapping shells

131. The Plant used as an alternative of cotton:-

- a) Sphagnum b) Funaria c) Riccia d) Andria

132. Read the given statements and select the correct option.

Statement 1: Volvox forms spherical colony.

Statement 2: Volvox colony is made up of non-motile cells.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

133. Which of the following statements is incorrect?

- a) Mosses along with lichens are the first organisms to colonise rocks.
- b) Sphagnum is used as packing material for transportation of living material.
- c) In liverworts, spores are produced after meiosis within the capsule.
- d) Funaria possesses unicellular unbranched rhizoids.

I34. The most abundant prokaryotes helpful to humans in making curd from milk and in production of antibiotics are ones categorised as:
a) Chemosynthetic autotrophs b) Heterotrophic bacteria c) Cyanobacteria
d) Archaeobacteria

I35. Incorrect Statement in relation to the artificial system of classification is
a) Used only gross morphological characters
b) Based mainly on vegetative characters or androecium structure
c) Gave more preference to sexual characteristics
d) Separated closely related species as they were based on a few characters

I36. The given figure shows a



- a) Selaginella leaf b) Psilotum leaf c) Adiantum plant d) Dryopteris plant
- I37. If you are asked to classify the various algae into distinct groups, which of the following characters you should choose?
a) Chemical composition of the cell wall
b) Types of pigments present in the cell
c) Nature of stored food materials in the cell
d) Nature of stored food materials in the cell
- I38. Male gametophyte in angiosperms produces:
a) Three sperms b) two sperms and a vegetative cell
c) Single sperm and a vegetative cell d) Single sperm and two vegetative cells
- I39. Which one of the following statements about Cycas is incorrect?
a) It does not have a well organised female flower b) It has circinate venation
c) Its xylem is mainly composed of xylem vessels
d) Its roots contain some blue-green algae
- I40. Flagellated cells are absent in:-
a) Red algae b) Blue green algae c) Higher seed plants d) All the above
- I41. Deepest algae in sea are:-
a) Red Algae b) Brown Algae c) Green Algae d) Golden Algae
- I42. Select the incorrect pair.
a) Numerical taxonomy - All observable characteristics
b) Cytotaxonomy - Cytological information

- c) Chemotaxonomy - Chromosome number and structure.
d) Cladistic taxonomy - Origin from a common ancestor
143. Read the given statements and select the incorrect ones.
(i) Sporophyte in mosses is more elaborate than that in liverworts.
(ii) *Salvinia* is homosporous.
(iii) Life-cycle in all spermatophytes is diplontic.
(iv) In *Cycas*, male cones and megasporophylls are borne on the same trees.
a) (i) and (ii) b) (i) and (iii) c) (ii) and (iv) d) (iii) and (iv)
144. Prothallus (gametophyte) gives rise to fern plant (sporophyte) without fertilisation. It is _____.
a) apospory b) apogamy c) parthenocarpy d) parthenogenesis
145. Which one of the wrong pairing for the disease and its causal organism?
a) Root-knot of vegetables-*Meloidogyne* sp
b) Late blight of potato-*Alternaria solani*
c) Black rust to wheat - *Puccinia graminis*
d) Loose smut of wheat - *Ustilago nuda*
146. Sperms of both *Funaria* and *Pteris* were released together near the archegonia of *Pteris*. Only *Pteris* sperms enter the archegonia as _____.
a) *Pteris* archegonia repel *Funaria* sperms
b) *Funaria* sperms get killed by *Pteris* sperms
c) *Funaria* sperms are less mobile
d) *Pteris* archegonia release chemical to attract its sperms
147. Plant classification as proposed by Carolus Linnaeus was artificial because it was based on
a) only a few morphological characters b) all the possible characters
c) anatomical characters which are adaptive in nature
d) physiological and morphological characters
148. The moss which forms dense extensive mats on the soil prevents
a) uprooting of trees b) soil erosion c) falling of leaves
d) evaporation of water from the soil.
149. Key, a taxonomical aid, used for identification of plants and animals based on similarities and dissimilarities its each statement is called:
a) Couplet b) Lead c) Choice d) Indented
150. Fill in the blanks a, b, c and d by observing the characters given in the table and choose the correct answer from the options:-

Plant group	Main body	Fertilisation	Vascular tissue	Female sex organ
-------------	-----------	---------------	-----------------	------------------

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Bryophyte	Gametophyte	Zoodiogamy	Absent	(c)
Pteridophyta	(a)	Zoodiogamy	(b)	Archegonium
Gymnosperm	Sporophyte	Siphnogamy and zoodiogamy	Present	(d)

a)

a	b	c	d
Sporophyte	Present	Archegonium	Archegonium

b)

a	b	c	d
Sporophyte	Absent	Oogonium	Archegonium

c)

a	b	c	d
Gametophyte	Present	Archegonium	Carpel

d)

a	b	c	d
Gametophyte	Present	Archegonium	Carpel



Ravi Maths Tuition Centre

Time : 1 Mins

ANIMAL KINGDOM 1

Marks : 1194

1. Malpighian tubules are _____.
a) excretory organs of insects b) excretory organs of annelids
c) respiratory organs of insects d) respiratory organs of annelids
2. What is true about all sponges without exception?
a) They are all marine b) They have flagellated collar cells
c) They have a mixed skeleton consisting of spicules and spongin fibres
d) They reproduce only asexually by budding
3. What is common among silver fish, scorpion, crab and honeybee?
a) Compound eyes b) Poison glands c) Jointed appendages
d) Metamorphosis
4. How do you differentiate a butterfly from a moth?
a) Moth has feathery antennae but butterfly has club shaped antennae
b) Moth has one pair of wings but butterfly has two pairs of wings.
c) Moth is diurnal but butterfly is nocturnal.
d) Moth has simple eyes but butterfly has compound eyes.
5. In which of the following, segmentation in the body is first observed?
a) Annelida b) Platyhelminthes c) Aschelminthes d) Arthropoda
6. During its life-cycle, Fasciola hepatica (liver fluke) infects its intermediate host and primary host at the following larval stages respectively:
a) miracidium and metacercaria b) redia and miracidium
c) cercaria and redia d) metacercaria and cercaria
7. Kidney of adult rabbit is _____.
a) pronephros b) metanephros c) mesonephros d) opisthonephros
8. Select the correct sequence of organs in the alimentary canal of cockroach starting from mouth
a) Pharynx → Oesophagus → Gizzard → Crop → Ileum → Colon → Rectum
b) Pharynx → Oesophagus → Gizzard → Ileum → Crop → Colon → Rectum
c) Pharynx → Oesophagus → Ileum → Crop → Gizzard → Colon → Rectum
d) Pharynx → Oesophagus → Crop → Gizzard → Ileum → Colon → Rectum

9. All vertebrates possess.
 a) renal portal system b) dorsal, hollow, central nervous system
 c) four chambered ventral heart d) Pharyngeal gill slits
10. Select the Taxon mentioned that represents both marine and fresh water species:
 a) Echinoderms b) Ctenophora c) Cephalochordata d) Cnidaria
11. Match column I with column II and select the correct option from the given codes.

Column I		Column II
A. Labeo rohita	(i)	Red junglefowl
B. Gallus gallus	(ii)	Rohu
C. Bos indicus	(iii)	Tussar silkmoth
D. Antheraea mylitta	(iv)	Cattle

- a) A-(ii), 8-(iii), C-(i), D-(iv) b) A-(iii), 8-(i), C-(iv), D-(ii)
 c) A-(ii), 8-(i), C-(iv), D-(iii) d) A-(ii), 8-(i), C-(iii), D-(iv)
12. The given figures (A - D) show four animals. Select the correct option with respect to a common characteristic of any two of these animals.



- a) A and D respire mainly through body wall.
 b) B and C show radial symmetry.
 c) A and B have cnidoblasts for self-defence. d) C and D have a true coelom
13. Which of the following statements are incorrect?
 (i) Parapodia are lateral appendages in arthropods used for swimming.
 (ii) Radula in molluscs are structures involved in excretion.
 (iii) Aschelminthes are dioecious.
 (iv) Echinoderm adults show radial symmetry.
 (v) Ctenophorans are diploblastic.
 a) (i) and (ii) b) (i) and (iii) c) (i), (iv) and (v) d) (iii) and (v)
14. Earthworm possesses hearts _____.
 a) 6 pair b) 4 pair c) 2 pair d) 1 pair
15. Fire bellied toad is _____.
 a) Amphiuma b) Bombinator c) Necturus d) Salamandra
16. Match the columns and select the correct option.

Column I		Column II
A. Octopus	(i)	Limbs

B. Crocodile	(ii)	Comb plates
C. Gatta	(iii)	Arms
D. Gtenoplana	(iv)	Fins

- a) A-(ii), B-(i), C-(iii), D-(iv) b) A-(iv), B-(ii), C-(i), D-(iii)
 c) A-(i), B-(iii), C-(ii), D-(iv) d) A-(iii), B-(i), C-(iv), D-(ii)

17. Match column I with column II and select the correct option from the given codes.

Column I		Column II
A. Cyclostomes	(i)	Hemichordata
B. Aves	(ii)	Urochordata
C. Tunicates	(iii)	Agnatha
D. Balanoglossus	(iv)	Pisces
E. Osteichthyes	(v)	Tetrapod

- a) A-(i), B-(ii), C-(iii), D-(iv), E-(v) b) A-(ii), B-(iii), C-(iv), D-(i), E-(v)
 c) A-(iii), B-(v), C-(ii), D-(i), E-(iv) d) A-(iii), B-(i), C-(v), D-(ii), E-(iv)

18. One example of animals having a single opening to the outside that serves both as mouth as well as anus is

- a) Fasciola b) Octopus c) Asterias d) Ascidia

19. Which one of the following is not typical of the class-mammalia?

- a) Seven cervical vertebrae b) Thecodont dentition
 c) Ten pairs of cranial nerves d) Alveolar lungs

20. The organisms attached to the substratum generally, possess _____ .

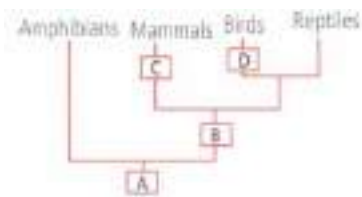
- a) radial symmetry b) one single opening of digestive canal
 c) asymmetrical body d) cilia on surface to create water current

21. Read the following statements and select the incorrect ones

- (i) Circulatory system in arthropods is of closed type.
 (ii) Parapodia in annelids help in swimming.
 (iii) Phylum Mollusca is the second largest animal phylum.
 (iv) Aschelminthes are dioecious.

- a) (i) and (iii) only b) (i) only c) (iii) only d) (iii) and (iv) only

22. Animal classification is depicted below. Mark the correct option.



A-Limbs

A-Egg with amnion membrane

B-Egg with amnion membrane

B-Limbs

C-Milk, hair

C-Milk, hair

a) D-Feathers

b) D-Feathers

A-Swim bladder

A-Milk, hair

B-Limbs

B-Limbs

C-Milk, hair

C-Egg with amnion membrane

c) D-Feathers

d) D-Feathers

23. Bilaterally symmetrical and acoelomate animals are exemplified by:

a) Platyhelminthes b) Aschelminthes c) Annelida d) Ctenophora

24. Which one of the following plants shows a very close relationship with a species of moth, where none of the two can complete its life cycle without the other?

a) Banana b) Yucca c) Hydrilla d) Viola

25. Fill up the blank spaces in the table below by selecting the correct option.

Phylum/Class	Excretory organ	Circulatory system	Respiratory organ
Arthropoda	A	B	Lungs/Gills/ Tracheal system
C	Nephridia	Closed	Skin
D	Metanephridia	Open	E

a)

A	B	C	D	E
Green gland	Closed	Mollusca	Annelida	Tracheal system

b)

A	B	C	D	E
Malpighian tubule	Open	Annelida	Mollusca	Featherlike gills

c)

A	B	C	D	E
Antennary gland	Open	Porifera	Amphibia	Lungs

d)

A	B	C	D	E
Nephridia	Closed	Mollusca	Annelida	Lungs

26. Which among these is not a homeotherm?

a) Aptenodytes b) Testudo c) Columba d) Neophron

27. Which of the following statements is/are correct or incorrect regarding Class Amphibia?

(i) Body is divisible into head and trunk. Tail is present in some amphibians.

(ii) Show respiration by gills, lungs and through skin.

(iii) Has scales in all its members.

(iv) Can lead dual life (aquatic and terrestrial).

(v) Has eyelids.

a) All are correct b) (i) and (iv) are correct. c) Only (iii) is incorrect.

d) Only (ii) is incorrect.

28. **Assertion:** Aschelminthes are called as pseudocoelomates.

Reason: In Aschelminthes, mesoderm is present as scattered pouches in between ectoderm and endoderm.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

29. Silk thread is obtained from silk moth during.

a) pupal stage b) larval stage c) nymph stage d) adult stage

30. Functionwise, just as there are nephridia in an earthworm, so are

_____ .
a) parotid glands in toad b) statocysts in prawn c) flame cells in liver fluke
d) myotomes in fish

31. Which of the following are correctly matched with respect to their taxonomic classification?

a) Flying fish, cuttlefish, silverfish - Pisces

b) Centipede, millipede, spider, scorpion - Insecta

c) House fly, butterfly, tsetse fly, silver fish - Insecta

d) Spiny anteater, sea urchin, sea cucumber - Echinoderma ta

32. Star fish belongs to _____ .

a) Asteroidea b) Ophiuroidea c) Holothuroidea d) Crinoidea

33. Most appropriate term to describe the life cycle of Obelia is _____ .

a) neoteny b) metagenesis c) metamorphosis d) All of these

34. **Assertion:** In birds, the skin is moist.

Reason: Moist skin of birds reduces effects of friction due to flying in air.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

35. In which one of the following, the genus name, its two characters and its class/phylum are correctly matched?

a)

Genus name	Two characters	Class/Phylum
Ascaris	(i) Body segmented (ii) Males and females distinct	Annelida

b)

Genus name	Two characters	Class/Phylum
Salamandra	(i) A tympanum cover middle ear, (ii) Fertilisation is internal	Amphibia

c)

Genus name	Two characters	Class/Phylum
Pteropus	(i) Skin possesses hair (ii) Oviparous	Mammalia

d)

Genus name	Two characters	Class/Phylum
Aurelia	(i) Cnidoblast (ii) Organ level of organisation	Coelenterata

36. Match column I with column II and select the correct option from the codes given below.

Column I (Scientific name)	Column II (Common name)
A. Testudo	(i) Tortoise
B. Galotes	(ii) Garden lizard
C. Hydrophis	(iii) Wall lizard
D. Hemidactylus	(iv) Sea snake

a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(i), B-(ii), C-(iv), D-(iii)

c) A-(ii), B-(i), C-(iii), D-(iv) d) A-(iv), B-(iii), C-(ii), D-(i)

37. Penguin occurs in _____.

a) Australia b) Antarctica c) Africa d) America

38. Birds and mammals share one of the following characteristics as a common feature.
a) Pigmented skin b) Pneumatic bones c) Viviparity d) Warm blooded
39. Typhlos is _____.
a) sea snake b) glass snake c) blind snake d) grass snake
40. A marine cartilaginous fish that can produce electric current is:
a) *Pristis* b) *Torpedo* c) *Trygon* d) *Scoliodon*
41. Which among these is the correct combination of aquatic mammals?
a) Seals, Dolphins, Sharks b) Dolphins, Seals, *Trygon*
c) Whales, Dolphins, Seals d) *Trygon*, Whales, Seals
42. Fish which can be used in biological control of mosquitoes/larvicidai fish is _____.
a) eel b) carp c) cat fish d) *Gambusia*
43. Which of the following pairs of animals has non-glandular skin?
a) Snake and Frog b) Chameleon and Turtle c) Frog and Pigeon
d) Crocodile and Tiger
44. Sound box of birds is called _____.
a) pygostyle b) larynx c) syrinx d) synsacrum
45. Radial symmetry is often exhibited by animals having _____.
a) one opening of alimentary canal b) aquatic mode of living
c) benthos/sedentary d) ciliary mode of feeding
46. What is common between earthworm and *Periplaneta*?
a) Both have red coloured blood. b) Both possess anal styles.
c) Both have Malpighian tubules d) Both have segmented body.
47. Which one of the following sets of animals belong to a single taxonomic group?
a) Cuttlefish, Jellyfish, Silverfish, Dogfish, Starfish b) Bat, Pigeon, Butterfly
c) Monkey, Chimpanzee, Man d) Silkworm, Tapeworm, Earthworm
48. Given below are four matchings of an animal and its kind of respiratory organ.

A.	Silver fish	-	Trachea
B.	Scorpion	-	Book lung
C.	Sea squirt	-	Pharyngeal gill slits
D.	Dolphin	-	Skin

The correct matchings are

- a) A and B b) A, B and C c) B and D d) C and D

49. In which one of the following, the genus name, its two characters and its phylum are not correctly matched?

a)

Genus name	Characters	Phylum
Pila	(i) Body segmented (ii) Mouth with radula	Mollusca

b)

Genus name	Characters	Phylum
Asterias	(i) Spiny skinned (ii) Water vascular system	Echinodermata

c)

Genus name	Characters	Phylum
Sycon	(i) Pore bearing (ii) Canal system	Porifera

d)

Genus name	Characters	Phylum
Periplaneta	(i) Jointed appendages (ii) Chitinous exoskeleton	Arthropoda

50. Which of the following is a correct match?

- a) Lamprey - Chondrichthyes b) Saw fish - Cyclostomata
c) Sea horse - Osteichthyes d) Hagfish - Osteichthyes

51. Which one of the following categories of animals, is correctly described with no single exception in it?

a)

All reptiles possess scales, have a three chambered heart and are cold blooded (poikilothermal).

b) All bony fishes have four pairs of gills and an operculum on each side.

c) All sponges are marine and have collared cells

d) All mammals are viviparous and possess diaphragm for breathing.

52. Which one of the following is a matching pair of an animal and a certain phenomenon it exhibits?

- a) Pheretima - Sexual dimorphism b) Musca - Complete metamorphosis
c) Chameleon - Mimicry d) Taenia - Polymorphism

53. Which one assists in locomotion?

- a) Trichocysts in Paramecium b) Pedicellariae of starfish
c) Clitellum in Pheretima d) Posterior sucker in Hirudinaria

54. Wish bone of birds is formed from _____ .

a) pelvic girdle b) skull c) hindlimbs d) pectoral girdle/clavicles

55. In some animal groups, the body is found divided into compartments with serial repetition of at least some organs. This characteristic feature is called
a) segmentation b) metamerism c) metagenesis d) metamorphosis.

56. Which of the following is commonly called "pearl oyster"?

a) Limulus b) Dentalium c) Pinctada d) Aurelia

57. Biradial symmetry and lack of cnidoblasts are the characteristics of

_____ .
a) Ctenoplane and Beroe b) Amelia and Paramecium c) Hydra and starfish
d) Starfish and sea anemone

58. Match the excretory organs listed under column I with the animals given under column II and select the correct option.

Column I (Excretory organs)	Column II (Animals)
A. Nephridia	(i) Hydra
B. Malpighian tubules	(ii) Leech
C. Protonephridia	(iii) Shark
D. Kidneys	(iv) Roundworms
	(v) Cockroach

a) A-(ii), B-(v), C-(iv), D-(iii) b) A-(iv), B-(ii), C-(i), D-(v)
c) A-(v), B-(ii), C-(iv), D-(iii) d) A-(ii), B-(iv), C-(v), D-(i)

59. Match the following and select the correct option from the codes given below.

Column I	Column II
A. Physalia	(i) Sea anemone
B. Meandrina	(ii) Brain coral
C. Gorgonia	(iii) Sea fan
D. Adamsia	(iv) Portuguese man-of-war

a) A-(iii), B-(ii), C-(i), D-(iv) b) A-(iv), B-(iii), C-(ii), D-(i)
c) A-(iv), B-(ii), C-(iii), D-(i) d) A-(ii), B-(iii), C-(i), D-(iv)

60. Which of the following is/are not the characteristics of the Class Osteichthyes?

(i) Body is streamlined and mouth is terminal.
(ii) Gills are covered by operculum.
(iii) Skin covered with cycloid and placoid scales.
(iv) Many of them are viviparous
a) (iv) only b) (iii) and (iv) c) (i), (iii) and (iv) d) (i) and (ii)

61. What is common between parrot, platypus and Kangaroo

a) Ovoparity b) Homeothermy c) Toothless jaws
d) Functional post-anal tail

62. Which of the following have porous body and are diploblastic?
 a) Aurelia and Obelia b) Adamsia and Euplectella
 c) Leucosolenia and Spongilla d) Sycon and Hydra
63. In Arthropoda, head and thorax are often fused to form cephalothorax, but in which one of the following classes, is the body divided into head, thorax and abdomen?
 a) Insecta b) Myriapoda c) Crustacea d) Arachnida and Crustacea
64. Both male and female pigeons secrete milk, through _____.
 a) salivary glands b) modified sweat glands c) crop d) gizzard
65. Examine the figures given below and identify the option which represents correct grouping of the labelled figures A, B, C and D.



a)

A	B	C	D
Balanoglossus	Pristis	Ornithorhynchus	Pila

b)

A	B	C	D
Pila	Balanoglossus	Pristis	Balanoglossus

c)

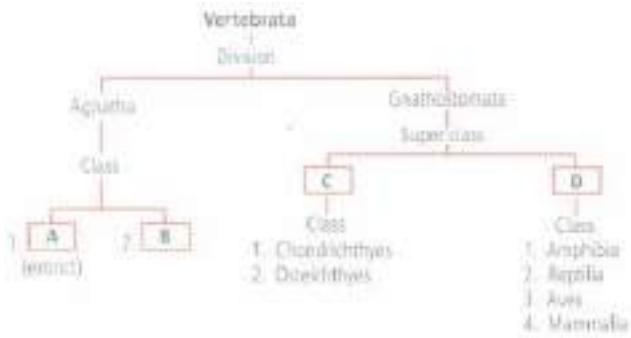
A	B	C	D
Pila	Ornithorhynchus	Pristis	Balanoglossus

d)

A	B	C	D
Balanoglossus	Pila	Ornithorhynchus	Pristis

66. Budding is a normal mode of asexual reproduction in _____.
 a) starfish and Hydra b) Hydra and sponges c) tapeworm and Hydra
 d) sponge and starfish
67. The body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum:
 a) Coelenterata b) Porifera c) Mollusca d) Protozoa

68. Go through the following flow chart for division of subphylum vertebrata. Fill the gaps A, B, C and D and select the correct option.



a)

A	B	C	D
Ostracoderm	Cyclostomata	Pisces	Tetrapoda

b)

A	B	C	D
Cyclostomata	Ostracodermi	Pisces	Tetrapoda

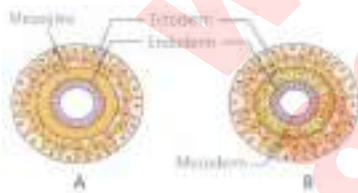
c)

A	B	C	D
Ostracoderm	Tetrapoda	Cyclostomata	Pisces

d)

A	B	C	D
Pisces	Ostracodermi	Tetrapoda	Cyclostomata

69. The animals possessing the following type of germ layers (A and B) are called _____ and _____ respectively.



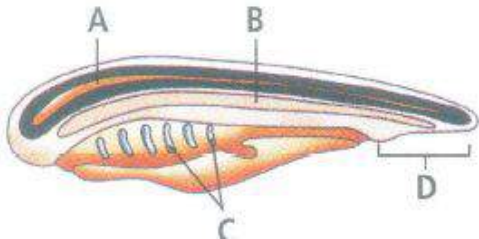
- a) diploblastic, triploblastic b) triploblastic, diploblastic
 c) diploblastic, diploblastic d) triploblastic, triploblastic
70. What is true about Nereis, scorpion, cockroach and silver fish?
 a) They all possess dorsal heart. b) None of them is aquatic.
 c) They all belong to the same phylum.
 d) They all have jointed paired appendages.
71. Identify the following animals and the classes to which they belong.



- a) A-Salamandra, Amphibia; B-Ghelone, Reptilia; C-Chameleon, Reptilia
 b) A-Salamandra, Reptilia; B-Ghelone, Reptilia; C-Chameleon, Reptilia

- c) A-Salamandra, Amphibia; B-Ghelone, Amphibia; C-Chameleon, Amphibia
d)
A-Salamandra, Urochordata; B-Ghelone, Cephalochordata; C-Chameleon, Hemichordata

72. Animals belonging to Phylum Chordata are fundamentally characterised by the presence of structures noted as A, B, C and D. Identify them and select the correct option.



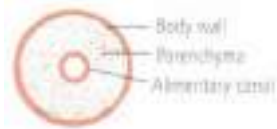
- a) A-Notochord, B-Nerve cord, C-Gill slits, D-Post-anal part
b) A-Nerve cord, B-Notochord, C-Gill slits, D-Post-anal part
c) A-Nerve cord, B-Notochord, C-Post-anal part, D-Gill slits
d) A-Nerve cord, B-Gill slits, C-Notochord, D-Post-anal part
73. Which of the following features is used to identify a male cockroach from a female cockroach?
- a) Forewings with darker tegmina. b) Presence of caudal styles.
c) Presence of a boat-shaped sternum on the 9th abdominal segment.
d) Presence of anal cerci.
74. Identify the figures A, B, C and D and select the correct option.



- a) A-Liver fluke; B-Male roundworm; C-Hirudinaria; D-Nereis
b) A-Liver fluke; B-Female roundworm; C-Hirudinaria; D-Nereis
c) A-Liver fluke; B-Male roundworm; C- Nereis; D- Hirudinaria
d) A-Liver fluke; B-Female roundworm; C-Nereis; D-Hirudinaria
75. Which one of the following characteristics is not shared by birds and mammals?
- a) Breathing using lungs b) Viviparity c) Warmblooded nature
d) Ossified endoskeleton
76. An important characteristics that Hemichordates share with chordates is:
- a) Absence of notochord b) Ventral tubular nerve cord
c) Pharynx with gill slits d) Pharynx without gill slits.
77. Necturus is _____ .

a) hell bender b) congo eel c) mud puppy d) blind worm

78. The given figure shows a cross section of the body of an invertebrate. Identify the animal which has such body plan.



a) Cockroach (Arthropoda) b) Roundworm (Aschelminthes)
c) Planaria (Platyhelminthes) d) Earthworm (Annelida)

79. Which one of the following pairs of animals are similar to each other for the feature stated against them?

a) Pteropus and Ornithorhyncus - viviparity
b) Garden lizard and crocodile - three chambered heart
c) Ascaris and Ancylostoma - metameric segmentation
d) Seahorse and flying fish - cold blooded (poikilothermal)

80. Metameric segmentation is the characteristic of _____.

a) Echinodermata and Annelida b) Annelida and Arthropoda
c) Mollusca and Chordata d) Platyhelminthes and Arthropoda

81. Annual migration does not occur in the case of _____.

a) Siberian crane b) Salamander c) Arctic tern d) Salmon

82. Amphibians share with reptiles all of the following characters except

a) ventral heart b) external fertilisation and indirect development
c) dioecious, oviparous d) cold blooded or poikilotherms.

83. Besides Annelida and Arthropoda, the metamerism is exhibited by _____.

a) Cestoda b) Chordata c) Mollusca d) Acanthocephala

84. Which of the following characters does not fit for Aves?

a) Skin is dry, without glands except oil/preen glands at the base of tail.
b) Alimentary canal has 2 additional chambers, crop and gizzard.
c)

Hind limbs are modified for walking, swimming or clasping. Forelimbs are modified into wings.

d) Beak has teeth.

85. Select the correct matching of animals, their symmetry, organisation and coelom type.

a)

Animals	Symmetry	Organisation	Coelomtype
Ctenophores	Radial	Diploblastic	Pseudo coelomates

b)

Animals	Symmetry	Organisation	Coelomtype
Echinoderms	Bilateral	Triploblastic	Coelomates

c)

Animals	Symmetry	Organisation	Coelomtype
Platyhelminthes	Bilateral	Triploblastic	Acoelomates

d)

Animals	Symmetry	Organisation	Coelomtype
Annelids	Biradial	Diploblastic	Coelomates

86. Which of the following are correct?

(i) Diploblastic	Poriferans, Coelenterates
(ii) Triploblastic	Platyhelminthes to Chordates
(iii) Acoelomata	Poriferans, Coelenterates, Platyhelminthes
(iv) Pseudocoelomata	Aschelminthes/Roundworms
(v) Eucoelomata	Annelids to Chordates

- a) (ii), (iii), (iv) and (v) b) (iii) and (v) c) (i), (ii) and (v)
 d) (i), (ii), (iii), (iv) and (v)

87. Bladderworm/cysticercus is the larval stage of _____ .

- a) tapeworm b) roundworm c) pinworm d) liver fluke

88. **Assertion:** The body of hemichordates is divisible into proboscis, collar and trunk.**Reason:** Proboscis gland helps in digestion.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

89. Match Column I with Column II for housefly classification and select the correct option using the codes given below:

Column I	Column II
A. Family	(i) Diptera

B. Order	(ii) Arthropoda
C. Class	(iii) Muscidae
D. Phylum	(iv) Insecta

a)	b)	c)	d)
A B C D	A B C D	A B C D	A B C D
(iii)(i)(iv)(ii)	(iii)(ii)(iv)(i)	(iv)(iii)(ii)(i)	(iv)(ii)(i)(iii)

90. Give the correct matching of causative agent/germ and disease.
- a) Anopheles - malaria b) Leishmania - sleeping sickness
c) Glossina - kala-azar d) Wuchereria - filariasis
91. Special character of coelenterates is _____.
a) polymorphism b) nematocysts c) flame cells d) hermaphroditism
92. Phylum Mollusca can be distinguished from other invertebrates by the presence of
a) bilateral symmetry and exoskeleton b) a mantle and gills
c) shell and non-segmented body d) a mantle and non-segmented body.
93. You have discovered an animal having characters like, triploblastic, bilateral symmetry, coelomate, chitinous exoskeleton, head, thorax and abdomen as body parts, and jointed appendages.
You should place the animal under
a) mollusca b) arthropoda c) annelida d) echinodermata.
94. **Assertion:** Sponges exhibit cellular level of organisation.
Reason: In sponges, cells are arranged as loose cell aggregates.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false.
95. Identify the following animals and select the correct option.



a)

A	B	C
Corvus	Columba	Psittacula

b)

A	B	C
Neophron	Struthio	Psittacula

c)

A	B	C
Struthio	Pavo	Aptendodytes

d)

A	B	C
Neophron	Corvus	Columba

96. In some chordates, the notochord is modified as the vertebral column. Such animals are called vertebrates. Which one of the following statements makes sense?
- All chordates are vertebrates but all vertebrates are not chordates
 - All vertebrates are chordates and all chordates are vertebrates
 - All vertebrates are chordates but all chordates are not vertebrates
 - Chordates are not vertebrates and vertebrates are not chordates.
97. Ascaris is characterised by
- Presence of true coelom and metamerism
 - Absence of true coelom but presence of metamerism
 - Presence of neither true coelom nor metamerism
 - Presence of true coelom but absence of metamerism
98. Tube feet occur in _____.
- cockroach
 - starfish
 - cuttle fish
 - cat fish
99. Which one of the following features is common in silver fish, scorpion, dragonfly and prawn?
- Three pairs of legs and segmented body
 - Chitinous cuticle and two pairs of antennae
 - Jointed appendages and chitinous exoskeleton
 - Cephalothorax and tracheae
100. Which of the following characteristics is mainly responsible for diversification of insects on land?
- Bilateral symmetry
 - Exoskeleton
 - Eyes
 - Segmentation
101. Which of the following animals does not undergo metamorphosis?
- Moth
 - Tunicate
 - Earthworm
 - Starfish
102. Skin is a respiratory organ in _____.
- lizards
 - birds
 - primitive mammals
 - frog
103. **Assertion:** Mammalian teeth are heterodont.
Reason: Mammalian teeth are embedded in a socket of jaw.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

104. Adult Culex and Anopheles can be distinguished with the help of

_____.

- a) mouth parts/colour b) sitting posture c) antennae/wings
d) feeding habits

105. The excretory structures of flat worms/Taenia are _____.

- a) flame cells b) protonephridia c) Malpighian tubules d) green glands

106. The simplest type of canal system in Porifera is _____.

- a) ascon type b) leucon type c) sycon type d) radial type

107. Coelom derived from blastocoel is known as _____.

- a) enterocoelom b) schizocoelom c) pseudocoelom d) haemocoelom

108. Organ pipe coral is _____.

- a) Tubipora b) Astraea c) Helipora d) Fungia

109. Lamina propria is connected with _____.

- a) acini b) liver c) Graafian follicle d) intestine

110. Which of the following is not found in birds?

- a) Hind limb b) Pectoral girdle c) Pelvic girdle d) Fore limb

111. A chordate character is _____.

- a) gills b) spiracles c) post-anal tail d) chitinous exoskeleton

112. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Amphibia	(i) Air bladder
B. Mammals	(ii) Cartilaginous notochord
C. Chondrichthyes	(iii) Mammary glands
D. Osteichthyes	(iv) Pneumatic bones
E. Cyclostomata	(v) Dual habitat
F. Aves	(vi) Sucking and circular mouth without jaws

- a) A-(i), B-(iii), C-(iv), D-(v), E-(ii), F-(vi) b) A-(ii), B-(v), C-(iv), D-(vi), E-(iii), (i)
c) A-(v), B-(iii), C-(ii), D-(i), E-(vi), F-(iv)

d) A-(vi), B-(ii), C-(iii), D-(i), E-(iv), F-(v)

113. Which of the following conclusions can be drawn from this data?

- (i) Ecdysone hormone is produced irrespective of the level of feeding.
 - (ii) CC is the site of production of juvenile hormone.
 - (iii) PTTH is produced irrespective of the level of feeding.
 - (iv) Increase in juvenile hormone is an important trigger for production of PTTH.
 - (v) Absence of CC alone is a trigger for molting into adult form.
 - (vi) Well-fed larvae in absence of juvenile hormone can molt into adults.
- a) (i), (iii), (iv) and (v) b) (ii), (iv) and (v) c) (ii) and (vi) d) (i) and (iv)

114. Which one of the following option gives the correct categorization of six animals according to the type of nitrogenous wastes (A, B, C) they give out?

a)

Options	A	B	C
	Ammonotelic	Ureotelic	Uricotelic
(a)	Pigeon, humans	Aquaticamphibia, lizards	Cockroach, frog

b)

Options	A	B	C
	Ammonotelic	Ureotelic	Uricotelic
(b)	Frog lizards	Aquaticamphibia, humans	Cockroach, pigeon

c)

Options	A	B	C
	Ammonotelic	Ureotelic	Uricotelic
(c)	Aquaticamphibia	Frog, humans	Pigeon, lizards, cockroach

d)

Options	A	B	C
	Ammonotelic	Ureotelic	Uricotelic
(d)	Aquaticamphibia	Cockroach, humans	Frog, pigeon, lizards

115. To which classes do the following animals belong?

A-Petromyzon, B-Scoliodon, C-Pristis

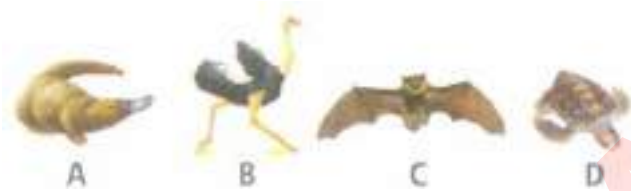
- a) A-Cyclostomata, B-Chondrichthyes, C-Chondrichthyes
- b) A-Osteichthyes, B-Chondrichthyes, C-Chondrichthye
- c) A-Osteichthyes, B-Chondrichthyes, C-Osteichthyes
- d) A-Osteichthyes, B-Chondrichthyes, C-Cyclostomata

116. Body having meshwork of cell, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum.

- a) Porifera b) Mollusca c) Protozoa d) Coelenterate

117. Which one of the following pairs is wrongly matched?

- a) XO type sex determination - Grasshopper
 - b) ABO blood grouping - Codominance
 - c) Starch synthesis in pea - Multiple alleles d) TH Morgan - Linkage
118. Which one of the following groups of animals is bilaterally symmetrical and triploblastic?
- a) Aschelminthes (Round worm) b) Ctenophores c) Sponges
 - d) Coelenterates (Cnidarians)
119. Which one of the following pairs of animals comprises jawless fishes?
- a) Mackerals and Rohu b) Lampreys and hagfishes
 - c) Guppies and hagfishes d) Lampreys and eels.
120. Refer to the given figures A-D and select the incorrect statement regarding them.



- a) A is a homoiotherm in which pinnae are absent
 - b) B is a poikilotherm in which preen glands are present at the base of tail.
 - c) C is a mammal having 12 pairs of cranial nerves.
 - d) D is cold blooded having a monocondylic skull.
121. What is correct about Taenia?
- a) Mature proglottids contain both male and female organs
 - b) Male organs occur in posterior proglottids
 - c) Male organs occur in anterior proglottids
 - d) Female organs occur in anterior proglottids
122. Eye of the molluscan group that resembles vertebrate eye is _____ .
- a) Bivalvia b) Gastropoda c) Pelecypoda d) Pelecypoda
123. Feet of kingfisher are modified for _____ .
- a) wading b) perching c) running d) catching
124. Which one of the following has the highest number of species in nature?
- a) Fungi b) Insects c) Birds d) Angiosperms
125. Ascaris larva is called _____ .
- a) cysticercus b) rhabditiform c) hexacanth d) onchosphere
126. Select the correct option that represents examples of the following types of animals.
- (i) Roundworm

(ii) Fish possessing poison sting

(iii) A limbless amphibian

(iv) An oviparous mammal

a)

(i)	(ii)	(iii)	(iv)
Palaemon	Labeo rohita	Salamander	Kangaroo

b)

(i)	(ii)	(iii)	(iv)
Nereis	Torpedo	Hyla	Pteropus

c)

(i)	(ii)	(iii)	(iv)
Hirudinaria	Pristis	Bufo	Delphinus

d)

(i)	(ii)	(iii)	(iv)
Ascaris lumbricoides	Sting ray	Ichthyophis	Duck-billed platypus

127. Crocodile and penguin are similar to whale and dog fish in which one of the following features?

a) Possess a solid singlestrandedcentralnervoussystem

b) Lay eggs and guard them till they hatch c) Possess bony skeleton

d) Have gill slits at some stage

128. In hot summer and cold winter, the number of malaria cases as well as Anopheles declines, reappearance of malaria in humid warm conditions is due to

a) surviving malarial parasites in human carriers

b) surviving sporozoites in surviving mosquitoes c) monkeys

d) mosquito larvae in permanent waters

129. **Assertion:** Amphibian males and females produce lot of gametes.

Reason: Males lack copulatory organ in amphibians.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

130. In which one of the following, the genus name, its two characters and its phylum are not correctly matched, whereas the remaining three are correct?

a)

Genus	Two characters	Phylum
Sycon	(a) Pore bearing (b) Canal system	Porifera

b)

Genus	Two characters	Phylum
Periplaneta	(a) Jointed ap-pendages (b) Chitinous exoskeleton	Arthropoda

c)

Genus	Two characters	Phylum
Pila	(a) Body seg-mented (b) Mouth with Radula	Mollusca

d)

Genus	Two characters	Phylum
Asterias	(a) Spiny skinned (b) Water vascular system	Echinodermata

131. Which one of the following statements about all the four of Spongilla, leech, dolphin and penguin is correct?

a)

Spongilla has special collared cells called choanocytes, not found in the remaining three.

b) All are bilaterally symmetrical.

c) Penguin is homoiothermic while the remaining three are poikilothermic.

d) Leech is a freshwater form while all others are marine

132. Select the correct option

a)

11th and 12th pairs of ribs are connected to the sternum with the help of hyaline cartilage.

b)

Each rib is a flat thin bone and all the ribs are connected dorsally to the thoracic vertebrae and ventrally to the sternum

c)

There are seven pairs of vertebrosteral, three pairs of vertebrochondral and two pairs of vertebral ribs.

d) 8th, 9th and 10th pairs of ribs articulate directly with the sternum.

133. The characters given below are shown by
- (i) Extracellular and intracellular digestion
 - (ii) Exclusively marine, radially symmetrical, diploblastic, tissue level of organisation
 - (iii) Bisexual, fertilisation external and indirect development
 - (iv) No asexual reproduction
 - (v) Presence of comb plates
- a) Cnidariac b) Porifera c) Ctenophora d) none of these.
134. The echinoderms, hemichordates and chordates had which of the following larva as a common ancestral form?
- a) Tornaria b) Trochophore c) Dipleurula d) Bipinnaria
135. Which of the following statements is incorrect with regard to bilateral symmetry?
- a) Body can be divided into two equal halves by a single plane only.
- b)
- The organisms that show bilateral symmetry have paired body organs that occur on the two sides of a central axis.
- c) It is found in all invertebrates and few vertebrates.
- d) Spider and crab show bilateral symmetry
136. Which one of the following is an exotic Indian fish?
- a) Catla catla b) Heteropneustes fossilis c) Cyprinus caprio d) Labeo rohita
137. Which one of the following characters is not typical of the class Mammalia?
- a) Thecodont dentition b) Alveolar lungs c) Ten pairs of cranial nerves
- d) Seven cervical vertebrae
138. Which of the following groups of animals are uricotelic?
- a) Reptiles, birds, land snails, insects b) Reptiles, birds, land snails
- c) Aquatic amphibians, birds, land snails, insects
- d) Amphibians, reptiles, birds, insects
139. Mucus helps frog in forming.
- a) thick skin b) dry skin c) smooth skin d) moist skin
140. Which one of the following groups of animals is correctly matched with its characteristic feature without any exception?
- a) Reptilia: possess 3-chambered heart with an incompletely divided ventricle.
- b) Chordata: possess a mouth with an upper and a lower jaw
- c) Chondrichthyes: possess cartilaginous endoskeleton.
- d) Mammalia: give birth to young ones.
141. An egg laying mammal is _____.
- a) kangaroo b) platypus c) koala d) whale

142. True coelom is the space lying between the alimentary canal and body wall enclosed by the layers of _____ .
 a) ectoderm on both sides
 b) endoderm on one side and ectoderm on the other
 c) mesoderm on one side and ectoderm on the other
 d) mesoderm on both sides
143. Given below are three statements regarding Aschelminthes.
 (i) They are bilaterally symmetrical and triploblastic.
 (ii) They are dioecious.
 (iii) All are plant or animal parasites.
 Select the option that has both the correct statements.
 a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) None of these
144. In contrast to annelids the platyhelminthes show:
 a) Radial symmetry b) Presence of pseudocoel c) Bilateral symmetry
 d) Absence of body cavity.
145. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Protandry	(i) Ovaries mature earlier than testes
B. Protogyny	(ii) Testes mature earlier than ovaries
C. Metameric segmentation	(iii) Scorpion
D. Radial symmetry	(iv) Nereis
E. Book lungs	(v) Aurelia

- a) A-(ii), B-(i), C-(v), D-(iv), E-(iii) b) A-(i), B-(ii), C-(iii), D-(v), E-(iv)
 c) A-(i), B-(ii), C-(iv), D-(iii), E-(v) d) A-(ii), B-(i), C-(iv), D-(v), E-(iii)
146. Which of the following statements are true for the phylum - chordata?
 (a) In urochordata notochord extends from head to tail and it is present throughout their life.
 (b) In Vertebrata notochord is present during the embryonic period only.
 (c) Central nervous system is dorsal and hollow.
 (d) Chordata is divided into 3 subphyla: Hemichordata, Tunicata and Cephalochordata.
 a) (a) and (b) b) (b) and (c) c) (d) and (c) d) (c) and (a)
147. Which is not correct for sponges?
 a) Internal fertilisation b) External fertilisation c) Gemmule formation
 d) Gametes are formed from epidermal cells
148. A larval stage occurs in the life history of all members of the group _____ .

- a) frog, lizard and cockroach b) Ascaris, housefly and frog
c) housefly, earthworm and mosquito d) butterfly, frog and mosquito
149. In which of the following animal post anal tail is found?
a) Earthworm b) Lower invertebrate c) Scorpion d) Cobra
150. Which one of the following statements is incorrect?
a) Mesoglea is present in between ectoderm and endoderm in Obelia.
b) Asterias exhibits radial symmetry c) Fasciola is a pseudocoelomate animal.
d) Taenia is a triploblastic animal
151. Which one of the following is a matching pair of a body feature and the animal possessing it?
a) Ventral central nervous system - Leech
b) Pharyngeal gill slits absent in embryo - Chameleon
c) Ventral heart - Scorpion d) Post-anal tail - Octopus
152. What is common in whale, bat and rat?
a) Absence of neck b) Muscular diaphragm between thorax and abdomen
c) Extra-abdominal testes to avoid high temperature of body
d) Presence of external ears
153. Which of the following characteristic features always holds true for the corresponding group of animals?
a) 3-chambered heart with one completely divided ventricle: Reptilia
b) Cartilaginous endoskeleton: Chondrichthyes c) Viviparous: Mammalia
d) Possess a mouth with an upper and lower jaw: Chordata
154. **Assertion:** Platyhelminthes are generally hermaphrodites.
Reason: In Platyhelminthes, fertilisation is internal.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
155. Metamorphosis of insects is regulated through hormone _____.
a) pheromone b) thyroxine c) ecdysone d) All of these
156. A common characteristic of all vertebrates is _____.
a) presence of skull b) division of body into head, neck, trunk and tail
c) presence of two pairs of functional appendages

- d) body is covered with an exoskeleton
157. Which one of the following kinds of animals are triploblastic?
a) Corals b) Flatworms c) Sponges d) Ctenophores
158. **Assertion:** Digested and semi-digested food is absorbed by body surface in tapeworms.
Reason: Digestive organs are absent in tapeworms.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
159. Metagenesis refers to :
a) Presence of a segmented body and parthenogenetic mode of reproduction
b) Presence of different morphic forms
c)
Alternation of generation between asexual and sexual phases of an organism
d) Occurrence of a drastic change in form during post-embryonic development.
160. Consider the following statements (A-C) each with two blanks.
A. Animals like **Hydra** and jellyfish depict (i)_symmetry whereas earthworm and leech show (ii)_symmetry.
B. In_(iii) and (iv), digestive tract has only single opening (mouth) and is said to be incomplete.
C. *Trichinella* (*Trichina* worm) is a cosmopolitan (v), parasite whereas **Fasciola** (liver fluke) lives in the bile ducts of the liver of_(vi).
Which one of the following options, correctly fills any two statements?
(i)-bilateral, (ii)-radial (iii)-Porifera, (iv)-Pisces
a) (v)-snail, (vi)-human b) (v)-human, (vi)-sheep
(i)-radial, (ii)-bilateral (iii)-Amphibia, (iv)-Annelida
c) (iii)-Coelenterata, (iv)-Platyhelminthes d) (v)-mosquito, (vi)-human
161. Which one of the following sets of animals share a four chambered heart?
a) Amphibian, Reptiles, Birds b) Crocodiles, Birds, Mammals
c) Crocodiles, Lizards, Turtles d) Lizards, Mammals, Birds

162. Read the given statements and select the correct option.

Statement 1: Urochordates and cephalochordates are often called invertebrate chordates.

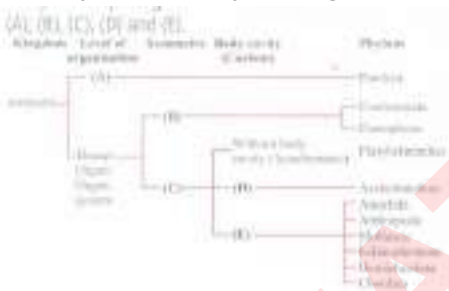
Statement 2: They are a connecting link between the invertebrates and the chordates.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct
- d) Both statements 1 and 2 are incorrect

163. Which of the following animals is correctly matched with its particular named taxonomic category?

- a) Housefly -Musca, an order b) Tiger - tigris, the species
- c) Cuttlefish -Mollusca, a class d) Humans - Primata, the family

164. Study carefully the given flow chart and fill in the blanks (A), (B), (C), (D) and (E).



a)

A	B	C	D	E
Cellular level	Bilateral symmetry	Radial symmetry	Pseudo-coelomates	Coelomates

b)

A	B	C	D	E
Cellular level	Radial symmetry	Bilateral symmetry	Coelomates	Pseudo-coelomates

c)

A	B	C	D	E
Cellular level	Bilateral symmetry	Radial symmetry	Coelomates	Pseudo-coelomates

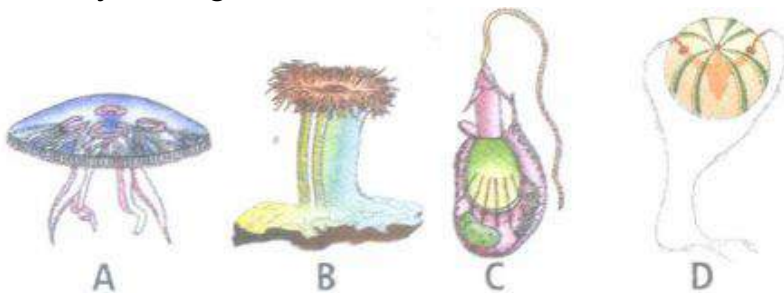
d)

A	B	C	D	E
Cellular level	Radial symmetry	Bilateral symmetry	Pseudo-coelomates	Coelomates

165. Kala-azar and oriental sore are spread by _____ .

- a) housefly b) bed bug c) sand fly d) fruit fly

166. Which group of animals belong to the same phylum?
a) Earthworm, Pinworm, Tapeworm b) Prawn, Scorpion, Locusta
c) Sponga, Sea anemone, Starfish d) Malarial parasite, Amoeba, Mosquito
167. Male and female cockroaches can be distinguished externally through _____ .
a) anal styles in male b) anal cerci in female
c) anal style and antennae in females d) Both (b) and (c)
168. Closed circulatory system occurs in _____ .
a) snail b) cockroach c) cuttle fish d) All of these
169. Bird vertebrae are _____ .
a) acoelous b) heterocoelous c) amphicoelous d) procoelous
170. Read the given statements and select the correct option.
Statement 1: All triploblastic animals are eucoelomates.
Statement 2: They have a false coelom.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
171. Assertion (A) *Periplaneta americana* is nocturnal, omnivorous, household pest.
Reason (R) It is because it acts as scavenger.
a) A is true, but R is false b) A is false, but R is true
c) Both A and R are true and R is correct explanation of A
d) Both A and R are true, but R is not correct explanation of A
172. Photoreceptors of earthworm occur on _____ .
a) Clitellum b) many eyes c) Dorsal surface d) lateral sides
173. Which one occurs in Echinodermata?
a) Bilateral symmetry b) Radial symmetry c) Porous body d) Soft skin
174. Identify the figures A, B, C and D and select the correct option.



a)

A	B	C	D
Pleurobrachia	Cnidoblast	Aurelia	Adamsia

b)

A	B	C	D
Aurelia	Adamsia	Cnidoblast	Pleurobrachia

c)

A	B	C	D
Cnidoblast	Pleurobrachia	Adamsia	Aurelia

d)

A	B	C	D
Adamsia	Aurelia	Pleurobrachia	Cnidoblast

175. Match column I with column II and select the correct option from the given codes.

- a) They all possess dorsal heart b) None of them is aquatic
c) None of them is aquatic d) They all have jointed paired appendages

176. Which of the following pairs are correctly matched?

Animals	Morphological features
Crocodile	4-chambered heart
Sea urchin	Parapodia
Obelia	Metagenesis
Lemur	Thecodont

- a) (ii), (iii) and (iv) b) (i) and (iv) c) (i) and (ii) d) (i), (iii) and (iv)

177. Which one of the following statements about certain given animals is correct?

- a) Roundworms are pseudocoelomates b) Molluscs are acoelomates
c) Annelids are pseudocoelomates d) Flatworms are coelomates

178. Which of the following is incorrectly matched?

- a) Spiny tailed lizard - *Uromastix hardwickii*
b) Garden lizard - *Hemidactylus flaviviridis* c) Gila monster - *Heloderma*
d) Monitor lizard *Varanus*

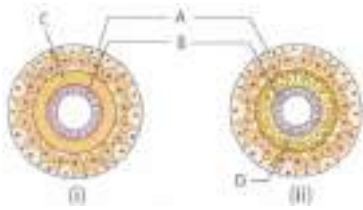
179. What will you look for to identify the sex of the following?

- a) Female *Ascaris*- Sharply curved posterior end.
b) Male frog- A copulatory pad on the first digit of the hind limb.
c) Female cockroach-Anal cerci. d) Male shark-Claspers borne on pelvic fins.

180. Examine the figures of diploblastic

(i) and triploblastic

(ii) organisation in animals given below and identify the labelled parts A to D.



a)

A	B	C	D
Mesoglea	Ectoderm	Endoderm	Mesoderm

b)

A	B	C	D
Endoderm	Mesoderm	Mesoglea	Ectoderm

c)

A	B	C	D
Mesoderm	Mesoglea	Ectoderm	Endoderm

d)

A	B	C	D
Ectoderm	Endoderm	Mesoglea	Mesoderm

181. Which one of the following statements is totally wrong about the occurrence of notochord while the other three are correct?

- a) It is absent throughout life in humans from the very beginning
- b) It is present throughout life in Amphioxus
- c) It is present only in larval tail in Ascidians
- d) It is replaced by a vertebral column in adult frog

182. Stinging capsules (nematocysts) are found in

- a) Scypha and brain coral b) Cliona and Chalina c) sea pen and sea fan
- d) Grantia and Velella.

183. In which of the following, haemocyanin pigment is found?

- a) Mollusca b) Annelida c) Echinodermata d) Lower chordata

184. Aristotle's lantern occurs in class

- a) Echinoidea b) Asteroidea c) Holothuroidea d) Ophiuroidea

185. Flight muscles of bird are attached to _____.

- a) clavicle b) keel of sternum c) scapula. d) coracoid

186. Which one of the following animals does not undergo metamorphosis?

- a) Moth b) Tunicate c) Earthworm d) Starfish

187. Jelly fish belongs to class _____.

a) Hydrozoa b) Scyphozoa c) Anthozoa d) None of these

188. Bilateral symmetry, segmentation, coelom and open circulatory system characterises which of the following phyla?

a) Annelida b) Mollusca c) Arthropoda d) Echinodermata

189. Identify the given animal



a) Naja b) Ornithorhynchus c) Struthio d) Chameleon

190. If an unfed, completely decapitated, fifth (final) instar juvenile is connected to a well-fed, decapitated fourth instar juvenile by a glass tube so that fluids can be exchanged, what will be the expected result?

a) Both bugs will continue to remain juveniles.

b) Both bugs will molt into adult forms

c)

The bug in the fourth instar will remain as a juvenile while the one in the fifth instar will molt into an adult.

d)

The bug in the fourth instar will molt into an adult and the one in the fifth instar will remain as a juvenile.

191. The canal system is a characteristic feature of _____ .

a) echinoderms b) helminthes c) coelenterates d) sponges

192. Pancreatic juice and hormones of pancreas are produced by _____ .

a) same cells b) same cells at different times c) statement is wrong

d) different cells

193. The flightless bird cassowary is found in _____ .

a) Mauritius b) Australia c) New Zealand d) Indonesia

194. One of the representatives of phylum Arthropoda is :

a) Cuttlefish b) Silverfish c) Pufferfish d) Flying fish

195. **Assertion:** Digestion is chiefly extracellular in Ctenophores.

Reason: In Ctenophores, digestive tract is incomplete.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

196. From the following statements select the wrong one.

a) Prawn has two pairs of antennae.

b) Nematocysts are characteristics of the Phylum Cnidaria.

c) Millepedes have two pairs of appendages in each segment of the body.

d) Animals belonging to Phylum Porifera are exclusively marine.

197. Frogs differ from humans in possessing:

a) paired cerebral hemispheres b) hepatic portal system

c) nucleated red blood cells d) thyroid as well as parathyroid

198. Which one of the following is not a characteristic of phylum Annelida ?

a) Ventral nerve cord b) Closed circulatory system c) Segmentation

d) Pseudocoelome

199. Read the given statements and select the correct option.

Statement 1: Amphibians often hibernate in winter and aestivate in summer.

Statement 2: They are poikilothermic animals and cannot regulate body temperature.

a) Both statements 1 and 2 are correct,

b) Statement 1 correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect.

200. Which of the following are examples of Arthropoda?

a) Silver fish, star fish, prawn b) Clam worm, apple snail, honey bee

c) Clam worm, apple snail, honey bee d) Cockroach, scorpion, prawn

201. Match the following columns and select the correct option.

Column-I	Column-II
(a) 6-15 pairs of gill slits	(i) Trygon
(b) Heterocercal caudal fin	(ii) Cyclostomes
(c) Air bladder	(iii) Chondrichthyes
(d) Poison sting	(iv) Osteichthyes

Select the correct option.

- a) (a)(b)(c)(d) b) (a)(b)(c)(d) c) (a)(b)(c)(d) d) (a)(b)(c)(d)
 (a)(iv)(ii)(iii)(i) (b)(i)(iv)(iii)(ii) (c)(ii)(iii)(iv)(i) (d)(iii)(iv)(i)(ii)

202. Which of the following statements is correct for sponges without exception?

- a) They all have calcareous spicules. b) They have high regenerative power
 c) They are found only in marine water. d) They are all radially symmetrical

203. Which one of the following groups of three animals is correctly matched with their one characteristic morphological feature?

a)

Animals	Morphological features
Scorpion, spider, cockroach	Ventral solid central nervous system

b)

Animals	Morphological features
Cockroach, locust, Taenia	Metameric segmentation

c)

Animals	Morphological features
Liver fluke, sea anemone, sea cucumber	Bilateral symmetry

d)

Animals	Morphological features
Centipede, prawn sea urchin	Jointed appendages

204. Earthworms are _____.

- a) useful b) harmful c) more useful than harmful d) more harmful

205. Which one of the following groups of animals is correctly matched with its one characteristic feature without even a single exception?

a)

Reptilia: possess 3 - chambered heart with one incompletely divided ventricle

b) Chordata: possess a mouth provided with an upper and lower jaw

c) Chondrichthyes: possess cartilaginous endoskeleton

d) Mammalia: give birth to young one.

206. Body cavity is the cavity present between body wall and gut wall. In some animals the body cavity is not lined by mesoderm. Such animals are called
 a) acoelomate b) pseudocoelomate c) coelomate d) haemocoelomate.

207. Bull frog of India is _____.

- a) Rana tigrina b) R. sylvatica c) R. ecutesbeiana d) R. esculenta

208. Read the given statements and select the correct option.

Statement 1: Blood is colourless in the insects.

Statement 2: Insect blood has no role in O_2 transport.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

209. Identify the animal (A) and name the phylum to which it belongs (B).



- a) A-Balanoglossus, B-Hemichordata
- b) A-Balanoglossus, B-Cephalochordata
- c) A-Nereis, B-Urochordata
- d) A-Nereis, B-Annelida

210. Which of the following features is not present in the Phylum Arthropoda?

- a) Jointed appendages
- b) Chitinous exoskeleton
- c) Metameric Segmentation
- d) Parapodia

211. Match animals given in column B with their respective mode of locomotion from column A and select the correct option.

Column A	Column B
w. Ciliary locomotion	I. Earthworm
x. Looping movements	II. Nereis
y. Alternate movements of multiple limbs	III. Crab
z. Circular and longitudinal muscles in the body	IV Planaria
	V. Amoeba
	VI. Leech

- a) w-I, x-II, y-III, z-IV
- b) w-V, x-VI, y-IV, z-III
- c) w-IV, x-III, y-II, z-I
- d) w-IV, x-VI, y-II, z-I

212. **Assertion:** Osteichthyes fishes swim constantly to avoid sinking.

Reason: Air bladder is absent in fishes of Class Osteichthyes.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

213. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Choanocytes	(i) Platyhelminthes
B. Cnidoblasts	(ii) Ctenophor
C. Flame cells	(iii) Porifera
D. Nephridia	(iv) Coelenterata
E. Comb plates	(v) Annelida

a) A-(ii), B-(i), C-(iv), D-(v). E-(iii) b) A-(ii), B-(iv), C-(i), D-(v). E-(iii)

c) A-(v). B-(i), C-(iii), D-(ii), E-(iv) d) A-(iii), B-(iv), C-(i), D-(v). E-(ii)

214. Diploblastic and triploblastic are terms that describe

a) the number of invaginations during embryonic development

b) the number of heads during embryonic development

c) the number of germinal layers during embryonic development

d) the number of cell types during dev

215. Which of the following is wrongly matched?

a) Haemoglobin in RBC - mammals b) Haemozoin - Plasmodium cytoplasm

c) Haemocyanin - prawn d) Haemoglobin dissolved in blood - Pheretima

216. **Assertion:** Claspers are a distinguishing feature of males in Class Chondrichthyes.

Reason: Claspers help in copulation.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

217. Which of the following is an exclusive character of Class Mammalia?

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- a) Internal fertilisation b) Presence of a completely 4-chambered heart
c) Homoiothermy d) Presence of a muscular diaphragm

218. Ecdysis is shedding of _____ .

- a) stratum corneum b) epidermis c) dermis d) stratum malpighi

219. The figure of *Labeo rohita* is given below. Identify the parts labelled as A, B, C, D and E.



a)

A	B	C	D	E
Anal fin	Dorsal fin	Caudal fin	Pectoral fin	Pelvic fin

b)

A	B	C	D	E
Anal fin	Caudal fin	Dorsal fin	Pectoral fin	Pelvic fin

c)

A	B	C	D	E
Dorsal fin	Caudal fin	Anal fin	Pelvic fin	Pectoral fin

d)

A	B	C	D	E
Dorsal fin	Caudal fin	Pectoral fin	Anal fin	Pelvic fin

220. Transfer of *Taenia* to secondary host occurs as _____ .

- a) oncosphere b) cysticercus c) morula d) egg

221. One of the following is a very unique feature of the mammalian body:

- a) Four chambered heart b) Ribcage c) Homeothermy
d) Presence of diaphragm

222. Pneumatic bones are expected to be found in _____ .

- a) pigeon b) house lizard c) frog's tadpole d) flying fish

223. Read the given statements and select the correct option.

Statement 1: Cephalochordata bears notochord throughout their life.

Statement 2: In cephalochordates, notochord extends from head to tail.

- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

224. Which one of the following is a matching set of a phylum and its three examples?

- a) Platyhelminthes-Planaria, Schistosoma, Enterobius
b) Mollusca - Loligo, Teredo, Octopus
c) Porifera - Spongilla, Euplectella, Pennatula
d) Cnidaria - Bonellia, Physalia, Amelia

225. Which one of the following living organisms completely lacks a cell wall?

- a) Cyanobacteria b) Sea-fan(Gorgonia) c) Saccharomyces
d) Blue-green algae

26. Match the name of the animals (Column I) with one characteristic (Column II) and the phylum/class (Column III) to which it belongs.

a)

Option	Column I	column II	column III
(a)	Petromyzon	Ectoparasite	Cyclostomata

b)

Option	Column I	column II	column III
(b)	Ichthyophis	Terrestrial	Reptilia

c)

Option	Column I	column II	column III
(c)	Limulus	Body covered by chitinous exoskeleton	Pisces

d)

Option	Column I	column II	column III
(d)	damsia	Radially symmetrical	Porifera

27. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Protochordata	(i) Delphinus
B. Limbless amphibia	(ii) Myxine
C. Oviparous mammal	(iii) Ornithorhynchus
D. Aquatic mammal	(iv) Doliolum
E. Jawless vertebrate	(v) Ichthyophis

- a) A-(v), B-(iv), C-(iii), D-(i), E-(ii) b) A-(iv), B-(v), C-(iii), D-(i), E-(ii)
c) A-(iv), B-(v), C-(iii), D-(ii), E-(i) d) A-(v), B-(iii), C-(i), D-(ii), E-(iv)

28. Point out a non-parasite _____.

- a) tapeworm b) mosquito c) leech d) sea anemone

29. Trachea of cockroach and mammal are similar in having _____.

- a) paired nature b) non-collapsible walls c) ciliated inner lining
d) origin from head

30. A wood boring mollusc/shipworm is _____.

- a) Chiton b) Teredo c) Umax d) Patella

31. If a live earthworm is pricked with a needle on its outer surface without damaging its gut, the fluid that comes out is

- a) Coelomic fluid b) Haemolymph c) Slimy mucus d) Excretory fluid.

32. The cervical vertebrae in humans is _____.

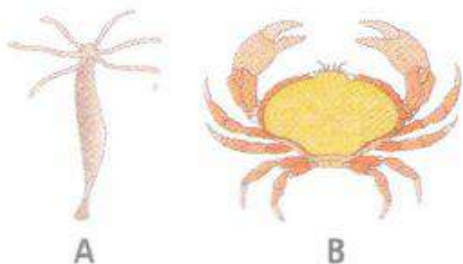
- a) same as in whale b) more than that in rabbit c) double than that of horse
d) less than that in giraffe
233. Which of the following are correct?
(i) Sponges: Cellular level of organisation
(ii) Cnidaria: Tissue level of organisation
(iii) Platyhelminthes: Organ level of organisation
(iv) Annelids, Arthropods, Molluscs, Echinoderms and Chordates: Organ system level of organisation
a) (i) and (ii) only b) (ii) and (iv) only c) (ii) and (iii) only
d) (i), (ii), (iii) and (iv)
234. Which one of the following phyla is correctly matched with its two general characteristics?
a)
Echinodermata - pentamerous radial symmetry and mostly internal fertilisation
b)
Mollusca - normally oviparous and development through a trochophore or veliger larva
c)
Arthropoda - body divided into head, thorax and abdomen and respiration by mouth
d)
Chordata - notochord persists throughout and separate anal and urinary openings to the outside
235. An insect regarded as greatest mechanical carrier of diseases is _____
a) Pediculus b) Cimex c) Musca d) Xenopsylla
236. Consider the following statements (A-D) each with one or two blanks.
A. Four characters of chordates are the presence of (i), dorsal hollow nervous system, (ii) and muscular tail.
B. Agnatha are the most primitive craniates. They are commonly called (iii) vertebrates.
C. Electric ray belongs to Class (iv) while sea horse belongs to class (v).
D. (vi) are also defined as feathered bipeds. These have a (vii) gland on the tail.
Which one of the following options, correctly fills any two of the given statements?
a) (iii)-jawless, (iv)-Osteichthyes, (v)-Chondrichthyes
b) (i)-notochord, (ii)-pharyngeal gill slits, (iv)-Chondrichthyes, (v)-Osteichthyes

- c) (iii)-jawed, (vi)-Reptiles, (vii)-urophygial
d) (i)-four-chambered heart, (ii)-pharyngeal gill slits, (vi)-Birds, (vii)-urophygial
237. Which one of the following statements is incorrect about the occurrence of notochord?
- a) It is present only in larval tail in ascidian.
b) It is replaced by a vertebral column in adult frog.
c) It is absent throughout life in humans from the very beginning
d) It is present throughout life in Amphioxus.
238. Which one of these animals is not a homeotherm ?
- a) Camelus b) Cheone c) Macropus d) Psittacula
239. Which one of the following pairs of animals is similar to each other pertaining to the feature stated against them?
- a) Pteropus and Ornithorhynchus - viviparity
b) Garden lizard and Crocodile - three chambered heart
c) Ascaris and Ancylostoma metameric segmentation
d) Sea horse and Flying fish - cold blooded Flying fish (poikilothermal)
240. What is true about Taenia saginata _____ .
- a) Life history has pig as intermediate host
b) There are two large suckers on scolex c) Rostellar hooks are absent
d) Rostellum has double circle of hooks
241. The statements given below shows some characteristics of a phylum. Identify it.
- (i) Tissue absent
(ii) Internal fertilisation
(iii) Development is indirect
(iv) Spongocoelate with ostia (many) and single osculum and canal system
(v) Sexes are hermaphrodite.
- a) Cnidaria b) Porifera c) Platyhelminthes d) Ctenophora
242. Which one belongs to Platyhelminthes?
- a) Schistosoma b) Trypanosoma c) Plasmodium d) Wuchereria
243. What is common between ostrich, penguin and kiwi?
- a) Running birds b) Migratory birds c) Flightless birds d) Four toed birds
244. Given below are types of cells present in some animals. Which of the following cells can differentiate to perform different functions?
- a) Choanocytes b) Interstitial cells c) Gastrodermal cells d) Nematocytes
245. Association between sucker fish (Remora) and shark is _____ .
- a) commensalism b) symbiosis c) predation d) parasitism

246. A jawless fish, which lays eggs in fresh water and whose ammocoetes larvae after metamorphosis return to the ocean is _____ .
a) Myxine b) Neomyxine c) Petromyzon d) Eptatretus
247. Identify the aquatic mammal(s) from the following.
(i) Balaenoptera
(ii) Equus
(iii) Delphinus
(iv) Pteropus
(v) Felis
a) (i) and (iii) b) (ii) and (iv) c) (v) only d) (iv) and (v)
248. The long bones are hollow and connected by air passage. They are the characteristics of _____ .
a) Aves b) mammals c) Reptilia d) land vertebrates
249. Which of the following is not a characteristic feature of sponges?
a) Cellular level of organisation b) Presence of ostia c) Intracellular digestion
d) Body supported by chitin
250. Blood of Pheretima is _____ .
a) blue with haemocyanin in corpuscles b) blue with haemocyanin in plasma
c) red with haemoglobin in corpuscles d) red with haemoglobin in plasma
251. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
A.	Hirudin	(i)	Hydra
B.	Canal system	(ii)	Echinodermata
C.	Nematocysts	(iii)	Leech
D.	Feather star	(iv)	Sponges
E.	Insects	(v)	Termites

- a) A-(iv), B-(iii), C-(ii), D-(i), E-(v) b) A-(v), B-(iv), C-(i), D-(iii), E-(ii)
c) A-(iii), B-(iv), C-(i), D-(ii), E-(v) d) A-(ii), B-(i), C-(iv), D-(v), E-(iii)
252. Identify type of symmetry in the given animals A and B.



a)

A	B
Bilateral	Asymmetrical

b)

A	B
Bilateral	Bilateral

c)

A	B
Radial	Bilateral

d)

A	B
Radial	Radial

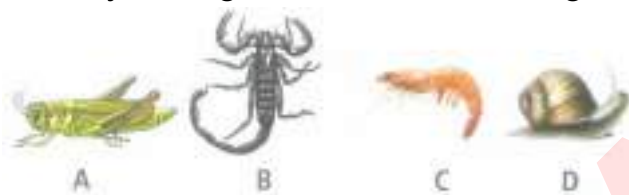
253. Choose the correct statement

- a) All mammals are viviparous
- b) All cyclostomes do not possess jaws and paired fins
- c) All reptiles have three chambered heart
- d) All pisces have gills covered by an operculum

254. Gorilla, chimpanzee, monkeys and human belong to the same _____.

- a) species b) genus c) family d) order

255. Identify the figures A, B, C and D given below and select the correct option.



- a) A-Locust, B-Scorpion, C-Prawn, D-Pila
- b) A-Locust, B-Prawn, C-Scorpion, D-Pila
- c) A-Locust, B-Scorpion, C-Prawn, D-Snail
- d) A-Butterfly, B-Scorpion, C-Prawn, D-Pila

256. Match the following list of animals with their level of organisation.

Division of Labour	Animal
A. Organ level	i. Pheretima
B. Cellular aggregate level	ii. Fasciola
C. Tissue level	iii. Spongilla
D. Organ system level	iv. Obelia

Choose the correct match showing division of labour with animal example.

- a) i-B, ii-C, iii-D and iv-A b) i-B, ii-D, iii-C and iv-A c) i-D, ii-A, iii-B and iv-C
- d) i-A, ii-D, iii-C and iv-B

257. Which one of the following is not a poisonous snake?

- a) Platypus b) Viper c) Python d) Krait

258. In case of poriferans the spongocoel is lined with flagellated cells called:

- a) Ostia b) Oscula c) Choanocytes d) Mesenchymal cells

259. **Assertion:** Calotes, Crocodilus and Chelone are members of Class Reptilia.

Reason: Heart is three chambered in Calotes, Crocodilus and Chelone.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

260. Among the following organisms which is a completely non-parasitic form?

a) Sea anemone b) Tapeworm c) Leech d) Mosquito

261. Match column I with column II and select the correct option from the given codes.

Column I		Column II
A. Wings	(i)	Reptiles
B. Operculum	(ii)	Chondrichthyes
C. Scutes	(iii)	Birds
D. Cartilaginous endoskeleton	(iv)	Osteichthyes

a) A-(iii), B-(i), C-(iv), D-(ii) b) A-(i), B-(iii), C-(iv), D-(ii)

c) A-(iv), B-(iii), C-(ii), D-(i) d) A-(iii), B-(iv), C-(i), D-(ii)

262. Match the column A with column B and choose the correct option.

Column A	Column B
A. Porifera	i. Canal system
B. Aschelminthes	ii. Water-vascular system
C. Annelida	iii. Muscular pharynx
D. Arthropoda	iv. Jointed appendages
E. Echinodermata	v. Metameres

a) A-ii, B-iii, C-v, D-iv, E-i b) A-ii, B-v, C-iii, D-iv, E-i c) A-i, B-iii, C-v, D-iv, E-ii

d) A-i, B-v, C-iii, D-iv, E-ii

263. Which one of the following animals has two separate circulatory pathways?

a) Frog b) Lizard c) Whale d) Shark

264. Animals/organisms floating on the surface of water are _____.

a) plankton b) pelagic c) benthos d) neritic

265. *Ascaris lumbricoides* infection occurs through _____.

a) sole of uncovered feet b) contaminated food & water

c) improperly cooked meaty pork d) from air through inhalation

266. Identify the given figures A, B and C and select the correct option.



a)

A	B	C
Sycon	Euspongia	Spongilla

b)

A	B	C
Euspongia	Spongilla	Sycon

c)

A	B	C
Spongilla	Sycon	Euspongia

d)

A	B	C
Euspongia	Sycon	Spongilla

267. In most simple type of canal system of Porifera, which of the following ways exhibit water flow?

- a) Ostia → Spongocoel → Osculum → Exterior
- b) Spongocoel → Ostia → Osculum → Exterior
- c) Osculum → Spongocoel → Ostia → Exterior
- d) Osculum → Ostia → Spongocoel → Exterior

268. Which is not a true amphibian animal?

- a) Salamander b) Toad c) Tortoise d) Frog

269. In which one of the following sets of animals do all the four give birth to young ones?

- a) Lion, Bat, Whale, Ostrich b) Platypus, Penguin, Bat, Hippopotamus
- c) Shrew, Bat, Cat Kiwi d) Kangaroo, Hedgehog, Dolphin, Loris

270. The flightless bird among the following is

- a) Columba b) Neophron c) Struthio d) Corvus.

271. In which of the following notochord is present in embryonic stage?

- a) All chordates b) Some chordates c) Vertebrates d) Nonchordates

272. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Ammocoete larva	(i) Sea horse
B. Crocodiles	(ii) Penguin
C. Fish	(iii) Lamprey
D. Bird	(iv) Reptilia
E. Mammal	(v) Bat

- a) A-(iii), B-(iv), C-(i), D-(ii), E-(v) b) A-(i), B-(iv), C-(v), D-(ii), E-(iii)
- c) A-(v), B-(iii), C-(ii), D-(iv), E-(i) d) A-(iv), B-(ii), C-(i), D-(iii), E-(v)

273. **Assertion:** Cnidoblasts are present on the tentacles and the body in cnidarians.

Reason: Cnidoblasts are used for anchorage, defence and capture of the prey.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

274. **Assertion:** In molluscs, feather-like gills are present in mantle cavity.

Reason: These gills have respiratory and excretory functions.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

275. A common characteristic of all vertebrates without exception is

a) the division of body into head, neck, trunk and tail

b) their body covered with an exoskeleton

c) the possession of two pairs of functional appendages

d) the presence of well-developed skull.

276. Select the correct option in respect of characteristics of each group.

	Cyclostomes	Chondrichthyes	Osteichthyes
(i)	Sucking mouth	Ventral mouth	Terminal mouth
(ii)	Scales absent	Placoid scales	Cycloid/Ctenoid scales
(iii)	Marine	Marine	Marine and freshwater
(iv)	6-15 pairs of gills	5-7 pairs of gills without operculum	4 pairs of gills with operculum

a) (i) and (ii) are correct b) (i) and (iv) are correct c) Only (iii) is correct

d) All are correct.

277. Planaria possess high capacity of

a) Metamorphosis b) Regeneration c) Alternation of generation

d) Bioluminescence

278. Which of the following is not a correct match of animal and its habitat?

- a) Hydra vulgaris - Sea water b) Hydra gangetica - Freshwater
c) Obelia - Sea water d) Physalia - Sea water
279. Which of the following group is formed of only the hermaphrodite organisms?
a) Earthworm, tapeworm, housefly, frog
b) Earthworm, tapeworm, sea horse, housefly
c) Earthworm, leech, sponge, roundworm
d) Earthworm, tapeworm, leech, sponge
280. **Assertion:** Air sacs are connected to lungs in Class Aves.
Reason: Air sacs supplement respiration in birds.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
281. Which one of the following animals possesses nerve cells but no nerves?
a) Hydra b) Tapeworm c) Earthworm d) Frog's tadpole
282. Which of the following is a correct sequence of decreasing order of number of species?
a) Aves, pisces, reptiles, amphibians, mammals
b) Pisces, aves, reptiles, mammals, amphibians
c) Pisces, mammals, reptiles, amphibians, aves
d) Amphibians, aves, pisces, mammals, reptiles
283. Match the animal names listed under column I with the zoological names given under column II and select the correct option from the given codes.
- | Column I (Common name) | Column II |
|------------------------|-----------------|
| A. Starfish | (i) Sepia |
| B. Jellyfish | (ii) Asterias |
| C. Devilfish | (iii) Aurelia |
| D. Cuttlefish | (iv) Octopus |
| | (v) Hippocampus |
- a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(iii), B-(iv), C-(i), D-(v)
c) A-(ii), B-(i), C-(iv), D-(iii) d) A-(v), B-(i), C-(iv), D-(ii)
284. Classification of Porifera is based on _____.
a) branching b) spicules c) reproduction d) symmetry

285. The similarity of bone structure in the forelimbs of many vertebrates is an example of _____ .
a) convergent evolution b) analogy c) homology d) adaptive radiation
286. Hair occur in all mammals except those of _____ .
a) Rodentia b) Chiroptera c) Primata d) Cetacea
287. Identify the vertebrate group of animals characterized by crop and gizzard in its digestive system:
a) Aves b) Reptilia c) Amphibia d) Osteichthyes
288. Radial symmetry is usually associated with _____ .
a) aquatic mode of life b) lower grade of organisation
c) creeping mode of locomotion d) sedentary mode of life
289. Which of the following animals is not viviparous?
a) Whale b) Flying fox (Bat) c) Elephant d) Platypus
290. Which of the following characters is absent in all chordates except mammals?
a) Sternum b) Coelom c) Mammary glands d) Dorsal nerve cord
291. Eutherians are characterised by _____ .
a) hairy skin b) true placentation c) ovoviviparity d) glandular skin
292. The limbless amphibian is
a) Ichthyophis b) Hyla c) Rana d) Salamandra.
293. Which of the following classes is incorrectly matched with its general characters?
a)
Cyclostomata: Lack jaws and paired fins and body is covered with placoid scales
b)
Osteichthyes: Four pairs of gills are covered with an operculum and skin is covered with cycloid scales
c) Reptilia: Tympanum represents ear and fertilisation is internal
d)
Aves: Endoskeleton is fully ossified and long bones are hollow with air cavities called as pneumatic bones. Cyclostomes have a sucking and circular mouth without jaws. Their body is devoid of scales and paired fins. Cyclostomes have a sucking and circular mouth without jaws. Their body is devoid of scales and paired fins.
294. Pheretima posthuma is highly useful as _____ .

a) their burrows make the soil loose

b)

they make the soil porous, leave their castings and take organic debris in the soil

c) they are used as fish meal

d) they kill the birds due to biomagnification of chlorinated hydrocarbons

295. Match the following columns and select the correct option.

Column-I	Column-II
(a) Gregarious polyphagous pest	(i) Asterias
(b) Adult with radial symmetry and larva with bilateral symmetry	(ii) Scorpion
(c) Book lungs	(iii) Ctenoptana
(d) Bioluminescence	(iv) Locusta

a)

b)

c)

d)

(a)(b)(c)(d)

(a)(b)(c)(d)

(a)(b)(c)(d)

(a)(b)(c)(d)

(a)(iii)(ii)(i)(iv)

(b)(ii)(i)(iii)(iv)

(c)(i)(iii)(ii)(iv)

(d)(iv)(i)(ii)(iii)

296. The characteristics given below are associated with

(i) Body is covered by dry and cornified skin, epidermal scales or scutes

(ii) They have no external ear

(iii) Crawling, creeping habit

(iv) 3 chambered heart

a) reptile b) bird c) amphibian d) Osteichthyes.

297. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Cartilaginous fishes	(i) Usually external fertilisation
B. Bony fishes	(ii) Internal fertilisation
	(iii) Mostly oviparous
	(iv) Mostly viviparous
	(v) Direct development

a) A-(i), (iii), (v); B-(ii), (iv) b) A-(ii), (iv); B-(i), (iii), (v)

c) A-(iii), (v); B-(i), (ii), (iv) d) A-(i), (ii), (iv); B-(iii), (v)

298. Which one of the following pairs is mismatched?

- a) Bombyx mori - Silk b) Pila globosa - Pearl c) Apis indica - Honey
d) Laccifer lacca - Lac

99. What is common among crab and honeybee?

- a) Jointed legs b) Metamorphosis c) Compound eyes d) Poison glands

100. Select the correct option that represents examples of the following types of animals.

(i) Cold blooded animal

(ii) Warm blooded animal

(iii) Animal possessing dry and cornified skin

(iv) Hermaphrodite animal

a)

(i)	(ii)	(iii)	(iv)
Frog	Pigeon	Wall lizard	Earthworm

b)

(i)	(ii)	(iii)	(iv)
Pigeon	Frog	Crocodile	Hydra

c)

(i)	(ii)	(iii)	(iv)
Rabbit	Fish	Frog	Earthworm

d)

(i)	(ii)	(iii)	(iv)
Fish	Frog	Wall lizard	StarFish



Ravi Maths Tuition Centre

Time : 1 Mins

MORPHOLOGY OF FLOWERING PLANTS 1

Marks : 1298

1. Select the group of plants that possess stilt roots
 - a) Zea mays, Rhizophora mangal
 - b) Pandanus odoratissimus, Ficus benghalensis
 - c) Ficus benghalensis, Pisum sativum
 - d) Ficus benghalensis, Pisum sativum

2. Match the following

(a) Mustard	(i) Liliaceae
(b) Mulaithi	(ii) Solonaceae
(c) Ashwagandha	(iii) Fabaceae
(d) Tulip	(iv) Brassicaceae

- a) a (iv), b (iii), c (ii), d (i)
 - b) a (iv), b (iii), c (i), d (ii)
 - c) a (iii), b (iv), c (ii), d (i)
 - d) a (i), b (ii), c (iii), d (iv)
3. The type of placentation in which ovary is syncarpous, unilocular and ovules on sutures is called _____.
 - a) Apical placentation
 - b) Parietal placentation
 - c) Marginal placentation
 - d) Superficial placentation
 4. Leaf tendrils are found in:
 - a) Pea
 - b) Cucumber
 - c) Grape vine
 - d) All of the above
 5. The swollen end of the stalk of flower is called
 - a) Pedicel
 - b) null
 - c) Petiole
 - d) Rachis
 6. A small rootless aquatic herb in which a portion of leaf forms a tiny sack or bladder which traps water insects is
 - a) Dionaea
 - b) Utricularia
 - c) Sarracenia
 - d) Drosera.
 7. Root shows negative geotropism in
 - a) Pothos
 - b) Ficus
 - c) Grass
 - d) Rhizophora
 8. Which of the following is a correct combination of family and its respective members?
 - a) Fabaceae - Colchicum autumnale, Trifolium alexandrinum
 - b) Solanaceae - Withania somnifera, Petunia
 - c) Liliaceae - Sesbania, Asparagus
 - d) Asteraceae - Sonchus asper, Nicotiana tabacum
 9. Match the following

(a) Hypogynous	(i) Lily
----------------	----------

(b) Perigynous	(ii) Cucumber, Ray florets of sunflower
(c) Epigynous	(iii) Plum, Peach
(d) Perianth	(iv) Chinrose, Brinjal

- a) a (iv), b (i), c (ii), d (iii) b) a (iv), b (ii), c (iii), d (i) c) a (iii), b (ii), c (iv), d (i)
d) a (iii), b (iv), c (ii), d (i)

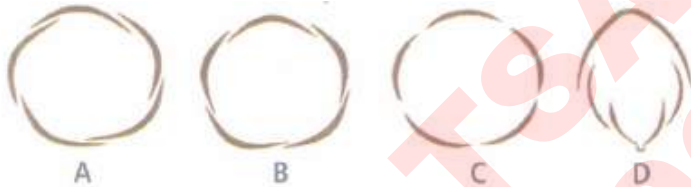
10. Vivipary is _____ .

- a) Seed germination with subterranean cotyledons
b) Seed germination with epiterranean cotyledons
c) Fruit development without pollination
d) Seed germination inside the fruit while attached to the plant

11. Find the correct match w.r.t plant and its family

- a) Colochicine - Liliaceae b) Chilli - Brassicaceae c) Mulethi - Solanaceae
d) Capsella - Fabaceae

12. Identify the different types of aestivation (A, B, C and D) and select the correct option.



- a) (a) Valvate Twisted Imbricate Vexillary b) Imbricate Twisted Valvate Vexillary
c) Twisted Imbricate Vexillary Valvate d) Twisted Imbricate Valvate Vexillary

13. _____ inflorescence is a compact spike-like inflorescence with small unisexual flowers

- a) Spike b) Corymb c) Catkin d) Umbel

14. Proximal end of the filament of stamen is attached to the _____ .

- a) Anther b) Connective c) Placenta d) Thalamus or petal

15. Read the following statements.

- (i) In *Limnophila heterophylla*, the lamina of submerged leaves is very much dissected while the lamina of aerial leaves is entire. This variation in the form of lamina is referred to as _____
(ii) Potato tubers, when exposed to light, turn green due to the increased production of a glycoalkaloid named _____
(iii) In _____, ovary arises from the bottom of the cup-shaped thalamus and androperianth arises from the rim of the cup-shaped thalamus
(iv) Underground stems can be differentiated from roots by _____ of axillary buds on the nodes. Select the correct fill-ups out of the following for the above statements

a)

(i)	(ii)	(iii)	(iv)
developmental heterophylly	solanine	Rosa	presence

b)

(i)	(ii)	(iii)	(iv)
environmental heterophylly	solanine	Prunus	presence

c)

(i)	(ii)	(iii)	(iv)
environmental heterophylly	chlorophyll	Prunus	absence

d)

(i)	(ii)	(iii)	(iv)
adaptive heterophylly	lycopene	Cucurbita	absence

16. An example of axile placentation is:

- a) Dianthus b) Lemon c) Marigold d) Argemone

17. Parallel venation is a characteristic of monocots. Which of the following is an exception to this generalisation?

- a) Smilax b) Colocasia c) Alocasia d) All of these

18. Modified stem into green, flattened structure for assimilatory function is:

- a) Phyllode b) Phylloclade c) offset d) Thorn

19. Identify the family which shows the following diagnostic features.

Flowers pentamerous, gynoecium-bicarpellary, syncarpous, ovary placed obliquely, placentation axile, placenta swollen.

- a) Solanaceae b) Leguminosae c) Papilionaceae d) Liliaceae

20. Unbranched, erect, cylindrical stout axis with distinct nodes and internodes and with jointed appearance is called as

- a) runner b) Zygomorphic, hypogynous with imbricate aestivation c) culm d) caudex.

21. Oil reserve of groundnut is present in _____.

- a) Embryo b) Cotyledons c) Endosperm d) Underground tubers

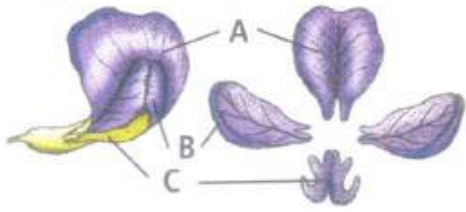
22. Whorled, simple leaves with reticulate venation are present in _____.

- a) Calotropis b) Neem c) China rose d) Alstonia

23. The ovary is half inferior in flowers of:

- a) Guava b) Peach c) Cucumber d) Cotton

24. Select the correct option for A, B and C in the given diagram of papilionaceous corolla.



a)

A	B	C
Keel	Wings	Vexillum

b)

A	B	C
Vexillum	Keel	Wings

c)

A	B	C
Vexillum	Wings	Keel

d)

A	B	C
Wings	Keel	Vexillum

25. The symbol $K_{2+2} C_{x4} A_{2+4}$ represents which one of the following family?

a) Solanaceae b) Brassicaceae c) Potato family d) Lily family

26. Select the mismatched pair out of the following

- a) Rhizome - *Dryopteris*, *Nelumbo nucifera*
 b) Corm - *Crocus sativus*, *Amorphophallus*
 c) Sucker - *Curcuma domestica*, *Zingiber officinale*
 d) Tuber - *Helianthus tuberosus*, *Solanum tuberosum*

27. The arrangement of sepals of petals in *Calotropis* is

a) Valvate b) Twisted c) Imbricate d) Vexillary

28. Syngenesious condition of stamens is found in Family

a) Asteraceae b) Liliaceae c) Cruciferae d) Malvaceae

29. In *Bougainvillea* thorns are the modification of :

a) Stipules b) Adventitious root c) Stem d) Leaf

30. Plants which produce characteristic pneumatophores and show vivipary belong to:

a) Halophytes b) Psammophytes c) Hydrophytes d) Mesophytes

31. Which is not a stem modification

a) Rhizome of ginger b) Corm of *Colocasia* c) Pitcher of *Nepenthes*
 d) Tuber of potato

32. Spines present on the areoles of *Opuntia* represent

a) stem b) leaves c) buds d) phyllodes.

33. Match the columns and choose the correct option

Column I (Fruit)	Column II (Edible part)
a) Walnut	I) Cotyledon
b) Cashewnut	II) Seed

Column I (Fruit)	Column II (Edible part)
c) Orange	III) Endocarp
d) Strawberry	IV) Thalamus

- a) a-II, b-I, c-III, d-IV b) a-II, b-III, c-I, d-IV c) a-I, b-II, c-IV, d-III
d) a-I, b-II, c-III, d-IV

34. Regarding to androecium of given families. Match the following

(a) Brassicaceae	(i) 2+4
(b) Fabaceae	(ii) Diadelphous
(c) Solonaceae	(iii) Epipetalous
(d) Liliaceae	(iv) Six stamens in two whorl 3+3

- a) a (iv), b (ii), c (iii), d (i) b) a (i), b (ii), c (iii), d (iv) c) a (iv), b (iii), c (ii), d (i)
d) a (ii), b (i), c (iv), d (iii)

35. Tetradyanamous conditions occur in

- a) Cruciferae b) Malvaceae c) Solonaceae d) Liliaceae

36. Tetradynamous stamens are found in family _____.

- a) Malvaceae b) Solanaceae c) Cruciferae d) Liliaceae

37. Pappus is modification of

- a) Bracts b) Corolla c) Calyx d) All

38. Cymose inflorescence is present in :

- a) Solanum b) Sesbania c) Trifolium d) Brassica

39. Vivipary is characteristics of _____.

- a) Mesophytes b) Xerophytes c) Hygrophytes d) Halophytes

40. Which kind of placentation is represented by the given figure?



- a) Marginal b) Axile c) Parietal d) Basal

41. Which of the following represents the edible part of the fruit Litchi

- a) Endocarp b) Pericarp c) Juicy aril d) Mesocarp

42. The 'eyes' of the potato tuber represent

- a) nodes b) root buds c) flower buds d) leaf buds

43. The edible part of turnip is

- a) Modified Adventitious roots b) Modified tap root c) Stem
d) Underground stem

44. Placentation in tomato and lemon is :

- a) Marginal b) Axile c) Parietal d) Free-central

45. Match the following

(a) Valvate	(i) Chinrose
(b) Twisted	(ii) Calotropis
(c) Imbricate	(iii) Pea
(d) Vexillary	(iv) Cassia

- a) a (ii), b (i), c (iv), d (iii) b) a (ii), b (iii), c (iv), d (i) c) a (i), b (ii), c (iii), d (iv)
 d) a (iv), b (iii), c (ii), d (i)

46. A simple leaf can be differentiated from the pinnae of a compound leaf on the basis of presence or absence of :

- a) number of pinnae b) shape of lamina c) axillary bud d) lateral buds

47. Stem modified into leaf like structure and leaves are changed into spines in

- a) Phyllode b) Tuber c) Phylloclade d) All the above

48. The gynoecium consists of many free pistils in flowers of _____ .

- a) Aloe b) Tomato c) Papaver d) Michelia

49. Assertion: In imbricate aestivation, out of five petals one is completely internal, one is completely external and in each of the remaining three petals, one margin is internal and the other is external

Reason : Ascending imbricate aestivation is found in Cassia and gulmohur

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

50. In _____ phyllotaxy, a pair of leaves arise at each node and lie opposite to each other as in _____ plant

- a) alternate, Hibiscus b) opposite, Hibiscus c) opposite, Calotropis
 d) whorled, Calotropis

51.



Select the incorrect statement regarding the given figure.

- a) It represents the baccate fruit of *Lycopersicum esculentum*.
 b) It is derived from a monocarpellary apocarpous gynoecium.
 c) It represents the true berry of tomato. d) Both (b) and (c)

52. In turmeric, stem is a

- a) Tuber b) Bulb c) Rhizome d) Corm

53. In __ (i) __ type of inflorescence, main axis terminates in a flower, hence is limited in growth and flowers are borne in __ (ii) __ succession.

a)

(i)	(ii)
racemose	acropetal

b)

(i)	(ii)
racemose	basipetal

c)

(i)	(ii)
cymose	acropetal

d)

(i)	(ii)
cymose	basipetal

54. In _____ flowers, margin of thalamus grows upward enclosing the ovary completely and getting fused with it.

a) hypogynous b) perigynous c) epigynous d) both (b) and (c)

55. In china rose the flowers are :

- a) Actinomorphic, epigynous with valvate aestivation
- b) Zygomorphic, hypogynous with imbricate aestivation
- c) Zygomorphic, epigynous with twisted aestivation
- d) Actinomorphic, hypogynous with twisted aestivation

56. Edible part of apple and pear is

a) epicarp b) mesocarp c) mesocarp d) thalamus

57. The coconut water and the edible part of coconut are equivalent to:

a) Endosperm b) Endocarp c) Mesocarp d) Embryo

58. Cross from corolla is found in

a) Cruciferae b) Compositae c) Leguminosae d) Malvaceae

59. Which of the following represents the edible swollen portion of *Allium cepa*?

a) Aerial stem b) Underground stem c) Internodes d) Leaf bases

60. Marginal placentation is generally found in Family

a) Leguminosae b) Cucurbitaceae c) Malvaceae d) Brassicaceae.

61. *Nicotiana*, *petunia* belong to

a) Malvaceae b) Liliaceae c) Solonaceae d) Cruciferae

62. Which part of the coconut produces coir?

a) Seed coat b) Mesocarp c) Epicarp d) Pericarp

63. Replum is present in the ovary of flower of _____ .

a) Lemon b) Mustard c) Sunflower d) Pea

64. Water melon is

a) Pome fruit b) Sorosis fruit c) Pepo fruit d) Drupe fruit

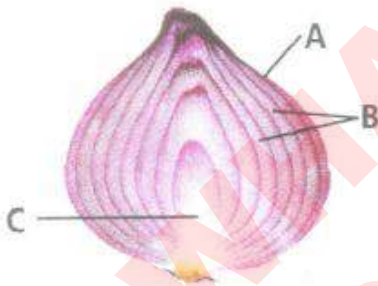
65. In albuminous seeds, food is stored in _____ and in exalbuminous seeds, food is stored in _____

a) endosperm, cotyledons b) cotyledons, cotyledons c) cotyledons, endosperm
d) endosperm, endosperm

66. Perigynous flowers are found in :

a) Rose b) Guava c) Cucumber d) China rose

67. Standard (Vexillum) in Papilionatae (Fabaceae) is
 a) Posterior outer most b) Posterior inner most c) Anterior outer most
 d) Anterior inner most
68. Among China rose, Mustard, Brinjal, Potato, Guava, Cucurbita, Onion and Tulip, how many plants have superior ovary?
 a) Five b) Six c) Three d) Four
69. Read the given statements and select the correct option
Statement 1: Root cap protects the root meristem from the friction of the soil and its outer cells are continuously replaced by newer ones.
Statement 2: The effect of the soil-friction damages the outer cells of root cap which are peeled off and replaced by new cells produced by root meristem
 a) Both statements 1 and 2 are correct
 b) Statement 1 is correct but statement 2 is incorrect
 c) Statement 1 is incorrect but statement 2 is correct. d) Hydrophytes
70. Seed coat is not thin, membranous in :
 a) Coconut b) Groundnut c) Gram d) Maize
71. The given figure represents the V.S. of bulb of *Allium cepa*. Identify the different parts and select the correct option



a)

A	B	C
Fleshy scales	Tunic	Terminal bud

b)

A	B	C
Tunic	Terminal bud	Fleshy scales

c)

A	B	C
Tunic	Fleshy scales	Terminal bud

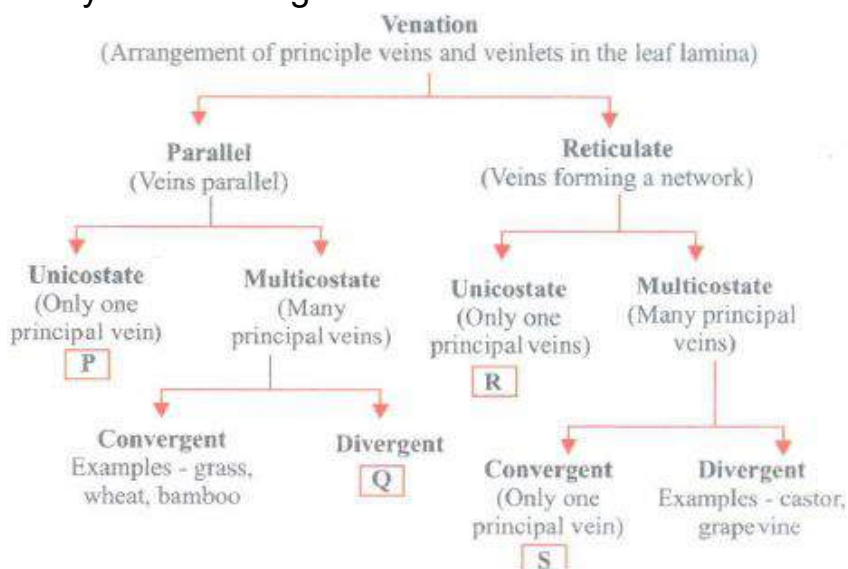
d)

A	B	C
Terminal bud	Fleshy scales	Tunic

72. Which one of the following statement is correct?
 a) The seed in grasses is not endospermic b) Mango is a parthenocarpic fruit.
 c) A proteinaceous aleurone layer is present in maize grain
 d) A sterile pistil is called a staminode
73. Shepherd's purse plant belongs to family
 a) Cruciferae b) Malvaceae c) Solonaceae d) Leguminosae

74. Which of the following represents the functions of veins in the leaves?
a) Transport of water and minerals b) Mechanical support
c) Transport of organic food material d) All of these
75. Sweet potato is a modified:
a) Stem b) Rhizome c) Tap root d) Adventitious root
76. In which of the following fruits the edible part is the aril?
a) Custard apple b) Pomegranate c) Orange d) Litchi
77. The plant, which bears clinging roots, is _____.
a) Trapa b) Orchid c) Screw pine d) Podostemon
78. Keel is the characteristic feature of flower of :
a) Tomato b) Tulip c) Indigofera d) Aloe
79. Pineapple (ananas) fruit develops from _____.
a) A multipistillate syncarpous flower
b) A cluster of compactly borne flowers on a common axis
c) A multilocular monocarpellary flower d) A unilocular polycarpellary flower
80. Which of the following plants is used to extract the blue dye?
a) Trifolium b) Indigofera c) Lupin d) Cassia
81. Roots developed from parts of the plant other than radicle are called
a) tap roots b) fibrous roots c) adventitious roots d) nodular roots
82. What type of placentation is seen in sweet pea?
a) Axile b) Free central c) Marginal d) Basal
83. Edible roots are found in
a) rice b) wheat c) potato d) sweet potato
84. Finely dissected leaf may be an adapta
a) xerophytes b) psammophytes c) halophytes d) hydrophytes
85. Monocotyledonous seeds possess a single cotyledon which is represented by
a) scutellum b) aleurone c) tegmen d) endosperm
86. In onion the swollen underground structure is
a) Root b) Rhizome c) Bulb d) Tuber
87. Select the pair which contains monocotyledonous families.
a) Solanaceae and Brassicaceae b) Fabaceae and Asteraceae
c) Liliaceae and Poaceae d) None of these
88. Among bitter gourd, mustard, brinjal, pumpkin, china rose, lupin, cucumber, sunhemp, gram, guava, bean, chilli, plum, petunia, tomato, rose, withania, potato, onion, aloe and tulip how many plants have hypogynous flower?
a) Ten b) Fifteen c) Eighteen d) Six
89. Axile placentation is present in _____.

- a) Lemon b) Peas c) Argemone d) Dianthus
90. A distinct monocot character shown by the flowers of Liliaceae is
a) Hypogynous flowers b) Actinomorphic flowers c) Trimerous flowers
d) Bisexual flowers
91. In an inflorescence where flowers are borne laterally in an acropetal succession, the position of the youngest floral bud shall be
a) proximal b) distal c) intercalary d) anywhere.
92. _____ In aestivation, sepals or petals in a whorl just touch one another at the margins, without overlapping, as is found in _____
a) valvate, Calotropis b) valvate, Hibiscus c) twisted, Calotropis
d) twisted, Hibiscus
93. Verticillaster inflorescence occurs in
a) Solonaceae b) Solonaceae c) Fabaceae d) Fabaceae
94. Many pulses of daily use belong to one of the families below (tick the correct answer).
a) Solanaceae b) Fabaceae c) Liliaceae d) Poceae
95. The coconut water from tender coconut represents _____.
a) endocarp b) fleshy mesocarp c) free nuclear proembryo
d) free nuclear endosperm
96. Ovary is said to be half inferior in which of the following conditions?
a) Hypogynous b) Perigynous c) Epigynous d) Both (b) and (c)
97. Ovary is one-chambered but it becomes two-chambered due to the formation of false septum in
a) Brassica b) Pisum c) Hibiscus d) Dianthus.
98. Lycopersicum esculentum (Tomato) belongs to family
a) Solonaceae b) Malvaceae c) Cruciferae d) Cucurbitaceae
99. Study the following flow chart and select the correct option for P, Q, R and S.



a)

P	Q	R	S
Banana, Canna	Fan palm	Mango, Peepal	Smilax, Zizyphus

b)

P	Q	R	S
Banana, Canna	Smilax, Zizyphus	Mango, Peepal	Fan palm

c)

P	Q	R	S
Mango, Peepal	Banana, Canna	Fan palm	Smilax, Zizyphus

d)

P	Q	R	S
Mango, Peepal	Fan palm	Smilax, Zizyphus	Banana, Canna

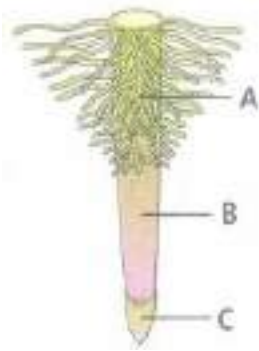
100. Ovary is half-interior in the flower of
a) Apple b) Guava c) Peach d) Garlic
101. If the gynoecium is present in the topmost position of the thalamus, then the flower is referred to as
a) hypogynous b) perigynous c) epigynous d) none of these.
102. pulvinus leaf base is the feature of
a) Mimosa b) gloriola c) Solanum d) Banana
103. Analogous structure of phylloclade is
a) Pitcher b) phyllode c) cladode d) Thorn
104. Assertion: The placentation in which the placenta forms a ridge along the ventral suture of ovary and ovules are borne on this ridge forming two rows is called parietal placentation.
Reason: The marginal placentation has ovules developed on the inner wall of the ovary or on peripheral part
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false. d) If both assertion and reason are false
105. The term polyadelphous is related to :
a) Calyx b) Gynoecium c) Androecium d) Corolla
106. A plant has a butterfly shaped flower with one standard, two wing like and two keel petals. The plant belongs to the Family
a) Papilionaceae b) Asteraceae c) Malvaceae d) Rubiaceae.

107. How many plants in the list given below have composite fruits that develop from an inflorescence Walnut, poppy, radish, fig, pineapple, apple, tomato, mulberry
_____ .
a) Four b) Five c) Two d) Three
108. Edible part of potato is
a) Inflorescence b) Leaves c) Roots d) Stem
109. The roots that originate from the base of the stem are:
a) Prop roots b) Lateral roots c) Fibrous roots d) Primary roots
110. Which floral conditions are represented by the symbols \oplus and % respectively?
a) Zygomorphic and actinomorphic flowers
b) Actinomorphic and zygomorphic flowers c) Hypogynous and epigynous flowers
d) Bisexual and unisexual flowers
111. The standard petal of a papilionaceous corolla is also called _____.
a) Carina b) Pappus c) Vexillum d) Corona
112. The term "Keel" is used for special type of
a) Sepals b) Petals c) Stamens d) Carpels
113. Free-central placentation is found in :
a) Dianthus b) Argemone c) Brassica d) Citrus
114. Pneumatophores occur in :
a) Carnivorous plants b) Free-floating hydrophytes c) Halophytes
d) Submerged hydrophytes
115. Radish is an example of
a) Fusiform root b) Napiform root c) Conical root d) Tuberous root
116. Which of the following plants possesses culm?
a) Cuscuta b) Zingiber c) Bamboo d) Cocos
117. Select the incorrect statement out of the following.
a) Assimilatory roots capable of photosynthesis are present in *Tinospora* and *Trapa*
b) Haustoria of *Cuscuta* make connections with both xylem and phloem tissues of host
c) Reproductive roots of *Ipomoea batata* help in vegetative propagation.
d) Epiphytic roots of *Vanda* possess well developed root caps and root hair.
118. Study carefully the given floral diagram and select the option which correctly represents the related floral formula.



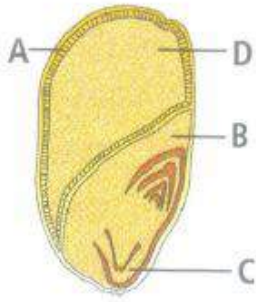
- (A) a) $\% \overset{\curvearrowright}{\underset{\curvearrowleft}{\oplus}} K_{(5)} C_{1+2+(2)} A_5 \overline{G}_{(2)}$ (B) b) $\oplus \overset{\curvearrowright}{\underset{\curvearrowleft}{\oplus}} K_{(5)} \overline{C}_5 \quad A_5 \underline{G}_{(2)}$ (C) c) $\oplus \overset{\curvearrowright}{\underset{\curvearrowleft}{\oplus}} P_5 + 5 A_{(5)} \underline{G}_{(2)}$
- (D) d) $\oplus \overset{\curvearrowright}{\underset{\curvearrowleft}{\oplus}} K_{(5)} \overline{C}_{(5)} \quad A_5 \underline{G}_{(2)}$

119. Which of the following statements is correct with respect to the given figure showing different zones of a typical root?



- a) Part B mainly helps in absorption of water.
 b) Quiescent centre is present in part B.
 c) Part A is most suitable for anatomical studies of root.
 d) Differentiation of cells can be observed in part C.
120. Cohesion of stamens is shown by which one of the following condition?
 a) Epiphyllous b) Didynamous c) Syngenesious d) Epipetalous
121. Phylloclade is found in
 a) Opuntia b) Cactus c) Acacia d) Both (1) & (2)
122. Assertion: Leaves of monocot plants generally possess reticulate venation
 Reason: Leaves of dicot plants generally possess parallel venation
- a)
 If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
 If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false. d) If both assertion and reason are false
123. Which of the following plants bears moniliform roots?
 a) Momordica b) Curcuma c) Dahlia d) Asparagus

124. In the given figure of maize grain certain regions are labelled as A, B, C and D.
Match them with the codes (1, 2, 3 and 4) given below and select the correct option.



- (1) The main nutritive tissue
(2) Shield shaped cotyledon
(3) Protection sheath of radicle
(4) The proteinaceous layer
- a) A-(1), B-(3), C-(4), D-(2) b) A-(2), B-(3), C-(1), D-(4)
c) A-(1), B-(2), C-(3), D-(4) d) A-(4), B-(2), C-(3), D-(1)
125. Given are some differences between an underground stem and a root. Select the option that identifies the incorrect pair of differences

Underground stem	Root
It is differentiated into nodes and internodes.	It is not differentiated into nodes and internodes.
Scale leaves are present at the nodes.	Scale leaves are absent in roots.
Axillary buds are present in the axil of scale leaves.	Axillary buds are present at root tips
Branches arise exogenously.	Branches arise endogenously.
Flowers and fruits are usually present.	Flowers and fruits are absent.
These usually perform the function of food storage.	These always perform the function of food storage.

- a) (A) - (ii), (B) - (iii), (C) - (i), (D) - (iv) b) (A) - (iii), (B) - (ii), (C) - (i), (D) - (iv)
c) (A) - (iv), (B) - (iii), (C) - (ii), (D) - (i) d) A - (i), (B) - (ii), (C) - (iv), (D) - (iii)
126. When the margins of sepals or petals overlap one another without any particular direction the condition is termed as:
a) Imbricate b) Twisted c) Valvate d) Vexillary
127. Which one of the following is a time fruit?
a) Apple b) Pear c) Cashewnut d) Coconut
128. In unilocular ovary with a single ovule the placentation is:
a) Axile b) Marginal c) Basal d) Free central

129. The primary growth in root is due to

- a) Zone of maturation b) Zone of cell division c) Zone of cell elongation
d) Meristematic region

130. Fruit of groundnut is _____ .

- a) Legume b) Caryopsis c) Berry d) Nut

131. Epipetalous and syngenesious stamens occur in _____ .

- a) Solanaceae b) Brassicaceae c) Fabaceae d) Asteraceae

132. What would be the number of chromosomes of the aleurone cells of a plant with 42 chromosomes in its root tip cells?

- a) 42 b) 63 c) 84 d) 21

133. Study the given figures and identify the kind of phyllotaxy.



a)

(i)	(ii)	(iii)
Whorled	Opposite	Alternate

b)

(i)	(ii)	(iii)
Alternate	Opposite	Whorled

c)

(i)	(ii)	(iii)
Opposite	Alternate	Whorled

d)

(i)	(ii)	(iii)
Opposite	Whorled	Alternate

134. Identify the group of plants possessing leaf tendrils:

- a) Pea, Glory lily b) Cucumber, Pumpkin c) Watermelon, Grapevine
d) All of these

135. Assertion: In some flowers like lily, perianth is a term used when calyx and corolla are not distinct.

Reason: Calyx and corolla are the reproductive organs

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

136. A perennial plant differs from biennial in _____ .

- a) Having underground perennating structure
b) Having asexual reproductive structures c) Being tree species
d) Not dying after seasonal production of flowers

137. Flower with radical symmetry is

a) Cassia b) Datura c) Pea d) Canna

138. Velamen is found in _____ .

a) Roots of screwpine b) Aerial and terrestrial roots of orchids
c) Leaves of Ficus elastica d) Aerial roots of orchids

139. Phyllode is present in:

a) Australian Acacia b) Opuntia c) Asparagus d) Euphorbia

140. Assertion : The alternate type of phyllotaxy is the arrangement of leaves in which a single leaf arises at each node in alternate manner

Reason: The alternate type of phyllotaxy is seen in China rose and mustard plant

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

141. When adventitious roots are shallow surface feeders then they are known as

a) Tuberous root b) Prop root c) Fibrous root d) Conial root

142. The drug 'Belladonna' is obtained from

a) Atropa b) Rauwolfia c) Solanum d) Capsicum

143. Juicy hair-like structures observed in the lemon fruit develop from

a) Exocarp b) Mesocarp c) Endocarp d) Mesocarp and endocarp

144. Match column I with column II and select the correct option from the given codes

Column I	Column II
(A) Vegetative buds	(i) Buds develop in axils of leaves
(B) Floral buds	(ii) Buds produce leafy shoots
(C) Axillary buds	(iii) Reproductive buds that produce flowers
(D) Accessory buds	(iv) Additional buds borne at leaf bases

a) (A) - (ii), (B) - (iii), (C) - (i), (D) - (iv) b) (A) - (iii), (B) - (ii), (C) - (i), (D) - (iv)

c) (A) - (iv), (B) - (iii), (C) - (ii), (D) - (i) d) (A) - (i), (B) - (ii), (C) - (iv), (D) - (iii)

145. Given figure represents a drupe of mango. Select the option that correctly identifies A, B, C and D.



a)

A	B	C	D
Pericarp	Epicarp	Mesocarp	Endocarp

b)

A	B	C	D
Epicarp	Mesocarp	Endocarp	Seed

c)

A	B	C	D
Mesocarp	Epicarp	Endocarp	Seed

d)

A	B	C	D
Epicarp	Mesocarp	Seed	Endocarp

146. Assertion: The outermost covering of a dicotyledonous seed is the seed coat

Reason : The seed coat has two layers-outer testa and inner hilum.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

147. Mango juice is got from _____.

a) Epicarp b) Mesocarp c) Endocarp d) Pericarp and thalamus

148. Epygynous flowers are present in

a) Mustard b) Brinjal c) China rose d) Cucumber

149. Assertion: G is the symbol for inferior ovary

Reason: Adhesion is indicated by enclosing the figure within bracket.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

150. Smilax and Gloriosa belong to

a) Liliaceae b) Solonaceae c) Leguminosae d) Cruciferae

151. X is a scar on the seed coat through which the developing seeds were attached to the fruit; above the X is a small pore called Y.

Identify X and Y and select the correct option.

a)

X	Y
Micropyle	Hilum

b)

X	Y
Hilum	Micropyle

c)

X	Y
Testa	Tegmen

d)

X	Y
Chalaza	Micropyle

152. Maize grain is a fruit known as

a) cypsela b) Caryopsis c) legume d) achene

153. Which of the following is false fruit?
a) Pome b) Pepo c) Hesperidium d) Drupe
154. Assertion: In some leguminous plants, the leaf base is swollen.
Reason: The swollen leaf base is called pulvinus.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
155. Diadelphous condition is common in
a) Malvaceae b) Cruciferae c) Liliaceae d) Fabaceae
156. Monothealous condition of stamens, i.e., presence of a single anther lobe is a characteristic of Family:
a) Cucurbitaceae b) Malvaceae c) Asteraceae d) Brassicaceae.
157. Which one of the following pairs is wrongly matched while the remaining three are correct?
a) Agave-Bulbils b) Grass-Runner c) Water hyacinth-Runner
d) Bryophyllum-Leaf buds
158. Leaf tip tendrils are present in
a) Smilax b) Lathyrus c) Pisum d) Gloriosa.
159. Rhizome of ginger is a modification of stem because
a) It bears Adventitious roots b) It bears nodes and internodes
c) It is underground d) It stores food material
160. Which of the following plant parts in garlic and onion are edible?
a) Underground stem b) Fleshy scale leaves c) Tunic d) Adventitious roots
161. The type of placentation present in Dianthus is also present in
a) Primrose b) Mustard c) China rose d) Marigold
162. Which of the following kinds of venation is present in banana?
a) Reticulate unicostate b) Reticulate multicostate c) Parallel unicostate
d) Parallel multicostate
163. Presence of tetradynamous condition and false septum i.e replum are the features of family
a) Solanaceae b) Brassicaceae c) Liliaceae d) Fabaceae
164. Angiosperm to which the largest flowers belong is _____.
a) Total stem parasite b) Partial stem parasite c) Total root parasite
d) Partial root parasite

165. The 'eyes' of the potato tuber represent:
 a) nodes b) root buds c) flower buds d) leaf buds.

166. Basal placentation occurs in
 a) Poaceae b) Solonaceae c) Malvaceae d) Liliaceae

167. Roots of which plant contains an oxidising agent?
 a) Carrot b) Soyabean c) Mustard d) Radish

168. Placentation in pea, bean is
 a) Axile b) Parietal c) Marginal d) Basal



Identify the given types of fruit and select the correct option.

a) A = Pepo, B = Nut b) A = Pepo, B = Drupe c) A = Balausta, B = Drupe
 d) A = Drupe, B = Pepo

170. Leaves become modified into spines in :
 a) Silk cotton b) Opuntia c) Pea d) Onion

171. The placenta is attached to the developing seed near the
 a) testa b) hilum c) micropyle d) chalaza.

172. Select the incorrect match with respect to the plant and the relative plant part modified for food storage
 a) Lathyrus odoratus (Sweet potato) - Root
 b) Solanum tuberosum (Potato) - Stem c) Allium cepa (Onion) - Leaves
 d) Dahlia (Dahlia) -Leaves

173. Match column I with column II and select the correct option from the given codes

column I	column-II
A Thorns	(i) Vegetative propagation
B Phylloclades	(ii) Defensive mechanism
C Runners	(iii) Mechanical support
D Stilt roots	(iv) Absorption of nutrition
E Haustoria	(v) Photosynthesis

a) A-(v), B-(iv), C-(iii), D-(ii), E-(i) b) A-(ii), B-(v), C-(iii), D-(i), E-(iv)
 c) A-(ii), B-(v), c-(i), D-(iii), E-(iv) d) A-(iii), B-(v), C-(iv), D-(i), E-(ii)

174. Coconut water from a tender coconut is _____ .

a) Free nuclear endosperm b) Innermost layers of the seed coat
 c) Degenerated nucellus d) Immature embryo

175. Which one of the following organisms is correctly matched with its three characteristics?

- a) Pea: C_3 pathway, Endospermic seed, vexillary aestivation
 b) Tomato: Twisted aestivation, Axile placentation, Berry
 c) Onion: Bulb, Imbricate aestivation, Axile placentation
 d) Maize: C_3 pathway, Closed vascular bundles, Scutellum

176. Most advanced type of placentation is

- a) Marginal b) Axile c) Basal d) Parietal

177. Match the following

(a) Parietal	(i) Dianthus
(b) Axile	(ii) Sunflower
(c) Free central	(iii) Mustard
(d) Basal	(iv) China rose

- a) a (iii), b (iv), c (ii), d (i) b) a (iii), b (iv), c (i), d (ii) c) a (i), b (ii), c (iii), d (iv)
 d) a (i), b (ii), c (iv), d (iii)

178. Following table summarises the comparisons between phylloclades and cladodes (cladophylls).

	Phylloclade	Cladode
(i)	Both main stem and branches are modified to function like leaves	Only the branches are modified to take over the function of leaves
(ii)	Phylloclade has limited or definite growth	Cladode has unlimited or indefinite growth
(iii)	It consists of several nodes and internodes	It is usually one internode long
(iv)	True leaves are commonly caducous	True leaves are either reduced to scales or modified to spines
(v)	Examples: Ruscus aculeatus, Asparagus, etc	Examples: Opuntia, Euphorbia, royleana, etc.

Pick up the wrong differences and select the correct option

- a) (i) and (ii) b) (ii) and (v) c) (iii) and (v) d) (ii) and (iv)

179. Which one of the following fruits is parthenocarpic?

- a) Banana b) Brinjal c) Apple d) Jackfruit

180. Which of the following is not an example of corm?

- a) Colocasia b) Freesia c) Crocus d) Zingiber

181. Geocarpic fruit is

- a) Carrot b) Radish c) Ground nut d) Turnip

182. Replum is

- a) False placenta b) False septum c) False ovule d) False thalamus

183. Heterospory and seed habit are often discussed in relation to a structure called

- a) Spathe b) Bract c) Petiole d) Ligule

184. Tricarpellary syncarpous gynoecium is found in flowers of:

- a) Liliaceae b) Solonaceae c) Fabaceae d) Poaceae

185. Assertion: Monoadelphous stamens are found in pea

Reason: In pea, stamens are united into one bunch or one bundle.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

186. Match column I with column II and select the correct option from the given codes

Column-I		Column-II
A Pedicel	(i)	Reduced leaf
B Peduncle	(ii)	Stalk of the flower
C Bract	(iii)	Stalk of the leaf
D Petiole	(iv)	Inflorescence axis

a) A-(ii), B-(iv), C-(i), D-(iii) b) A-(iii), B-(iv), C-(i), D-(ii)

c) A-(iii), B-(ii), C-(i), D-(iv) d) A-(ii), B-(iii), C-(i), D-(iv)

187. Match column I with column II and select the correct option from the given codes.

Column-I (Members of Fabaceae)		Column II (Economic importance)
A Gram, sem, moong, soybean	(i)	Timber
B Soybean, groundnut	(ii)	Medicine
C Indigofera	(iii)	Fodder
D Sunhemp	(iv)	Fibres
E Sesbania, Trifolium	(v)	Dye
F Dalbergia sissoo	(vi)	Edible oil
G Glycyrrhiza glabra	(vii)	Pulses

a) A-(i), B-(ii), C-(iii), D-(iv), E-(v), F-(vi), G-(vii)

b) A-(vii), B-(vi), C-(v), D-(iv), E-(iii), F-(i), G-(ii)

c) A-(ii), B-(iv), C-(vi), D-(i), E-(iii), F-(v), G-(vii)

d) A-(i), B-(iii), C-(v), D-(vii), E-(ii), F-(iv), G-(vi)

188. Match Column - I with Column - II and select the correct option using the codes given below

	Column - I		Column - II
a.	Pistills fused together	(i)	Gametonesis
b.	Formation of gametes	(ii)	Pistillate
c.	Hyphae of higher Ascomycetes	(iii)	Syncarpous
d.	Unisexual female flower	(iv)	Dikaryotic

a)	b)	c)	d)																																
<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iv)</td><td>(ii)</td><td>(i)</td><td>(ii)</td></tr></table>	A	B	C	D	(iv)	(ii)	(i)	(ii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(ii)</td><td>(i)</td><td>(iv)</td><td>(iii)</td></tr></table>	A	B	C	D	(ii)	(i)	(iv)	(iii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(i)</td><td>(ii)</td><td>(iv)</td><td>(iii)</td></tr></table>	A	B	C	D	(i)	(ii)	(iv)	(iii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iii)</td><td>(i)</td><td>(iv)</td><td>(ii)</td></tr></table>	A	B	C	D	(iii)	(i)	(iv)	(ii)
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(ii)	(i)	(iv)	(iii)																																
A	B	C	D																																
(i)	(ii)	(iv)	(iii)																																
A	B	C	D																																
(iii)	(i)	(iv)	(ii)																																

189. Placenta swollen with many ovules is present in family
a) Solanaceae b) Brassicaceae c) Lillaceae d) Malvaceae

190. With respect to the given figure, select the correct option.



- a) It possesses one or more nodes.
b) It grows aurally for some distance and finally touches the ground.
c) It is present in *Fragaria*, *Jasminum*, etc. d) All of these
191. Caryopsis fruit is found in
a) wheat b) Pea c) Gram d) Lentil
192. Which one of the following statements is correct ?
a) Flower of tulip is a modified shoot b) In tomato, fruit is a capsule
c) Seeds of orchids have oil-rich endosperm d) Placentation in Primrose is basal
193. Consider the following statements.
(i) In Gynandropsis, *Passiflora*, etc., thalamus is elongated and shows well developed nodes and internodes
(ii) The floral buds in *Agave*, *Allium*, etc., may sometimes get modified into vegetative buds or bulbils.
(iii) Sepals are concerned with protection of flowers in bud condition and petals help to attract insects for pollination.
(iv) Stamens and carpels serve as the male and female reproductive organs respectively.
- Which of the following combinations of above statements provides an evidence that flower is a modified shoot?
- a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (i) and (iv)
194. Floral formula of tomato/tobacco is _____ .

- a) $\oplus \overline{Q}^{\pi} K_{4-5} A_{10} G_{(2)}$ b) $\oplus O^{\lambda} K_{2+2} C_4 A_{2+4} G_1$ c) $\oplus \hat{q}^{\lambda} P_2 A_3 G_1$
 d) $Br \oplus \overline{q}^{\pi} K_{(5)} C_{(5)} A_{(5)} G_{(2)}$

195. The floral formula $\oplus \overline{\sigma} K_{(5)} \overline{C}_{(5)} A_5 \underline{G}_{(2)}$ belongs to the Family

- a) Fabaceae b) Asteraceae c) Solanaceae d) Liliaceae.
 196. Bicarpellary gynoecium and oblique ovary occurs in _____.
 a) Mustard b) Banana c) Pisum d) Brinjal
 197. Identify the types of inflorescence shown in the figure and select the correct option for A and B.



a)

A	B
Cymose	Racemose

b)

A	B
Racemose	Cymose

c)

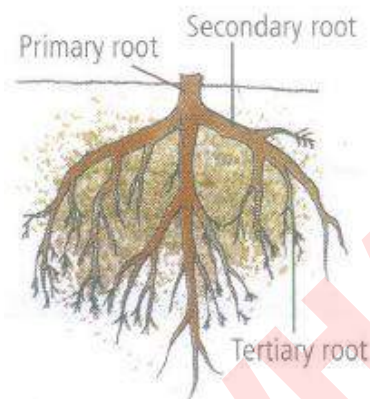
A	B
Racemose	Racemose

d)

A	B
Cymose	Cymos

198. Hypanthodium is _____.
 a) Thalamus b) Fruit c) Inflorescence d) Ovary
 199. Assertion: Fibrous root system consists of large number of fine, fibrous roots developing from the base of the stem
 Reason: Fibrous root system is found in dicots only
 a)
 If both assertion and reason are true and reason is the correct explanation of assertion.
 b)
 If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false. d) If both assertion and reason are false
 200. Placentation of mustard plant is
 a) Parietal b) Axial c) Basal d) Marginal
 201. In a floral formula, actinomorphic nature of flower is represented by
 a) A b) / c) % d) \oplus
 202. Parkinsonia is a good example of
 a) phylloclade b) parachute mechanism c) phyllode d) winged fruits.
 203. Biological name of wheat is
 a) Triticum aestivum b) Triticum tritcale c) Triticum sativum
 d) Triticum sativum
 204. Arrangement of flower on floral axis is termed as

- a) Phyllotaxy b) Venation c) inflorescence d) inflorescence
205. Rearrange the following zones as seen in the root in vertical section and choose the correct option
A. Root hair zone
B. Zone of meristems
C. Root cap zone
D. Zone of maturation
E. Zone of elongation
a) C, B, E, A, D b) A, B, C, D, E c) D, E, A, C, B d) E, D, C, B, A
206. The most advanced type of Inflorescence is
a) Corymb b) Capitulum c) Spadix d) Catkin
207. Spathe is present in the flowers of
a) Banana b) Rice c) Marigold d) Sunflower
208. Refer to the given figure and select the incorrect statement regarding this.



- a) Lateral roots arising from the main root are exogenous in origin.
b) Rootlets are the ultimate root branches that bear root hair for absorption.
c) Secondary and tertiary roots are borne in acropetal succession.
d) This type of root system develops from radicle of embryo.
209. In cyathium the ratio between female to male flower is
a) One:One b) One:Many c) Many:One d) Many:Many
210. Cotyledon of maize grain is called:
a) Scutellum b) Plumule c) Coleorhiza d) Coleoptile
211. Assertion : Stems of some plants protect them from browsing animals
Reason : Axillary buds of stems of these plants are modified into thorns
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false

212. Pulses are obtained from _____.
a) Fabaceae b) Asteraceae c) Poaceae d) Solanaceae
213. Select the mismatched pair
a) Taproot system - Dicots b) Fibrous root system - Monocots
c) Fasciculated roots - Curcuma d) Stilt roots - Sugarcane
214. Ray florets have:
a) Hypogynous ovary b) Half inferior ovary c) Inferior ovary d) Superior ovary
215. Placenta and pericarp are both edible portions in:
a) Apple b) Banana c) Tomato d) potato
216. Match the column I to column II
- | Column I | Column II |
|----------------|---------------------------|
| (A) Mango | (i) Cotyledons & peduncle |
| (B) Strawberry | (ii) Mesocarp |
| (C) Cashew nut | (iii) Endosperm |
| (D) Coconut | (iv) Thalamus |
- a) A- ii, B- iv, C-i, D-iii b) A-ii, B-i, C-iii, D-iv c) A-i, B-ii, C-iii, D-iv
d) A-iv, B-iii, C-ii, D-i
217. The mature seeds of plants such as gram and peas, possess no endosperm, because
a) these plants are not angiosperms b) there is no double fertilisation in them
c) endosperm is not formed in them
d) endosperm gets used up by the developing embryo during seed development
218. The wheat grain has an embryo with one, large, shield-shaped cotyledon known as:
a) Coleorrhiza b) Scutellum c) Coleoptile d) Epiblast
219. In a cereal grain the single cotyledon of embryo is represented by _____.
a) scutellum b) prophyll c) coleoptile d) coleorrhiza
220. Which of the following is a flowering plant with nodules containing filamentous nitrogen-fixing micro-organism _____.
a) Crotalaria juncea b) Cycas revoluta c) Cicer arietinum
d) Casuarina equisetifolia
221. Marginal Placentation and diadelphous condition are found in the family
a) Fabaceae b) Brassicaceae c) Liliaceae d) Solanaceae
222. In Opuntia, the function of photosynthesis is carried out by
a) cladode b) phyllode c) phylloclade d) stipules.
223. Siliqua is the fruit of
a) Cruciferae b) Malvaceae c) Liliaceae d) Solonaceae
224. Coconut fruit is a:
a) Berry b) Nut c) Capsule d) Drupe

225. Find the odd one w.r.t stem tendrils

- a) Grapevines b) Cucumber c) Pea d) Pumpkin

226. Flowers are unisexual in :

- a) Onion b) Pea c) Cucumber d) China rose

227. Roots are modified to perform specific functions other than their normal functions.

The given figure shows modification of the roots of mangrove plant. Select the incorrect option regarding it.



a) The stilt roots of red mangrove help in breathing.

b) The root system is highly entangled, huge and extensive under the water

c)

A large number of animals such as small fishes, crustaceans, sea horses, etc., find shelter in this root system.

d)

Besides providing mechanical support, these roots also perform photosynthetic functions in the plant.

228. Match the followings and choose correct option.

Group-I		Group-II
A Aleurone layer	(i)	Without fertilisation
B Parthenocarpic fruit	(ii)	Nutrition
C Ovule	(iii)	Double fertilisation
D Endosperm	(iv)	Seed

a) A-(i), B-(ii), (-)(iii), D-(iv) b) A-(ii), B-(i), (-)(iv), D-(iii) c) A-(iv), B-(ii), (-)(i), D-(iii)

d) A-(ii), B-(iv), (-)(i), D-(iii)

229. Identify the missing words (A, B, C and D) and select the correct option.

Family	Inflorescence	Flower	Stamens/tepals	Gynoecium
Fabaceae	A	B	C	D
Solanaceae	Solitary, axillary or cymose	Actinomorphic	5	Bicarpellary
Liliaceae	Solitary, cymose or racemose	Actinomorphic	C	Tricarpellary

a)

A	B	C	D
Racemose	Zygomorphic	3 + 3	Monocarpellary

b)

A	B	C	D
Racemose	Actinomorphic	5	Bicarpellary

c)

A	B	C	D
Cymose	Zygomorphic	3+3	Tricarpellary

d)

A	B	C	D
Cymose	Actinomorphic	5	Multicarpellary

230. How many plants among Indigofera, Sesbania, Salvia, Allium, Aloe, mustard, groundnut, radish, gram and turnip have stamens with different lengths in their flowers?

a) Three b) Four c) Five d) Six

231. Androecium of pea is

a) Monoadelphous b) Diadelphous c) Polyadelphous d) Epiphyllous

232. Plant having column of vascular tissues, bearing fruits and having a tap root system is _____.

a) Monocot b) Dicot c) Gymnosperm or dicot d) Gymnosperm or monocot

233. Match column I with column II and select the correct option from the given codes

Column-I		Column-II
A Marginal	(i)	Sunflower, marigold
B Parietal	(ii)	Pea
C Axile	(iii)	Mustard, Argemone
D Free central	(iv)	Hibiscus, tomato, lemon
E Basal	(v)	Dianthus, Primrose

a) A-(ii), B-(iii), C-(iv), D-(v), E-(i) b) A-(i), B-(iii), C-(ii), D-(v), E-(iv)

c) A-(i), B-(ii), C-(iii), D-(iv), E-(v) d) A-(iii), B-(ii), C-(iv), D-(v), E-(i)

234. Fruit of brinjal is

a) Berry b) Hesperidium c) Drupe d) Pome

235. What is eye of potato?

a) Axillary bud b) Accessory bud c) Adventitious bud d) Apical bud

236. A family delimited by type of inflorescence is _____.

a) Fabaceae b) Asteraceae c) Solanaceae d) Liliaceae

237. _____ are the green stems of limited growth which have taken over the function of photosynthesis from leaves

a) Phylloclades b) Cladodes c) Phyllodes d) Stem thorns

238. Floral features are chiefly used in angiosperms identification because _____.

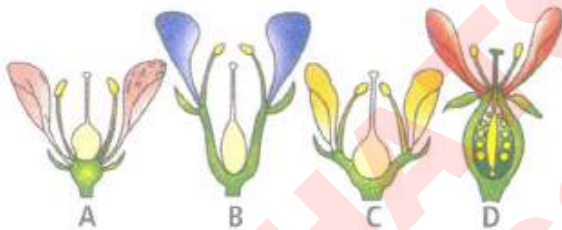
- a) Flowers are of various colours b) Flowers can be safely pressed
c) Reproductive parts are more stable and conservative than vegetative parts
d) Flowers are nice to work with
239. In which of the following family, perianth and trimerous flowers are found
a) Malvaceae b) Crucifereae c) Liliaceae d) Papilionaceae
240. Read the following statements and select the correct option.
Statement 1: The stem tubers are the swollen ends of specialised underground stem branches, which help in vegetative propagation of the plant
Statement 2: Solanum tuberosum is an example of a stem tuber which stores inulin as the main reserve food material.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d)
Ficus benghalensis, Pisstem tuber is an oval or spherical underground swollen stem structure which does not bear adventitious roots, e.g., potato (Solanum tuberosum), Jerusalem artichoke (Helianthus tuberosus). Food reserve is starch in potato and inulin in artichokeum sativum
241. Endospermic seeds are found in
a) barley b) castor c) pea d) both (a) and (b).
242. An example of edible underground stem is :
a) Carrot b) Groundnut c) Sweet potato d) Potato
243. In som _____ the leaf base may become swollen and is called as _____
a) monocots, sheathing leaf base b) legumes, pulvinus
c) legumes, sheathing leaf base d) monocots, pulvinus
244. Botanical name of cauliflower is _____.
a) Brassica oleracea var. capitata b) Brassica campestris
c) Brassica oleracea var. botrytis d) Brassica oleracea var. gemmifera
245. Polyadelphous stamens are found in
a) Cotton b) China rose c) Pea d) Lemon
246. Which plant part is modified into pitcher in pitcher plants?
a) Root b) Stem c) Leaf d) Flower
247. Butterfly shaped corolla is called
a) Campanulate b) Rotate c) Papilionaceous d) All
248. A modification of petiole is
a) Phyllode b) Phylloclade c) Cladode d) Corm
249. In Dianthus, placentation is

- a) Basal b) Free central c) Axile d) Marginal
250. Venation is a term used to describe the pattern of arrangement of
a) floral organs b) flower in inflorescence c) veins and veinlets in a lamina
d) all of them
251. Buttress roots are found in _____.
a) Sorghum b) Banyan c) Terminalia d) Pandanus
252. The technical term used for the androecium in a flower of China rose (*Hibiscus rosa-sinensis*) is :
a) Polyadelphous b) Monadelphous c) Diadelphous d) Polyandrous
253. aestivation in the corolla of *Pisum sativum* is
a) Imbricate b) vexillary c) quincuncial d) valvate
254. Endosperm, a product of double fertilisation in angiosperms is absent in the seeds of
a) coconut b) orchids c) maize d) castor.
255. Sweet potato is homologous to
a) Turnip b) Potato c) Colocasia d) Ginger
256. Cereals, castor and coconut possess _____ seeds
a) endospermic b) zoospermic c) non-albuminous d) none of these
257. Which one of the following is a xerophytic plant in which the stem is modified into a flat, green and succulent structure?
a) Casuarina b) Hydrilla c) Acacia d) Opuntia
258. Which one of the following is exalbuminous seed?
a) Wheat seed b) Maize seed c) Castor seed d) Pea seed
259. The embryo in sunflower has _____.
a) One cotyledon b) Two cotyledons c) Many cotyledons d) No cotyledon
260. In spiral phyllotaxy, the number of leaves at each node is
a) one b) two c) three d) many.
261. Which plant will lose its economic value if its fruits are produced by induced parthenocarpy?
a) Grape b) Pomegranate c) Banana d) Orange
262. *Colchicum autumnale* belongs to
a) Leguminosae b) Cruciferae c) Liliaceae d) Malvaceae

263. Which of the following features characterise the family represented by the given floral diagram?



- a) Cruciform corolla with quincuncial aestivation
 - b) Stamens with didynamous condition
 - c) Bicarpellary, syncarpous ovary with parietal placentation
 - d) Inflorescence usually cymose
264. Based on the position of floral parts on thalamus, the flowers, are described as hypogynous, perigynous and epigynous. Which of the following floral forms (A-D) represent the flowers of Rosa and Prunus respectively?



- a) A and B b) B and C c) C and D d) B and D
265. Which of the following is an incorrect pair?
- a) Phylloclade - Opuntia b) Cladode - Ruscus c) Phyllode - Asparagus
 - d) Stem tendrils - Grapevine
266. Stems modified into flat green organs performing the functions of leaves are known as:
- a) Scales b) Cladodes c) Phyllodes d) Phylloclades
267. Which of the following floral formulae corresponds to Family Liliaceae?
- (A)

$$\text{Br} \oplus \text{P}_{3+3} \text{A}_{3+3} \overline{\text{G}}_{(3)}$$

(B)

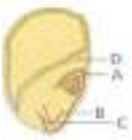
$$\text{Br} \oplus \text{P}_{3+3} \text{A}_0 \underline{\text{G}}_{(3)}$$

(C)

$$\text{Br} \oplus \text{P}_3 \text{A}_3 \underline{\text{G}}_{(3)}$$
- (D)

$$\text{Br} \oplus \text{P}_{(3+3)} \text{A}_{3+3} \underline{\text{G}}_{(3)}$$
268. Vexillary aestivation is characteristic of the family _____.
- a) Fabaceae b) Asteraoeae c) Solanaceae d) Brassicaceae
269. An aggregate fruit is the one which develops from:

- a) Multicarpellary, apocarpous gynoecium b) Complete inflorescence
c) Multicarpellary, superior ovary d) Multicarpellary, syncarpous gynoecium
270. Tetradynamous stamens and cruciform corolla are characteristic features of
a) *Solanum tuberosum* (Potato) b) *Abelmoscus esculentus* (Lady finger)
c) *Ochroma lagopus* (Balsa) d) *Brassica campestris* (Mustard)
271. 'Simla mirch' chillies and potato belongs to family
a) Solonaceae b) Compositae c) Gramineae d) Cruciferae
272. Which floral family has (9) + 1 arrangement of anthers in the androecium?
a) Malvaceae b) Rutaceae c) Fabaceae d) Caesalpinaceae
273. Read the given statements.
(i) Gynoecium occupies the highest position while the other floral parts are situated below it.
(ii) Ovary is superior.
(iii) Examples are Brassica, Hibiscus, brinjal, etc.
Which condition of flowers is being described by the above statements?
a) Hypogyny b) Perigyny c) Epigyny d) None of these
274. Catkin inflorescence is found in
a) Wheat b) Oat c) Mulberry d) Fig
275. Given figure represents longitudinal section of a monocotyledonous embryo. Identify the parts labelled as A, B, C and D from the list (i-vii) and select the correct option.
(i) Scutellum
(ii) Coleoptile
(iii) Shoot apex
(iv) Epiblast
(v) Radicle
(vi) Root cap
(vii) Coleorhiza



- a)

A	B	C	D
(i)	(vi)	(vii)	(ii)
- b)

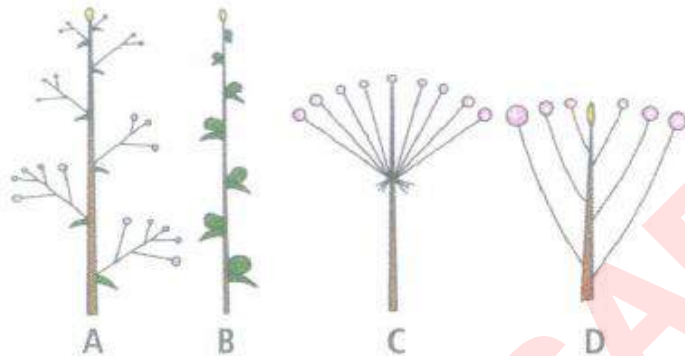
A	B	C	D
(ii)	(vii)	(v)	(i)
- c)

A	B	C	D
(iv)	(iii)	(vi)	(vii)
- d)

A	B	C	D
(iii)	(vii)	(vi)	(ii)

276. In Bougainvillea, weak stems rise up a support by clinging to it with the help of curved thorns, such plants are called as
a) tendrils b) hooks c) offsets d) scramblers.
277. Vegetative reproduction of Agave occurs through _____.
a) Rhizome b) Stolon c) Bulbils d) Sucker

278. Zygomorphic flower occurs in
 a) Pea b) Gulmohur c) Cassia d) All of these
279. Which of the following is not stem modification:
 a) Flattened structures of Opuntia b) Pitcher of Nepenthes c) Thorns of Citrus
 d) Tendrils of cucumber
280. Vegetative propagation in Pistia occurs by :
 a) Stolon b) Offset c) Runner d) Sucker
281. The given figure shows some types of inflorescences. Select the option that correctly identifies them.



a)

A	B	C	D
Panicle	Spike	Corymb	Catkin

b)

A	B	C	D
Spike	Panicle	Corymb	Catkin

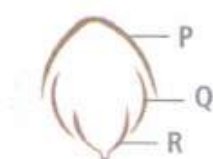
c)

A	B	C	D
Panicle	Catkin	Umbel	Spike

d)

A	B	C	D
Panicle	Spike	Umbel	Corymb

282. In which of the families the stamens are in two whorls and epiphyllous
 a) Malvaceae b) Malvaceae c) Liliaceae d) Caesalpinoideae
283. Bicarpellary ovary with parietal placentation and false septum is found in
 a) Cruciferae b) Leguminosae c) Malvaceae d) Compositae
284. Botanical name of pea plant is
 a) Pisum sativum b) Pinus sativus c) Pyrus sativus d) Pisum sativus
285. The morphological nature of the edible part of coconut is:
 a) Cotyledon b) Endosperm c) Pericarp d) Perisperm
286. The given figure represents vexillary aestivation. Select the suitable labels for P, Q, and R.



a)

P	Q	R
Standard	Wing	Ala

b)

P	Q	R
Standard	Keel	Wing

c)

P	Q	R
Wing	Keel	Carina

d)

P	Q	R
Standard	Ala	Carina

287. Assertion: Avicennia has pneumatophores.

Reason : Pneumatophores help the plant to get oxygen for respiration

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

288. Allium cepa (onion) belongs to the family

a) Solonaceae b) Liliaceae c) Cruciferae d) Compositae

289. Assertion: Fruit is the mature or ripened ovary developed after fertilisation

Reason: Fruit formed without fertilisation of the ovary is called parthenocarpic fruit.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

290. Assertion : The floral formula of Family Solanaceae is



Reason : This floral formula of Solanaceae tells that flower is bisexual, sepals five, petals five, stamens five and gynoecium tricarpeal, trilocular with many ovules.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false

291. Identify the type of modified root and select the correct statement regarding it.



- a) It is the tuberous root of Dahlia that stores inulin as reserve food.
- b) It is a modified taproot that occurs in Dahlia.
- c) It is a modified adventitious root that stores reserve food material.
- d) These roots are modified to provide mechanical support to the plant.

292. Match column I with column II and select the correct option from the given codes.

Column I (Type of fleshy taproot)	Column II (Example)
A Conical	(i) Brassica rapa
B Fusiform	(ii) Daucus carota
C Napiform	(iii) Raphanus sativus
D Tuberous	(iv) Mirabilis jalapa

- a) A-(ii), B-(iii), C-(i), D-(iv)
- b) A-(iii), B-(ii), C-(i), D-(iv)
- c) A-(ii), B-(i), C-(iii), D-(iv)
- d) A-(ii), B-(iii), C-(iv), D-(i)

293. Identify the different types of placentation shown in figure and select the correct option.



a)

A	B	C	D	E
Axile	Marginal	Free central	Parietal	Basal

b)

A	B	C	D	E
Marginal	Basal	Axile	Free central	Parietal

c)

A	B	C	D	E
Marginal	Axile	Parietal	Free central	Basal

d)

A	B	C	D	E
Marginal	Parietal	Axile	Basal	Free centra

294. Roots associated with nitrogen fixing bacteria are

- a) Fusiform roots
- b) Napiform roots
- c) Nodulated roots
- d) Conical roots

295. How many plants in the list given below have marginal placentation?

Mustard, Gram, Tulip, Asparagus, Arhar, Tobacco Sunhemp, Chilli, Colchicine, Onion, Moong, Pea, Lupin.

- a) Four b) Five c) Six d) Three
296. Persistent calyx is the character of plants belonging to Family
a) Solanaceae b) Malvaceae c) Cruciferae (Brassicaceae) d) Compositae.
297. Coleorhiza and coleoptile are the protective sheaths covering _____ and _____ respectively
a) radicle, plumule b) plumule, radicle c) plumule, hypocotyl d) epicotyl, radicle
298. New banana plants develop from _____.
a) Rhizome b) Sucker c) Stolon d) Seed
299. Inferior ovary is present in
a) Hypogynous flower b) Perigynous flower c) Dichogamous flower
d) Epigynous flower
300. Assertion: The cymose type of inflorescence has limited growth.
Reason: In cymose inflorescence the main axis terminates in a flower
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
301. _____ are one internode long runners, usually found in rosette plants at the ground/water level.
a) Trailers b) Offsets c) Stolons d) Rhizomes
302. Which is correct pair for edible part?
a) Tomato - Thalamus b) Maize - Cotyledons c) Guava - mesocarp
d) Date palm - Mesocarp
303. Non-albuminous seed is produced in:
a) Maize b) Castor c) Wheat d) Pea
304. Flowers are zygomorphic in:
a) Mustard b) Gulmohur c) Tomato d) Datura
305. In _____ placentation, a monocarpellary ovary bears a single longitudinal ovule along the junction of two fused margins
a) axile b) parietal c) free central d) marginal

306. Study carefully the given floral diagram and select the option which correctly represents the related floral formula.



- (A) a) $\oplus \text{P}_{(3+3)} \text{A}_{3+3} \underline{\text{G}}_{(3)}$ (B) b) $\oplus \text{P}_6 \text{A}_6 \underline{\text{G}}_{(3)}$ (C) c) $\oplus \text{P}_{5+5} \text{A}_{(5)} \underline{\text{G}}_{(2)}$
- (D) d) $\oplus \text{K}_{(5)} \text{C}_{(5)} \text{A}_{(5)} \underline{\text{G}}_{(2)}$

307. *Atropa belladonna*, an important medicinal plant is of the family

- a) Liliaceae b) Cucurbitaceae c) Cruciferae d) Solonaceae

308. A dicot plant showing parallel venation is

- a) Smilax b) Calophyllum c) Cotton d) Mango

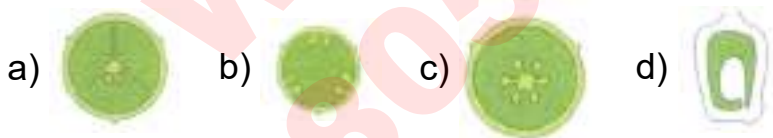
309. Reticulate venation is a characteristic of dicots. An exception to this generalisation is

- a) Calophyllum b) Ficus c) Hibiscus d) Zizyphus.

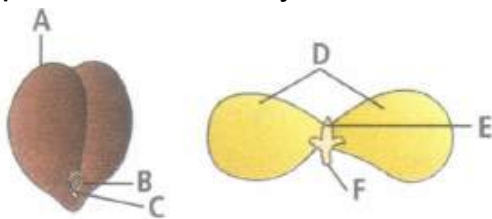
310. Edible part in pomegranate is

- a) Testa b) Epicarp c) Endocarp d) Epidermis

311. Which of the following figures represents a typical placentation as seen in *Hibiscus rosa sinensis* (China rose)?



312. Refer to the given figures showing structure of dicotyledonous seed and select the option that correctly identifies any of the labelled parts.



- a) A-Seed coat, B-Cotyledon, C-Plumule b) D-Micropyle, E-Hilum, F-Radicle
c) B-Hilum, E-Plumule, F-Radicle d) C-Cotyledon, D-Micropyle, E-Radicle

313. If the filaments are fused in a single group the condition is

- a) Monadelphous b) Polyadelphous c) Both 1 & 2 d) Diadelphous

314. Radial symmetry is found in the flowers of :

- a) Cassia b) Brassica c) Trifolium d) Pisum

315. Ground nut belongs to family
a) Fabaceae b) Malvaceae c) Liliaceae d) Cucurbitaceae
316. In Ruscus, the modification is
a) Phyllode b) Cladode c) Offset d) Sucker
317. Fruit legume is characteristic feature of
a) Solonaceae b) Liliaceae c) Fabaceae d) Fabaceae
318. Which is an example of offset?
a) Cynodon dactylon b) Eichhornia c) Fragaria d) Mentha
319. In ginger vegetative propagation occurs through
a) Offsets b) bulbils c) Runners d) Rhizome
320. Find out the incorrect match.
a) Sterile stamen - Staminode b) Stamens attached to petals - Epipetalous
c) Stamens attached to perianth - Episepalous d) Free stamens - Polyandrous
321. Read the given statements and select the correct ones.
(i) Root caps are present in prop roots.
(ii) Pneumatophores help to get oxygen for respiration
(iii) Edible part of ginger is underground stem
(iv) Hydrophytes usually possess a well developed root system
a) (i) and (ii) only b) (ii) and (iii) only
c)
Hydrophytes are plants adapted for growing in water. In hydrophytes, roots are of secondary importance so they are poorly developed.
d) (i), (ii), (iii) and (iv)
322. The ovary is half inferior in :
a) Sunflower b) Plum c) Brinjal d) Mustard
323. Find correct match
- | | Column - I | | Column - II |
|----|------------|-------|-------------|
| a. | Bulb | (i) | Potato |
| b. | Rhizome | (ii) | Jasmine |
| c. | Stolon | (iii) | Ginger |
| d. | Tuber | (iv) | Allium |
- a) a(i), b(iii), c(ii), d(iv) b) a(iv), b(iii), c(ii), d(i) c) a(iv), b(iii), c(i), d(ii)
d) a(iii), b(iv), c(ii), d(i)
324. Select the incorrect pair out of the following
a) Monadelphous - Hibiscus b) Diadelphous - Cucurbita
c) Polyadelphous - Citrus d) Syngenesious - Helianthus
325. The ornamental leguminous plant is
a) Tulip b) Petunia c) Sesbania d) Lupin

326. Nodulated roots occurs in

- a) Liliaceae b) Solonaceae c) Malvaceae d) Fabaceae

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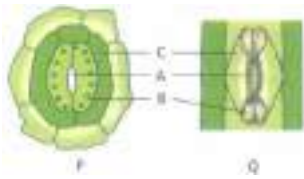
Time : 1 Mins
ANATOMY OF FLOWERING PLANTS 1
Marks : 1244

1. Death of protoplasm is a prerequisite for a vital function like _____.
 a) Transport of sap b) Transport of food c) Absorption of water
 d) Gaseous exchange
2. Function of collenchyma is
 a) Photosynthesis b) Mechanical support c) Both d) Secretion
3. When a tree grows older which of the following increased rapidly
 a) Heart wood b) Sap wood c) Pith d) Cortex
4. Plants having little or no secondary growth are:
 a) Conifers b) Deciduous angiosperms c) Grasses d) Cycads
5. The apical meristem of the root is present _____.
 a) In all the roots b) Only in radicals c) Only in tap roots
 d) Only in adventitious roots
6. Which exposed wood will decay faster?
 a) Sapwood b) Softwood c) Wood with lot of fibres d) Heartwood
7. Thickenings in collenchyma is mainly due to deposition of-
 a) Cellulose b) Pectin c) Lignin d) suberin
8. Read the following statements and select the correct ones.
 (i) Phloem parenchyma is absent in most monocots.
 (ii) Gymnosperms lack tracheids and vessels.
 (iii) Gymnosperms lack companion cells
 a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)
9. Match the following and choose the correct option from below.

A.	Cuticle	(i)	Guard cells
B.	Bulliform cells	(ii)	Single layer
C.	Stomata	(iii)	Waxy layer
D.	Epidermis	(iv)	Empty colourless cell

- a) A-(iii), B-(iv), (-i), D-(ii) b) A-(i), B-(ii), (-iii), D-(iv)
c) A-(iii), B-(ii), (-iv), D-(i) d) A-(iii), B-(ii), (-i), D-(iv)
10. A plant tissue, when stained, showed the presence of hemicellulose and pectin in cell wall of its cells. The tissue represents
a) collenchyma b) sclerenchyma c) xylem d) meristem.
11. Outer part of bark is
a) Epidermis b) Rytidome c) Phelloderm d) Lenticel
12. In endarch condition of xylem, protoxylem lies _____ of metaxylem.
a) on inner side b) on outer side c) both on inner and outer side
d) in centre
13. Bicollateral vascular bundles are found in
a) Helianthus b) Zea mays c) Cucurbita d) Dracaena.
14. Which of the following is a vessel-less angiosperm?
a) Tetracentron b) Trochodendron c) Wintera d) All of these
15. Vesselless angiosperms include
a) Tetracentraceae b) Trochodendraceae c) Winteraceae d) All of these
16. Casparian strips occur in:
a) Cortex b) Pericycle c) pidermis d) Endodermis
17. A narrow layer of thin walled cells found between phloem/bark and wood of a dicot is _____.
a) Cork cambium b) Vascular cambium c) Endodermis d) Pericycle
18. Which one of the following is wrongly matched?
a) Root pressure - Guttation b) Puccinia - Smut c) Root- Exarch protoxylem
d) Cassia Imbricate aestivation
19. Centripetal and centrifugal xylem are the important feature of
a) Root and stem xylem respectively
b) Exarch and endarch xylem respectively
c) Endarch and exarch xylem respectively d) Both (1) & (2)
20. What is not true about sclereids?
a) These are parenchyma cells with thickened lignified walls
b) These are elongated and flexible with tapered ends
c)
These are commonly found in the shells of nuts and in the pulp of guava, pear, etc
d) These are also called the stone cells

21. In old trees, central dark coloured, non-conducting part of secondary xylem is referred to as
a) heartwood b) sapwood c) softwood d) hardwood.
22. Given figures (P and Q) represent the stomatal apparatus of dicot and monocot leaves respectively. Select the option which correctly labels A, B and C.



- a)
- | A | B | C |
|-------|------------------|-------------|
| Stoma | Subsidiary cells | Guard cells |
- b)
- | A | B | C |
|-------|------------------|-----------------|
| Stoma | Subsidiary cells | Epidermal cells |
- c)
- | A | B | C |
|-------------|-------|-------------|
| Guard cells | Stoma | Chloroplast |
- d)
- | A | B | C |
|-------|-------------|------------------|
| Stoma | Guard cells | Subsidiary cells |

23. Hypodermis is _____ in sunflower stem and _____ in maize stem.
a) parenchymatous, collenchymatous b) collenchymatous, sclerenchymatous
c) sclerenchymatous, collenchymatous d) sclerenchymatous, parenchymatous
24. An example of monocots showing secondary growth in stem is
a) Lilium b) Pea c) Asparagus d) Yucca
25. In (i) protoxylem lies towards periphery and metaxylem lies towards centre. Such an arrangement of primary xylem is called as (ii).
a)
- | (i) | (ii) |
|-------|---------|
| stems | endarch |
- b)
- | (i) | (ii) |
|------|---------|
| stem | sexarch |
- c)
- | (i) | (ii) |
|-------|---------|
| roots | endarch |
- d)
- | (i) | (ii) |
|------|---------|
| root | sexarch |
26. In (i) porous wood, vessels are very broad in the (ii) wood and are quite narrow in the (iii) wood. This kind of wood is present in (iv) and it translocates (v) amount of water when required by the plant.
Select the correct fill ups for the above paragraph.
a) (i)-diffuse, (ii)-autumn, (iii)-spring, (iv)-Dalbergia sissoo, (v)-more
b) (i)-diffuse, (ii)-spring, (iii)-autumn, (iv)-Syzygium cumini, (v)-less
c) (i)-ring, (ii)-spring, (iii)-autumn, (iv)-Dalbergia sissoo, (v)-more
d) (i)-ring, (ii)-autumn, (iii)-spring, (iv) Syzygium cumini, (v)-less
27. When xylem and phloem are on same radius, the vascular bundles are said to be-

- a) Radial b) Conjoint c) Concentric d) Concentric
28. Collenchymatous hypodermis is characteristic feature of
a) Dicot stem b) Monocot stem c) Monocot as well as dicot stem
d) Hydrophytes
29. Thin-walled passage cells occur in:
a) Phloem elements as entry points b) Testa for emergence of embryonal axis
c) Central area of style for passage of pollen tube
d) Endodermis of root for quick transport of water from cortex to pericycle
30. The balloon-shaped structures called tyloses _____ .
a) Originate in the lumen of vessels. b) Characterise the sapwood.
c) Are extensions of xylem parenchyma cells into vessels
d) Are linked to the ascent of sap through xylem vessels.
31. A vessel less piece of stem possessing prominent sieve tubes would belong to
a) Pinus b) Eucalyptus c) Grass d) Trochodendron.
32. A piece of wood having no vessels (trachea) must be belonging to
a) teak b) mango c) pine d) palm.
33. The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is _____ .
a) Elongating b) Widening c) Differentiating d) Maturing
34. Radial vascular bundles characteristically occur in
a) monocot and dicot stems b) monocot and dicot leaves
c) monocot and dicot roots d) all of these.
35. Cells of this tissue are living and show angular wall thickenings. They also provide mechanical support. The tissue is
a) xylem b) sclerenchyma c) collenchyma d) epidermis.
36. Water containing cavities in vascular bundles are found in:
a) Sunflower b) Maize c) Cycas d) Pinus
37. Axillary bud and terminal bud are derived from the activity of _____ .
a) Lateral meristem b) Intercalary meristem c) Apical meristem
d) Parenchyma
38. Which one of the following flowers only once in its lifetime?
a) Mango b) Jackfruit c) Bamboo species d) Papaya
39. Read the following statements.
(i) Multicellular epidermal hair
(ii) Collenchymatous hypodermis

(iii) Pith present

(iv) Vascular bundles present in a ring i.e., eustele

Above given features describe which of the following plant parts?

a) Monocot stem b) Monocot root c) Dicot stem d) Dicot root

40. Water conduction in stem of tree takes place made by

a) Duramen b) Sapwood c) Primary xylem d) All of these

41. **Assertion:** Both apical meristem and intercalary meristem are primary meristems.

Reason: Both of these meristems appear early in life of a plant and help in the formation of the primary plant body.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

42. Water cavity & V or y-shaped xylem occurs in

a) Dicot stem b) Monocot root c) Monocot stem d) Dicot root

43. Sea shore trees do not show annual rings because

a) There is little climatic variations b) They belong to monocots

c) There is low temperature d) Soil is sandy

44. Stele does not includes

a) Pericycle b) Vascular bundles c) Pith d) Endodermis

45. Which of the following options correctly shows the sequence of different tissues of the periderm starting from periphery?

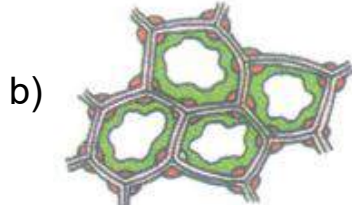
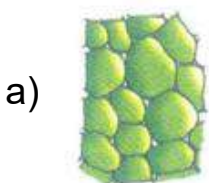
a) Phellogen → Phellem → Phelloderm

b) Phellem → Phelloderm → Phellogen

c) Phellem → Phellogen → Phelloderm

d) Phelloderm → Phellogen → Phellem

46. _____ is a living mechanical tissue.



d) Both (a) and (b)

47. Bark does not include
a) secondary xylem b) secondary phloem c) periderm d) both (a) and (b).
48. Secondary growth usually does not occur in
a) stems and roots of dicots b) stems and roots of gymnosperms
c) stems and roots of monocots d) both (b) and (c).
49. A flower represents a complex array of functionally specialised structures that differ substantially from vegetative plant body in form and cell types. Select the statement that is not true with regard to floral meristems.
a) Floral meristems are larger in size than the vegetative meristems.
b)
Increase in size of the floral meristem is due to larger size of the cells, which in turn results from rapid cell expansion only.
c)
Increase in size of the floral meristem is largely a result of increased rate of cell division in central cells.
d) A floral morphogenesis is controlled by a network of genes in plants.
50. Girdling experiment is not possible in maize and sugarcane because of
a) Scattered vascular bundles b) Open vascular bundles
c) Closed vascular bundles d) Absence of pericycle
51. Age of a tree can be estimated by:
a) Biomass b) Number of annual rings c) Diameter of its heartwood
d) Its height and girth
52. Select the correct pair out of the following.
a) Hypostomatic leaf - Dicots b) Epistomatic leaf - Monocots
c) Amphistomatic leaf - Free-floating hydrophytes
d) Presence of sunken stomata in leaf - Submerged hydrophytes
53. Idioblasts are
a) sclerenchymatous fibres found in the leaf of Yucca
b) specialised parenchymatous cells which contain ergastic substances
c) collenchymatous cells possessing angular thickenings
d) crystals of calcium oxalate found in hard fruits.
54. Match column I with column II and select the correct option from the given codes.

Column I		Column II
A Hardwood	(i)	Duramen
B Softwood	(ii)	Alburnum
C Heartwood	(iii)	Non-porous wood
D Sapwood	(iv)	Porous wood

- a) A-(iv), B-(iii), C -(ii), D-(i) b) A-(iv), B-(iii), C-(i), D-(ii)
 c) A-(iii), B-(iv), C-(i), D-(ii) d) A-(iii), B-(iv), C-(ii), D-(i)

55. Match column I with column II and select the correct option from the given codes.

Column - I		Column -II
A. Bulliform cells	(i)	Regulate opening and closing of stomata
B. Guard cells	(ii)	Aerating pores in the bark of plant
C. Lenticels	(iii)	Rolling in and out of leaves
D. Subsidiary cells	(iv)	Accessory cells

- a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(i), B-(ii), C-(iii), D-(iv)
 c) A-(iv), B-(iii), C-(i), D-(ii) d) A-(ii), B-(iv), C-(iii), D-(i)

56. Innumerable (many) vascular bundles, lack of combium and lack of a well demarcated pith is found in

- a) Sugarcane, Grass b) Sunflower, Neem c) Radish, Neem d) Pea, Peepal

57. Common bottle cork is the product of:

- a) Xylem b) Dermatogen c) Phellogen d) Vascular cambium

58. Interfascicular cambium and cork cambium are formed due to

- a) cell division b) cell differentiation c) cell dedifferentiation
 d) redifferentiation.

59. The intercalary meristems are infact, portions of

- a) Lateral meristem b) Secondary meristem c) Apical meristem
 d) Permanent tissue that becomes meristematic

60. Grafting is successful in dicots but not in monocots because the dicots have-

- a) Vascular bundles arranged in a ring b) Cambium for secondary growth
 c) Vessels with elements arranged end to end d) Cork cambium

61. Which one of the following option is not related to gymnosperm?

- a) Sieve cells, tracheid, albuminous cells
 b) Sieve cells, vessel, companion cells c) Sieve tube, vessel, companion cells
 d) Sieve cells, tracheid, albuminous cells

62. Ectophloic siphonostele is found in _____ .

- a) Osmunda and Equisetum b) Marsilea and Botrychium
 c) Adiantum and Cucurbitaceae d) Dicksonia and Maidenhair fern

63. Which of the following statements are incorrect?

- (i) Secondary growth usually occurs in monocotyledons.
 (ii) Bark refers to all tissues interior to vascular cambium.

(iii) Lenticels permit the exchange of gases between the outer atmosphere and the internal tissue of the stem.

(iv) Annual rings give an estimate of the age of the tree.

a) (i) and (ii) only b) (i) and (ii) only c) (i) and (iv) only d) (ii) and (iv) only

64. Identify the simple tissue from the following.

a) Parenchyma b) Xylem c) Epidermis d) Phloem

65. Pulp of a fruit is made up of mainly

a) Parenchyma b) Collenchyma c) Sclereids d) Meristem

66. Match the scientists in column I with the related terms coined by them in column II and select the correct option from the given codes

	Column - I		Column II
A	N. Grew	(i)	Hadrome and leptome
B	Nageli	(ii)	Tissue
C	Haberlandt	(iii)	Quiescent centre
D	Clowes	(iv)	Xylem and phloem

a) A-(iii), B-(iv), C-(i), D-(ii) b) A-(ii), B-(iv), C-(i), D-(iii)

c) A-(iv), B-(ii), C-(iii), D-(i) d) A-(iv), B-(iii), C-(ii), D-(i)

67. **Assertion:** Secondary growth usually occurs in dicotyledonous stems.

Reason: The vascular cambium present between xylem and phloem possesses the ability to form secondary xylem and secondary phloem respectively.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

68. Each annual ring consists of two strips of

a) Autumn & spring wood b) Heart wood & sap wood c) Xylem and phloem
d) cork & cortex

69. Which of the following statements is correct about a woody dicot stem which shows extensive secondary growth?

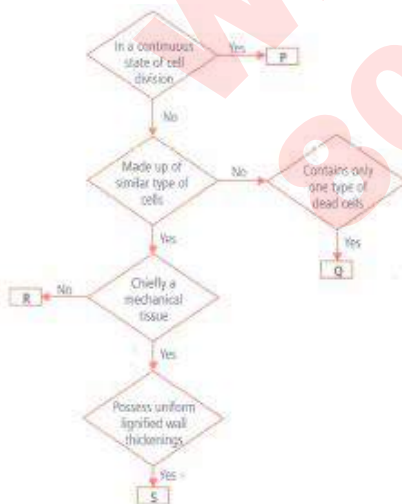
a) Primary xylem persists in the centre of the axis.

b) Primary and the older secondary phloem get crushed.

c) Secondary xylem forms the bulk of the stem. d) All of these

70. Stomata in grass leaf are:

- a) Rectangular b) Kidney shaped c) Dumb-bell shaped d) Barrel shaped
71. At maturity which of the following is enucleate?
a) Sieve cell b) Companion cell c) Palisade cell d) Corrical cell
72. Mechanical tissue consisting of living cells is-
a) Chlorenchyma b) Parenchyma c) Sclerenchyma d) Collenchyma
73. Lysigenous cavity in monocot stem vascular bundles develops by the dissolution of
a) protoxylem b) metaxylem c) phloem d) ground tissue.
74. Cork cambium is
a) Periderm b) Phellem c) Phelloderm d) Phellogen
75. Select the mismatched pair.
a) Root hair - Unicellular b) Stem hair - Multicellular
c) Trichomes - Cause water loss
d) Guard cells - Regulate opening and closing of stomata
76. In dicot root
a) Vascular bundles are scattered with cambium
b) Vascular bundles are open and arranged in a ring
c) Xylem and ppholem are radial d) Xylem is always endarch
77. Abnormal/anomalous secondary growth occurs in _____.
a) Dracaena b) Ginger c) Wheat d) Sunflower
78. Study the flow chart given below



Which of the following statements is incorrect regarding this?

- a) P can be root apical meristem which is generally sub-terminal in position.
b) Q can be phloem which is also called bast.
c) R can be parenchyma which comprises of thin walled isodiametric cells.
d) S can be collenchyma which is a living mechanical tissue.
79. In a dorsiventral leaf, what is true regarding the position of xylem?

- a) Xylem is towards adaxial epidermis. b) Xylem is towards abaxial epidermis.
c) Xylem surrounds phloem. d) Xylem is surrounded by phloem.
80. Which of the following statements are correct about heartwood?
(i) It does not help in water conduction.
(ii) It is also called alburnum.
(iii) It is light in colour and is very soft.
(iv) It has tracheary elements which are filled with tannins, resins, etc.
a) (ii) and (iv) b) (i), (ii) and (iii) c) (ii), (iii) and (iv) d) (i) and (iv)
81. Periderm is produced by _____.
a) Vascular cambium b) Fascicular cambium c) Phellogen
d) Intrafascicular cambium
82. Vascular bundle is enclosed within a well developed sclerenchymatous sheath in
a) monocot stem b) dicot stem c) monocot root d) dicot root.
83. An organised and differentiated cellular structure having cytoplasm but no nucleus is _____.
a) Vessels b) Xylem parenchyma c) Sieve tubes d) Tracheids
84. Which of the following conditions of xylem is present in both monocot and dicot stems?
a) Endarch b) Polyarch c) Mesarch d) Exarch
85. Palisade parenchyma is absent in leaves of:
a) Mustard b) Soybean c) Gram d) Sorghum
86. A dicot root differs from a monocot root in which of the following
a) Presence of piliferous b) presence of exodermis
c) Presence of ill-developed (Poorly developed) pith
d) Seperate radial vasular bundle
87. Hard bast (Bundle cap) occurs in
a) Sunflower stem b) Wheat stem c) Sunflower root d) 1 & 3 both
88. The given figure is present in



- a) fruit walls of nuts b) grit of guava and pear c) seed coats of legumes
d) all of these
89. Procambium form _____.
a) Only primaiy vascular bundles b) Only vascular cambium
c) Only cork cambium d) Primary vascular bundles and vascular cambium

90. Read the following statements and select the correct option.

Statement 1 : Anatomically, all the tissues present on the inner side of endodermis such as pericycle, vascular bundles and pith constitute the stele.

Statement 2: Eustele is the stele in which vascular bundles are arranged in the form of a ring as present in dicot stems

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

91. **Assertion :** Each stoma is composed of two bean shaped cells known as guard cells.

Reason: Guard cells regulate the opening and closing of stomata.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

92. Epidermal tissue system is derived from

- a) protoderm b) procambium c) periblem d) plerome.

93. In dicot stems, cambium present between primary xylem and primary phloem is

- a) fascicular cambium b) intrafascicular cambium c) interfascicular cambium
- d) both (a) and (b).

94. Annual rings are well demarcated in trees growing in

- a) Shimla b) Bombay/Delhi c) Madras d) Udaipur

95. Which of the following facilitates opening of stomatal aperture?

- a) Decrease in turgidity of guard cells
- b) Radial orientation of cellulose microfibrils in the cell wall of guard cells
- c) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
- d) Contraction of outer wall of guard cells

96. The cork cambium, cork and secondary cortex are collectively called:

- a) Phellem b) Phelloderm c) Phellogen d) Periderm

97. Bark of which of the following plants yields a drug for the treatment of malaria?

- a) Cinchona officinalis b) Acacia arabia c) Quercus suber d) Cinnamomum

98. Youngest layer of secondary xylem is located

- a) In the centre of stem b) Just outside the pith
c) Just outside the vascular cambium d) Just inside the vascular cambium
99. In a ring girdled plant :
a) The root dies first b) The shoot and root die together
c) Neither root nor shoot will die d) The shoot dies first
100. Which of the following exemplifies emergences?
a) Root hair b) Stigmatic papillae c) Prickles of **Rosa indica**
d) Oil glands on fruit skins
101. In a longitudinal section of a root, starting from the tip upward, the four zones occur in the following order:
a) Root cap, cell division, cell enlargement, cell maturation
b) Root cap, cell division, cell maturation, cell enlargement
c) Cell division, cell enlargement, cell maturation, root cap
d) Cell division, cell maturation, cell enlargement, root cap
102. **Assertion:** In dicot stem, endodermis is also called as starch sheath.
Reason: The cells of the endodermis are rich in starch grains.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
103. Which one of the following is resistant to enzyme action?
a) Cork b) Wood fibre c) Pollen exine d) Leaf cuticle
104. Select the mismatched pair out of the following.
a) Radial vascular bundle - Xylem and phloem on different radii
b) Bicollateral vascular bundle - Phloem present on both sides of xylem
c) Amphivasal vascular bundle - Phloem surrounds xylem
d) Conjoint vascular bundle - Xylem and phloem on same radii
105. Casparian strips are the bands of thickenings present on _____ walls of endodermis.
a) radial b) tangential c) central d) both (a) and (b)
106. Which of the following tissues originate from ray initials of cambium
a) Tracheids & vessels b) Sieve tubes & companion cells
c) Xylem & phloem fibres d) Radial rows of parenchyma

107. A vascular bundle in which phloem is present on both the sides of the xylem and separated from it by strips of cambium is said to be-
- a) Collateral open b) Bicollateral open c) Concentric d) Bicollateral closed
108. Interfascicular cambium develops from the cells of:
- a) Xylem parenchyma b) Endodermis c) Pericycle d) Medullary rays
109. A leaf primordium grows into the adult leaf lamina by means of _____ .
- a) Apical meristem b) Lateral meristem c) Marginal meristem
d) At first by apical meristem and later largely by marginal meristem
110. Which plant part possesses polyarch condition of vascular bundles with a well developed pith?
- a) Dicot root b) Monocot root c) Dicot stem d) Monocot stem
111. Root cap is not found in
- a) Hollyhock b) Pistia c) Sunflower d) China rose
112. **Assertion :** The greater part of secondary xylem is lighter in colour and consists of dead elements with highly lignified walls and is called heartwood.
Reason: The peripheral region of the secondary xylem is dark brown in colour and is called sapwood.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false.
113. What is the fate of primary xylem in a dicot root showing extensive secondary growth?
- a) It is retained in the centre of the axis. b) It gets crushed.
c) May not get crushed d) It gets surrounded by primary phloem.
114. Bordered pits are found in _____ .
- a) Sieve cells b) Vessel wall c) Companion cells d) Sieve tube wall
115. In Barley stem, the vascular bundles are:
- a) Open and scattered b) Closed and scattered c) Closed and radial
d) Open and in a ring
116. Suberin is chiefly deposited in the cells of
- a) Sclerenchyma b) Collenchyma c) Cork d) Phelloderm

117. Sieve tubes are characterised by
a) Absence of septa b) Simple oblique septa c) Perforated longitudinal walls
d) Perforated
118. Autumn wood can be differentiated from spring wood by
a) Broad vessels and tracheids b) Narrow vessels and tracheids
c) Red colour of xylem d) Cambium
119. Loading of phloem is related to _____.
a) Increase of sugar in phloem b) Elongation of Phloem cell
c) Separation of phloem parenchyma d) Strengthening of phloem fibre
120. In angular collenchyma, thickenings are present _____.
a) at the corners of cell b) throughout the cell wall c) on the tangential walls
d) on the walls bordering intercellular spaces
121. When we peel the skin of a potato tuber, we remove
a) periderm b) epidermis c) cuticle d) sapwood.
122. In monocotyledon roots, the histogen present at the apex of the root tip is
a) Dermatogen b) Procambium c) Calyptragen d) Plerome
123. Sieve tubes are suited for translocation of food because they possess _____.
a) Bordered pits b) No end walls
c) Broader lumen and perforated cross walls d) No protoplasm
124. Three types of tissue system have been recognised in plants on the basis of their functions. Select the correct option regarding this.
a)
Epidermal tissue system consists of epidermis and epidermal appendages, which provide protection to the internal tissues
b)
All tissues except epidermis and vascular bundles constitute the ground tissue, which forms the major part of a plant's body.
c) Vascular tissue system consists of complex tissues i.e., xylem and phloem.
d) All of these
125. Match the following and choose the correct option from below.

A. Meristem	-(i)	Photosynthesis, storage
B. Parenchyma	-(ii)	Mechanical support
C. Sclerenchyma	-(iii)	Actively dividing cells

D. Sclerenchyma	(iv)	Sclereids
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- a) A-(i), B-(iii), (-)(v), D-(ii), E-(iv) b) A-(iii), B-(i), (-)(ii), D-(v), E-(iv)
 c) A-(ii), B-(iv), (-)(v), D-(i), E-(iii) d) A-(v), B-(iv), (-)(iii), D-(ii), Hi
126. Which of the following plant organs do not contain elements is-
 a) Monocot root b) Monnocot stem c) Dico Root d) All of the above
127. In land plants, the guard cells differ from other epidermal cells in having:
 a) Chloroplasts b) Cytoskeleton c) Cytoskeleton d) Endoplasmic reticulum
128. Vascular bundles in monocotyledons are considered closed because:
 a) Xylem is surrounded all around by phloem
 b) Abundle sheath surrounds each bundle c) Cambium is absent
 d) There are no vessels with perforations
129. Select the incorrect pair out of the following.
- a)
- | Type of tissue | Function |
|----------------|-------------------------|
| Parenchyma | Storage, photosynthesis |
- b)
- | Type of tissue | Function |
|----------------|---------------------|
| Sclerenchyma | Mechanical strength |
- c)
- | Type of tissue | Function |
|----------------|---------------|
| Xylem | Ascent of sap |
- d)
- | Type of tissue | Function |
|----------------|----------------------------------|
| Phloem | Conduction of water and minerals |
130. Dervatives of the secondary meristem in the steler region are
 a) Phellem and phelloderm b) Alburnum and primary phloem
 c) Alburnum and primary phloem d) Primary xylem and secondary pjloem
131. A bicollateral vascular bundle is characterised by _____.
 a) Phloem being sandwiched between xylem
 b) Transverse splitting of vascular bundle
 c) Longitudinal splitting of vascular bundle
 d) Xylem being sandwiched between phloem
132. A conjoint and open vascular bundle will be observed in the transverse section of
 a) monocot root b) monocot stem c) dicot root d) dicot stem.
133. Main water conducting element of xylem in soft wood containing plants is
 a) Albuminous cells b) Vessel c) Tracheid d) Xylem parenchyma
134. Specialised epidermal cells surrounding the guard cells are called:
 a) Lenticels b) Complimentary cells c) Subsidiary cells d) Bulliform cells
135. A major characteristic of the mono cot root is the presence of:

- a) Cambium sandwiched between phloem and xylem along the radius
 b) Open vascular bundles c) Scattered vascular bundles
 d) Vasculature without cambium
136. In monocots vascular bundles are of closed type, what does it denote?
 a) Xylem is surrounded by phloem b) Cambium is absent in vascular bundle
 c) The pores of vessel elements and sieve elements are closed
 d) Broad vessels and tracheids
137. In a mature dicot stem which has undergone secondary growth, youngest layer of secondary xylem is situated
 a) in between pith and primary xylem b) just outside the vascular cambium
 c) just inner to the vascular cambium d) just inner to the phellogen.
138. The basic difference between stem and root is that xylem in stem is-
 a) Endarch b) Exarch c) Mesarch d) Polyarch
139. You are given a fairly old piece of dicot stem and dicot root. Which of the following anatomical structure will you use to distinguish between the two:
 a) Secondary xylem b) Secondary phloem c) Protoxylem d) Cortical cells
140. The transverse section of a plant shows following anatomical features:
 a) Large number of scattered vascular bundles surrounded by bundle sheath.
 b) Large conspicuous parenchymatous ground tissue.
 c) Vascular bundles conjoint and closed d) Phloem parenchyma absent.
141. Meristem is characterised by
 a) Isodiametric cells with cellulosic thin wall
 b) Absence of intercellular space and vacuole
 c) Absence of reserve food material, plastids and ER d) All of these
142. Following table summarises the differences between a monocot root and a dicot root.

	Characters	Monocot root	Dicot root
(i)	Vascula bundle	Polyarch i.e., more than 6 vascular bundles	Diarch to hexarch i.e., 2 - 6 vascular bundles
(ii)	Cambium	Absent	Present, so secondary growth occurs
(iii)	Pith	Poorly developed	Well developed large pith
(iv)	Activity of pericycle	Gives rise to secondary roots and cork cambium	Gives rise to lateral roots only

Identify the incorrect differences and select the correct option.

- a) (i) and (iii) b) (i) and (iv) c) (iii) and (iv) d) (ii) and (iii)

143. Vessels and companion cells are respectively present in the xylem and phloem of
a) Gymnosperm b) Pteridophyte c) Angiosperm d) Bryophyta
144. Main function of lenticel is _____.
a) Transpiration b) Guttation c) Gaseous exchange d) Bleeding
145. For a cortical study of secondary growth in plants which one of the following pairs is suitable?
a) Wheat and maiden hair fern b) Sugarcane and sunflower
c) Sugarcane and sunflower d) Deodar and fern
146. Which statements is true?
a) Spring wood is darker in colour with higher density
b) Autumn wood is lighter in colour with higher density
c) Autumn wood is darker in colour with lower density
d) Spring wood is lighter in colour with lower density
147. In temperate regions, cambium is less active during winter season and forms fewer xylary elements that have narrow vessels, this wood is called as
a) spring wood b) autumn wood c) heartwood d) sapwood.
148. Select the incorrect statement regarding the anatomy of a typical monocotyledonous stem.
a) Phloem parenchyma is absent.
b) Vascular bundles are scattered, conjoint, collateral and closed.
c) Each vascular bundle is surrounded by a bundle sheath.
d) Ground tissue is differentiated into cortex, endodermis, pericycle and pith.
149. Which meristem helps in increasing girth?
a) Lateral meristem b) Intercalary meristem c) Primary meristem
d) Apical meristem
150. Passage cells are thin walled cells found in _____.
a)
Phloem elements that serve as entry points for substance for transport to other plant parts
b)
Testa of seeds to enable emergence of growing embryonic axis during seed germination
c)
Central region of style through which the pollen tube grows towards the ovary
d)
Endodermis of roots facilitating rapid transport of water from cortex to pericycle.

151. Identify A, B, C and D in the given transverse section of leaf of Zea mays.

a)

A	B	C	D
Adaxial epidermis	Abaxial epidermis	Phloem	Xylem

b)

A	B	C	D
Abaxial epidermis	Adaxial epidermis	Phloem	Xylem

c)

A	B	C	D
Adaxial epidermis	Abaxial epidermis	Phloem	Xylem

d)

A	B	C	D
Abaxial epidermis	Adaxial epidermis	Phloem	Xylem

152. Secondary phloem is formed by

- a) Procambium b) Plerome c) Vascular cambium d) Apical meristem

153. Angular collenchyma occurs in _____.

- a) Cucurbita b) Tagetes c) Althaea d) Salvia

154. Reduction in vascular tissue, mechanical tissue and cuticle is characteristic of:

- a) Hydrophytes b) Xerophytes c) Mesophytes d) Epiphytes

155. In leaf anatomy, phloem is directed towards

- a) Upper epidermis b) Lower epidermis c) Middle part of V.Bs.
d) Lateral side

156. In a dorsiventral leaf, location of palisade tissue and phloem is respectively on the _____ surfaces.

- a) adaxial and abaxial b) adaxial and adaxial c) abaxial and adaxial
d) abaxial and abaxial

157. Collenchyma differs from sclerenchyma in-

- a) Retaining protoplasm at maturity b) Having thick lumen
c) Being a wide lumen d) Being meristematic

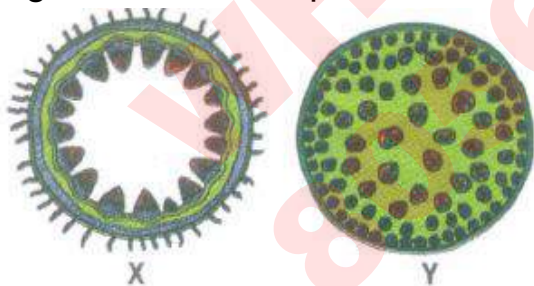
158. Monocot root is differ from dicot root in having:

- a) Open vascular bundle b) Scattered vascular bundle c) Large pith
d) Radial vascular

159. Which of the following meristems is responsible for extrastelar secondary growth in dicotyledonous stem?

- a) Intrafascicular cambium b) Interfascicular cambium
c) Intercalary meristem d) Phellogen

160. Primary growth in grasses occurs due to the activity of
 a) Cork cambium b) Intercalary meristem c) Lateral meristem
 d) Primordial meristem
161. Stomata which remain surrounded by a pair of subsidiary cells whose common wall is at right angles to guard cells are called
 a) anomocytic b) anisocytic c) paracytic d) diacytic.
162. The chief function of a xylem vessel in a plant body is to-
 a) Conduct sap b) Conduct mineral salts only
 c) Eliminate excess of water at night d) Translocate organic nutrients
163. Which of the following is made up of dead cells:
 a) Xylemparenchyma b) Collenchyma c) Phellem d) Phloem
164. The vascular cambium normally gives rise to:
 a) Phelloderm b) Primary phloem c) Secondary xylem d) Periderm
165. Extra stelar secondary growth in dicot stem occurs due to the activity of
 a) Intrafascicular cambium b) Interfascicular cambium c) Vascular cambium
 d) Cork cambium
166. Chlorenchyma is known to develop in the _____.
 a) Pollen tube of Pinus b) Cytoplasm of Chlorella
 c) Mycelium of a green mould such as Aspergillus d) Spore capsule of a moss
167. Figures X and Y represent the transverse sections of ____ and respectively.



a)

X	Y
dicot	dicot
root	stem

b)

X	Y
monocot	monocot
root	stem

c)

X	Y
dicot	monocot
stem	stem

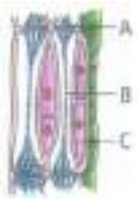
d)

X	Y
monocot	dicot
stem	stem

168. Ground tissue includes:
 a) All tissues internal to endodermis b) All tissues external to endodermis
 c) All tissues except epidermis and vascular bundles d) Epidermis and cortex
169. In which of the following order, an exarch exlem develops
 a) Centripetal b) Centrifugal c) Both Centripetal & Centrifugal
 d) Centrifugal
170. Commercial cork is obtained from _____.

- a) Betula/Birch b) Berberis/Barberry c) Salix/Willow d) Quercus/Oak

171. Identify the given figure and select the correct option for the parts labelled as A, B and C.



- a)
- C represents the cells which are replaced by albuminous cells in non-flowering plants such as gymnosperms.
- b) A represents phloem
- c) B represents the cells which become dead on maturity. d) All of these
172. Lenticels are involved in:
- a) Photosynthesis b) Transpiration c) Gaseous exchange
- d) Food transport
173. Vessels are found in _____.
- a) All angiosperms and some gymnosperms
- b) Most of angiosperms and few gymnosperms
- c) All angiosperms, all gymnosperms and some pteridophyta
- d) All pteridophyta
174. The balloon like outgrowths of parenchyma in the lumen of a vessel are known as
- a) Histogen b) Tyloses c) Phellogen d) Tunica
175. Plants showing anomalous secondary growth include
- a) Agave b) Dracaena c) Yucca d) all of these.
176. Transport of food material in higher plants takes place through:
- a) Transfusion tissue b) Tracheids c) Sieve elements d) Companion cells
177. Annual rings are the bands of
- a) Secondary cortex and cork b) All secondary xylem is located
- c) Secondary xylem and xylem rays d) Secondary phloem and medullary rays
178. Which of the following statements is incorrect?
- a) In a dicot stem, the pericycle is usually multilayered.
- b) Wood is the common name used for secondary xylem.

c)

Peripheral cytoplasm, a large vacuole and a prominent nucleus; all are absent in a mature sieve tube element.

d)

Lenticels are the aerating pores present in bark of plants and are associated with gaseous exchange.

179. End walls of tracheids and vessels respectively are:

- a) Pitted & perforated b) Perforated & pitted c) Both perforated
- d) Both pitted

180. How many shoot apical meristems are likely to be present in a twig of a plant possessing 4 branches and 26 leaves?

- a) 26 b) 1 c) 5 d) 30

181. Vascular cambium and cork cambium are the examples of

- a) apical meristem b) lateral meristem c) intercalary meristem
- d) promeristem.

182. Secondary medullary ray are produced by

- a) Fusiform initial b) Interfascicular cambium c) Phellogen d) Ray initial

183. How many histogens are present in monocot root apex:

- a) 1 b) 2 c) 3 d) 4

184. In leaves, the vascular bundles are

- a) Bicollateral & open b) Collateral & open c) Collateral & closed
- d) Radial & exarch

185. Polyarch and exarch vascular bundles are the characteristic of

- a) Dicot stem b) Dicot root c) monocot stem d) Monocot root

186. A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested chemically. Which one of the following test results indicates that it is phloem sap?

- a) Acidic b) Alkaline c) Low refractive index d) The absence of sugar.

187. Dendrochronology is the study of determination of

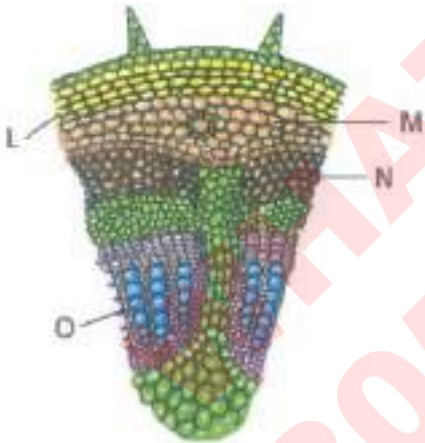
- a) Height of a tree b) Diameter of a tree
- c) Age of a tree with help of annual rings
- d) Counting of the number of branches

188. The cell functionally associated with sieve element is-

- a) Phloem fibres b) Phloem Parenchyma c) Companion cell
- d) Collenchyma

189. There is no result of 'Girdling Experiment' in monocot plants, due to:

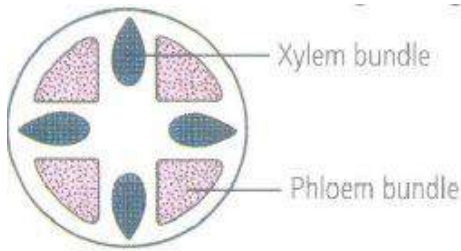
- a) Presence of wax layer on the surface of its stem
 - b) Stem is comparatively thin c) Phloem is inside xylem
 - d) Vascular bundles are not in specific position
190. A meristem may be defined as the group of cells.
- a) Does not divide b) Conserve food
 - c) Divide continuously to give rise to the group of cells
 - d) Elongate, mature and add to the group of cells.
191. Secondary meristems are derived from
- a) Promeristems b) Primary meristem c) Primary permanent tissue
 - d) Lateral meristem
192. A timber merchant told his customer that log of wood which he was purchasing comes from a 20 years old tree, he told so by inspecting the
- a) Diameter of log b) Thickness of the heart wood c) Number of cork layers
 - d) Annual rings
193. Consider the following statements regarding the given figure and select the correct one.



- a)
 - 'L' is the collenchymatous hypodermis that provides mechanical strength and flexibility to young dicot stems.
 - b) 'M' is the innermost layer of cortex which usually possesses Casparian strips.
 - c) 'N' is the parenchymatous pericycle that synthesises food.
 - d)
 - 'O' is xylem which is exarch with respect to the positions of protoxylem and metaxylem
194. Collenchyma occurs in the stem and petioles of _____.
- a) Xerophytes b) Monocots c) Dicot herbs d) Hydrophytes
195. Cortex is the region found between _____.
- a) Epidermis and stele. b) Pericycle and endodermis
 - c) Endodermis and pith. d) Endodermis and vascular bundle.

196. A transverse section of stem is stained first with safranin and then with fast green following the usual schedule of double staining for the preparation of a permanent slide. What would be the colour of the stained xylem and phloem?
a) Red and green b) Green and red c) Orange and yellow
d) Purple and orange
197. **Assertion:** The trichomes in the shoot system are usually multicellular.
Reason: The trichomes help in preventing water loss due to evaporation.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
198. Root hairs develop from the region of:
a) Maturation b) Elongation c) Root cap d) Meristematic activity
199. What is the characteristics of a vascular bundle of monocot stem
a) Open and surrounded by a sclerenchymatous bundle sheath
b) Closed and not surrounded by bundle sheath
c) Closed and surround by bundle sheath
d) Open and not surrounded by a bundle sheath
200. Plasmodesmata which maintain cell to cell cytoplasmic connection, are quite common in
a) Parenchyma b) Xylem fibres c) Sclereids d) Sclerenchyma fibres
201. Cortex and pith are not distinguished in
a) Monocot stem b) Monocot root c) Dicot stem d) Dicot root
202. Which one of the following cell types always divides by anticlinal cell division?
a) Fusiform initial cells b) Root cap c) Protoderm d) Phellogen
203. The chief water conducting elements of xylem in gymnosperms are:
a) Tracheids b) Vessels c) Fibres d) Transfusion tissue

204. Identify the type of vascular bundle as shown in the figure and select the incorrect statement regarding it.



- a)
Figure represents radial vascular bundles in which xylem and phloem occur in the form of separate bundles.
- b) Xylem bundles and phloem bundles occur on different radii.
c) These are the characteristic of monocot and dicot leaves. d) None of these
205. Which of the following tissues has dead cells with thick and lignified cell walls, having a few or numerous pits?
a) Sclerenchyma b) Collenchyma c) Collenchyma d) None of these
206. Cell wall in dead mechanical tissue show
a) Lignified nature b) Cutinised nature c) Pectose deposition
d) Hemicellulose deposition
207. Select the true statement:
a) Lenticels are absent in woody climbers leaves
b) Lenticels occur in most woody trees
c) The spring wood is lighter in colour and has a long density
d) The sap wood also called as duramen
208. Polyarch vascular bundles generally occur in
a) monocot stem b) dicot stem c) dicot root d) monocot root.
209. Meristematic tissues are composed of
a) mature cells b) fully differentiated cells c) cells that cannot divide
d) immature cells with power to divide.
210. Phloem parenchyma is absent in-
a) Dicot stem b) Dicot leaf c) Monocot stem d) Dicot root
211. **Assertion:** Fascicular vascular cambium, interfascicular cambium and cork-cambium are examples of lateral meristems.
Reason : These are responsible for producing the secondary tissues.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

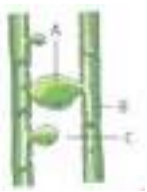
d) If both assertion and reason are false.

212. The growth of roots and stems in length with the help of apical meristem is called

a) primary growth b) lateral growth c) secondary growth

d) intercalary growth

213. Identify the given figure and select the correct labels for A, B and C.



a)

A	B	C
Callose	Xylem parenchyma	Xylem vessel

b)

A	B	C
Callose	Phloem parenchyma	Phloem vessel

c)

A	B	C
Tylosis	Xylem parenchyma	Xylem vessel

d)

A	B	C
Tylosis	Phloem parenchyma	Phloem vessel

214. The common bottle cork is a product of:

a) Dermatogen b) Phellogen c) Xylem d) Vascular Cambium

215. **Assertion:** In dicot leaf, epidermis covers both the upper surface (adaxial epidermis) and lower surface (abaxial epidermis).

Reason : The adaxial epidermis bears more stomata than the abaxial epidermis.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false

d) If both assertion and reason are false.

216. The cells of the quiescent centre are characterised by

- a) having dense cytoplasm and prominent nuclei
 b) having light cytoplasm and small nuclei
 c) dividing regularly to add to the corpus d) dividing regularly to add to tunica.
217. Read the different components from (A) to (D) in the list given below and tell the correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem.
- (A) Secondary cortex
 (B) Wood
 (C) Secondaryphloem
 (D) Phellem
- The correct order is:
- a) (A),(B),(D),(C) b) (D),(A),(C),(B) c) (D),(C),(A),(B) d) (C),(D),(B),(A)
218. Match column I with column II and select the correct option from the given codes
- | Column I | Column II |
|--------------------|---|
| A Stele | (i) Innermost layer of cortex |
| B Endodermis | (ii) Suberin |
| C Casparian strips | (iii) All the tissues outer to vascular cambium |
| D Bark | (iv) All the tissues inner to endodermis |
- a) A-(iv), B-(i), C-(ii), D-(iii) b) A-(iii), B-(ii), C-(i), D-(iv)
 c) A-(i), B-(ii), C-(iii), D-(iv) d) A-(iv), B-(ii), C-(i), D-(iii)
219. A typical monocotyledonous root is characterised by
- a) usually more than six xylem bundles b) large and well developed pith
 c) no secondary growth d) all of these.
220. Transmission tissue is characteristic feature of:
- a) Solid style b) Dry stigma c) Wet stigma d) Hollow style
221. As the secondary growth takes place (proceeds) in a tree, thickness of _____.
- a) Heartwood increases b) Sapwood increases c) Both increase
 d) Both remain the same
222. Phellogen and phellem respectively denote
- a) cork and cork cambium b) cork cambium and cork
 c) secondary cortex and cork d) secondary cortex and cork
223. Vascular bundles are found scattered in ground tissue in
- a) Maize stem b) Sunflower stem c) Gram root d) Isobilateral leaf
224. Read the following statements and select the correct option.

Statement 1: Annual rings are distinct in plants growing in temperate regions.

Statement 2: In temperate regions, the climatic conditions are not uniform

through the year.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

25. Match the following :

(a) Early wood	(i)	Innermost mass of wood
(b) Late wood	(ii)	Wood just inner to vascular cambium
(c) Heart wood	(iii)	Low density
(d) Sap wood	(iv)	High density

a)	b)	c)	d)
a b c d	a b c d	a b c d	a b c d
iii iv i ii	iii iv iii i	iv iii iii i	iv iii i ii

26. Tracheids differ from other tracheary elements in:

- a) Having casparian strips b) Being imperforate c) Lacking nucleus
- d) Being lignified

27. Passage cells are found in endodermis of-

- a) Dicot stem b) Monocot stem c) Orchid d) Monocot root

28. What is the position of oldest secondary phloem?

- a) Just outside the pericycle b) Just outside the vascular cambium
- c) Just inside the pericycle d) Below the vascular cambium

29. Vascular tissues in flowering plants develop from:

- a) phellogen b) Plerome c) Periblem d) Dermatogen

30. **Assertion:** The wood is actually secondary xylem.

Reason : Secondary growth occurs in most of the monocot roots and stems.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

31. Which one of the following is not a characteristic of meristematic cells?

- a) Presence of intercellular spaces b) Thin cellulosic cell walls
- c) Presence of prominent nucleus d) High metabolic rate

232. **Assertion :** Vascular bundles are conjoint, collateral and closed in dicot stem.

Reason: Vascular bundles are conjoint, collateral and open in monocot stem.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

233. In _____ vascular bundle, a strip of vascular cambium is present in between the xylem and phloem.

a) open b) closed c) endarch d) exarch

234. In conifers fibres are likely to be absent in

a) secondary phloem b) secondary xylem c) primary phloem d) leaves.

235. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Vessels	(i) Cells are living, with thin cellulosic cell walls
B. Tracheids	(ii) Cells possess highly thickened walls with obliterated central lumen
C. Xylem fibres	(iii) Individual members are interconnected through perforations in their common walls
D. Xylem parenchyma	(iv) Elongated tube-like cells with thick, lignified walls and tapering ends

a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(iii), B-(iv), C-(ii), D-(i)

c) A-(ii), B-(iv), C-(iii), D-(i) d) A-(iv), B-(ii), C-(iii), D-(i)

236. Stomata are distributed more on the lower surface than on the upper surface in

a) equifacial leaf b) bifacial leaf c) unifacial leaf d) both (a) and (b).

237. The length of different internodes in a culm of sugarcane is variable because of:

a) Intercalary meristem b) Shoot apical meristem

c) Size of lamina of lower node d) All of the above

238. Position of xylem & phloem in leaf respectively

a) Abaxial & Adaxial b) Adaxial & Abaxial c) Both Adaxial d) Both abaxial

239. Closed vascular bundles lack:

a) Cambium b) Pith c) Ground tissue d) Conjunctive tissue

240. Meristem present at Lamina margin is:

- a) Apical meristem b) Intercalary meristem c) Mass meristem
d) Marginal meristem

241. Stele includes

- a) pericycle b) vascular bundles c) pith d) all of these.

242. **Assertion :** Xylem vessel is a long cylindrical tube like-structure made up of many cells each with lignified walls.

Reason: Presence of vessels is a characteristic feature of gymnosperms.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

243. Companion cells are closely associated with:

- a) Trichomes b) Guard cells c) Sieve elements d) Vessel elements

244. Increase in girth of the plant as a result of the activities of primary and secondary lateral meristems is called

- a) primary growth b) lateral growth c) secondary growth
d) intercalary growth.

245. Which of the following tissue provide tens strength to young dicot stem against bending swaying-

- a) Parenchyma b) Collenchyma c) Sclerenchyma d) Sclereids

246. Identify the plants (from the list i-vi) which possess the given type of guard cells (as shown in the diagram) in their leaves.



(i) Grass

(ii) Tomato

(iii) Banana

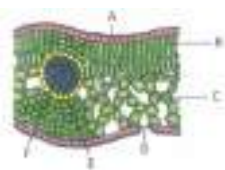
(iv) Brinjal

(v) Soybean

- a) (i), (ii) and (v) b) (ii), (iii) and (iv) c) (i), (iii) and (vi) d) (iv), (v) and (vi)

247. Formation of which tissue is example dedifferentiation

- a) Interfascicular cambium b) Apical meristem c) Intrafascicular cambium
d) Intercalary meristem
248. Sugar transport elements of gymnosperms & pteridophytes are
a) Sieve cells b) Sieve elements c) Sieve tubes d) Sieve tube elements
249. Phelloderm is formed by-
a) Vascular cambium b) Phellogen c) Fascicular cambium
d) Interfascicular cambium
250. Heartwood differs from sapwood in:
a) Being susceptible to pests and pathogens b) Presence of rays and fibres
c) Absence of vessels and parenchyma
d) Having dead and non-conducting elements
251. In plants, which of the following cells are living
a) Xylem vessels b) Meristem c) Cork d) Fibres
252. In temperate regions, during spring season, cambium is very active and produces a large number of xylary elements having vessels with wider cavities. Wood formed in this way is called as
a) spring wood b) autumn wood c) early wood d) both (a) and (c).
253. As compared to spring wood, autumn wood has
a) more number of xylary elements with wider vessels
b) more number of xylary elements with narrow vessels
c) fewer xylary elements with wider vessels
d) fewer xylary elements with narrow vessels.
254. The given figure shows IS. of Helianthus leaf with various parts labelled as A. B, C. D, E, F and G. Identify the parts and select the correct option.



- a)
A-Epidermis, B-Spongy parenchyma, C-Palisade parenchyma, D-Stomata, E-Phloem, F-Xylem
- b)
A-Epidermis, B-Palisade parenchyma, C-Spongy parenchyma, D-Stomata, E-Xylem, F-Phloem

c)

A-Epidermis, B-Palisade parenchyma, C-Spongy parenchyma, D-Stomata, E-Endodermis, F-Xylem

d)

A-Epidermis, B-Palisade parenchyma, C-Spongy parenchyma, D-Stomata, E-Phloem, F-Xylem

255. Some vascular bundles are described as open because these :

a) Are not surrounded by pericycle

b) Are surrounded by pericycle but no endodermis

c) Are capable of producing secondary xylem and phloem

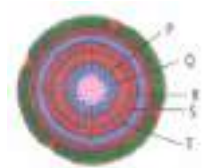
d) Possess conjunctive tissue between xylem and phloem

256. Histogens are components of

a) Apical meristem b) Intercalary meristem c) Lateral meristem

d) Secondary meristem

257. Identify P, Q, R, S and T in the given T.S. of dicot stem showing secondary growth and select the correct option.



a)

P	Q	R	S	T
Primary phloem	Primary xylem	Vascular cambium	Secondary xylem	Secondary phloem

b)

P	Q	R	S	T
Primary phloem	Primary xylem	Vascular cambium	Secondary xylem	Secondary phloem

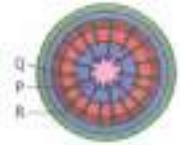
c)

P	Q	R	S	T
Primary xylem	Primary xylem	Vascular cambium	Secondary phloem	Primary phloem

d)

P	Q	R	S	T
Primary xylem	Secondary xylem	Vascular cambium	Secondary phloem	Primary phloem

258. During the secondary growth in a dicotyledonous stem, the fusiform initials of vascular cambium give rise to which of the given labelled part?



a) P b) R c) Q d) both (a) and (b).

259. Bast fibres are mostly found in-

a) Secondary xylem b) Secondary phloem c) Primary phloem
d) Primary xylem

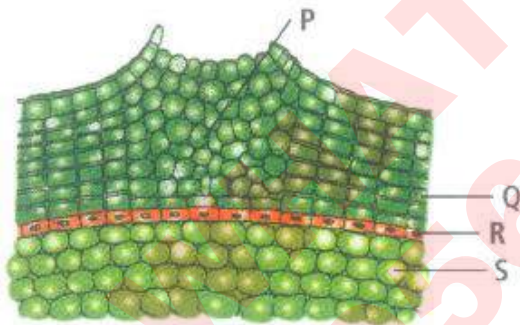
260. Which of the following tissue systems constitutes bulk of the plant body?

a) Epidermal tissue system b) Ground tissue system
c) Vascular tissue system d) Both (a) and (c)

261. Bark formed early in the season is called as _____ bark and bark formed towards the end of the season is called _____ bark.

a) hard, soft b) soft, hard c) scaly, ring d) ring, scaly

262. The given transverse section of stem showing periderm, identify the parts labelled P, Q, R, S and select the correct option.



a)

P	Q	R	S
Complementary cells	Cork	Phellogen	Phelloderm

b)

P	Q	R	S
Complementary cells	Cork	Phelloderm	Phellogen

c)

P	Q	R	S
Lenticels	Phelloderm	Phellogen	Cork

d)

P	Q	R	S
Complementary cells	Phelloderm	Phellogen	Phelloderm

263. The collective term used for phelloderm (secondary cortex), cork cambium (phellogen) and cork (phellem) is

a) pericyde b) periderm c) protoderm d) procambium.

264. Secondary xylem and phloem in dicot stem are produced by:

a) Phellogen b) Vascular cambium c) Apical meristems
d) Axillarymeristems

265. The given figure shows which of the following cells?



a) Companion cell b) Sieve tube element c) Xylem vessel
d) Xylem tracheid

266. Annular and spiral thickened conducting elements generally develop in protoxylem when root or stem is:

a) Widening b) Differentiating c) Maturing d) Elongating

267. The water containing cavities in vascular bundles occur in:

a) Sunflower b) Maize c) Pinus d) Cycas

268. Heart wood is

a) Situated away form vascular cambium b) Situated near pith
c) Nonfunctional d) All of these

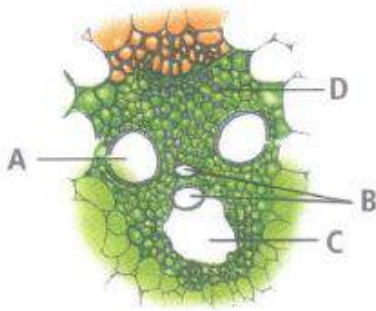
269. Phellogen cuts off derivatives on the inner side to form _____ and on the outer side to form _____.

a) cork, secondary cortex b) secondary cortex, cork c) cork cambium, cork
d) cork cambium, secondary cortex

270. During secondary growth in a dicot root, cork cambium is formed by the activity of

a) perkyde b) epidermis. c) cortex d) hypodermis

271. All the xylem elements, when mature, are dead except
 a) tracheids b) vessels c) xylem parenchyma d) xylem fibres.
272. Y- shaped arrangement of xylem vessels is found in
 a) monocot stem b) dicot stem c) monocot root d) dicot root.
273. Bone shaped sclerenchymatous cells found in hypodermal layers of some seeds and fruits are called
 a) osteosclereids b) macrosclereids c) brachysclereids d) trichosclereids.
274. Refer to the given figure which represents a section of vascular bundle as seen in IS. of a monocot stem and select the option that correctly labels A, B, C and D.



a)

A	B	C	D
Protoxylem vessel	Metaxylem	Protoxylem	Phloem

b)

A	B	C	D
Protoxylem vessel	Metaxylem vessel	Metaxylem cavity	Phloem

c)

A	B	C	D
Protoxylem vessel	Metaxylem vessel	Metaxylem cavity	Phloem

d)

A	B	C	D
Metaxylem vessel	Protoxylem vessel	Protoxylem cavity	Sclerenchyma

275. Vascular tissues of angiosperms differ from those of gymnosperms in
 a) presence of vessels in the xylem
 b) presence of well developed sieve tubes in phloem
 c) presence of companion cells in phloem d) all of these.
276. A common structural feature of vessel elements and sieve tube elements is:
 a) Thick secondary walls b) Pores on lateral walls c) Presence of P-protein
 d) Eucleate condition
277. Root cap in monocots is formed by
 a) dermatogen b) calyptragen c) vascular cambium d) wound cambium.
278. Which of the following causes almost unbearable irritation of the skin?

- a) Lint of Gossypium b) Staminal hair of Tradescantia
c) Prickles of Rosa indica d) Stinging hair of Urtica dioica

279. Which tissue remains more active during auture

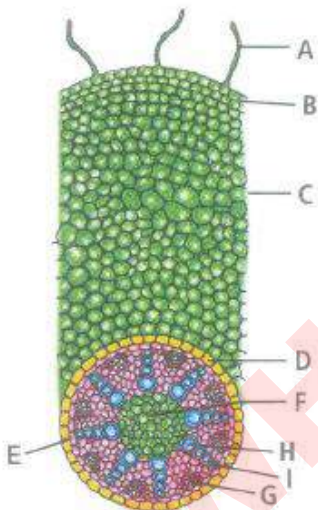
- a) Vascular cambium b) Cork cambium c) Parenphyma d) Sclerenchyma

280. Out of diffuse porous and ring porous woods, which is correct?

- a) Ring porous wood, carries more water for short period
b) Diffuse porous wood carries more water
c) Ring porous wood carries more water when need is higher
d)

Diffuse porous wood is less specialised but conducts water rapidly through out

281. Transverse section of a part of a typical monocotyledonous root has been shown in the given figure. Identify the different parts (from A to I) and select the correct option.



- a)
A-Root hair, B-Epiblema, C-Cortex, D-Endodermis, E- Pericycle, F-Pith, G- Phloem, H-Metaxylem, I-Protoxylem
- b)
A-Root hair, B-Epiblema, C-Cortex, D-Pericycle, E-Endodermis, F-Pith, G- Phloem, H-Metaxylem, I-Protoxylern
- c)
A-Root hair, B-Epiblema, C-Cortex, D-Endodermis, E-Pericycle, F-Pith, G- Phloem, H-Protoxylem, I-Metaxylem
- d)
A-Root hair, B-Cortex, C - Epiblema, D-Pericycle, E-Endodermis, F-Passage cell, G - Protoxylem, H - Phloem, I-Metaxylem

282. Match column I with column II and select the correct option from the given codes.

Column I	Column - II
A Bhojpatra	(i) Bark of Cinchona

Column I	Column - II
B Quinine	(ii) Cork of Quercus suber
C Insulators(soundproofing)	(iii) Bark of Betula
D Dakhini	(iv) Bark of Cinnamomum

a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(iv), B-(i), C-(ii), D-(iii)

c) A-(iv), B-(ii), C-(iii), D-(i) d) A-(iii), B-(i), C-(iv), D-(ii)

283. The secondary meristem originates from-

- a) Promeristem b) Primary meristem c) Primary permanent tissue
d) Secretory tissue

284. Study the following statements regarding the anatomy of isobilateral leaf.

- (i) Stomata are equally distributed on both the surfaces.
(ii) Certain adaxial epidermal cells are modified into bulliform cells in grasses.
(iii) The vascular bundles are radial.
(iv) Phloem is adaxially placed.

Which of the above statements are correct?

- a) (i) and (ii) b) (ii) and (iii) c) (ii) and (iv) d) All are correct

285. Match the following:

(a) Parenchyma	(i) Root pericycle
(b) Collenchyma	(ii) Hypodermis of dicot stem
(c) Sclerenchymatous	(iii) Pericycle of stem of Linum fibres
(d) sclerenchymatous sclereids	(iv) Pulp of pear

a) a-i, b-ii, c-iii, d-iv b) a-iv, b-iii, c-ii, d-i c) a-i, b-ii, c-iv, d-iii

d) a-i, b-iii, c-ii, d-iv

286. **Assertion:** Phloem fibres or bast fibres are made up of collenchymatous cells.

Reason: Phloem fibres are generally found in primary phloem.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

287. How many types of cells are present in vascular cambium of dicot stem

- a) Two types, fusiform & ray initial b) Only fusiform initial c) Only ray initial
d) Three types fusiform, ray and medullary ray

288. Vascular issue having abundant vessels and fibers is

a) Primary xylem b) Secondary xylem c) Protoxylem d) Metaxylem

289. Read the following statements regarding meristematic cells and select the correct ones.

- (i) Cells possess the ability to grow and divide.
 (ii) Cells have dense cytoplasm with prominent nucleus.
 (iii) Well developed ER and mitochondria are present.

a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

290. The terms 'wood' and 'bast' respectively refer to

- a) xylem and cork b) phloem and xylem c) xylem and phloem
 d) phloem and cork

291. Transport of food material in higher plants:

- a) Companion cells b) Transfusion tissue c) Tracheids d) Sieve elements

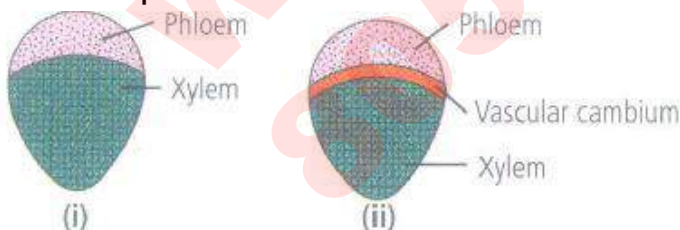
292. In which of the following pairs of parts of a flowering plant is epidermis absent?

- a) Root tip and shoot tip b) Shoot bud and floral bud c) Ovule and seed
 d) Petiole and pedicel

293. Which is correct about transport or conduction of substances?

- a) Organic food moves up through phloem
 b) Organic food moves up through xylem
 c) Inorganic food moves upwardly and downwardly through xylem
 d) Organic food moves upwardly and downwardly through phloem

294. Identify the types of vascular bundle in the figures (i) and (ii) and select the correct option.



a)

(i)	(ii)
Conjoint collateral	Conjoint bicollateral

b)

(i)	(ii)
Conjoint bicollateral	Conjoint collateral

c)

(i)	(ii)
Conjoint collateral closed	Conjoint collateral open

d)

(i)	(ii)
Conjoint collateral open	Conjoint collateral closed

295. Epiblema of roots is equivalent to

a) pericycle b) endoderm c) epidermis d) stele.

296. **Assertion:** Sclereids are found in fruit walls of nuts, pulp of fruits like guava, pear and sapota and seed coats of legumes.

Reason: Sclereids are spherical, oval or cylindrical, highly thickened dead cells with narrow lumen.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

297. Cork is impervious to water due to the presence of _____ in its cell wall.

a) silica b) CaCO_3 c) suberin d) cuticle

298. Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by:

a) Absence of secondary phloem b) Presence of cortex

c) Position of protoxylem d) Absence of secondary xylem

299. Four radial vascular bundles are found in _____.

a) Dicot root b) Monocot root c) Dicot stem d) Monocot stem

300. Intrafascicular cambium is situated

a) In between the vascular bundles b) Inside the vascular bundles

c) Outside the vascular bundles d) In pith

301. Given are a few peculiar parts/structures found in plants. Cucurbita stem, potato tuber, walnut shell, jute fibres. Identify the tissue responsible for the distinguishing feature in each part respectively and select the correct option.

a) Collenchymatous hypodermis, Parenchyma, Sclerenchyma, Phloem

b) Collenchymatous hypodermis, Sclerenchyma, Parenchyma, Phloem

c) Parenchymatous hypodermis, Parenchyma, Sclerenchyma, Xylem

d) Collenchymatous hypodermis, Parenchyma, Sclerenchyma, Xylem

302. Read the following statements with 1-2 blanks in each one of them

(i) In monocot root, a large number of vascular bundles are arranged in the form of a _____ around the central _____.

(ii) Due to the presence of _____ the endodermal cells do not allow wall to wall movement of substances between cortex and pericycle, in a primary dicot root.

- (iii) The epidermis of stem of sunflower bears several unbranched _____ hair.
- (iv) The central portion of a dicot stem is usually occupied by _____ comprising of thin-walled parenchymatous cells.
- Select the option that correctly fills the blanks in any two of them.
- a) (i) ring, pith; (ii) hypodermis b) (ii) Casparian strips; (iii) unicellular
c) (i) ring, cortex; (iv) vascular bundles d) (iii) multicellular; (iv) pith
303. Bundle sheath extensions in a dicot leaf and in a monocot leaf are _____ and _____ respectively.
- a) parenchymatous, collenchymatous b) parenchymatous, sclerenchymatous
c) sclerenchymatous, parenchymatous
d) collenchymatous, sclerenchymatous
304. Which one of the following is not a lateral meristem ?
- a) Intercalary meristem b) Intrafascicular cambium
c) nterfascicular cambium d) Phellogen
305. Study carefully the following statements and select the incorrect one(s).
- (i) Lateral roots develop from pericycle.
(ii) Endodermis is the innermost layer of cortex.
(iii) Sapwood is the central, dark coloured, nonconducting part of secondary xylem.
- a) (i) and (ii) b) (ii) and (iii) c) (i) only d) (iii) only
306. The vascular bundles in dicot root are
- a) Radial and endarch b) Conjoint and exarch c) Concentric and exarch
d) Radial and exarch
307. Which of the following tissues form the main bulk of storage organ-
- a) Parenchyma b) Collenchyma c) Sclerenchyma d) Sclerenchyma
308. Gymnosperms are also called soft wood spermatophytes because they lack:
- a) Thick-walled tracheid b) Xylem fibres c) Cambium d) Phloem fibres
309. Both apical meristem and intercalary meristem are _____ meristems.
- a) primary b) secondary c) lateral d) both (b) and (c)
310. Identify the wrong statement in context of heartwood.
- a) Organic compounds are deposited in it b) It is highly durable
c) It conducts water and minerals efficiently
d) It comprises of dead elements with highly lignified walls
311. Assertion: Cork or phellem is impervious to water.
Reason : Cork has suberin deposition in the cell wall.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

312. **Assertion:** A simple tissue is made of only one type of cells.

Reason : Various simple tissues in plants are parenchyma, collenchyma and sclerenchyma.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

313. Which of the following is an incorrect pair?

a)

Hypostomatic - Stomata present more on lower epidermis than on upper epidermis

b)

Epistomatic - Stomata present more on upper epidermis than on lower epidermis

c) Amphistomatic - Stomata non-functional or absent

d) Sunken stomata - Stomata deep seated below the surface

314. Tissue is the group of cells which are

a) Similar in origin, but dissimilar in form and function

b) Similar in origin and form, but dissimilar in function

c) Similar in origin, form and function

d) Dissimilar in origin, but similar in form and function



Ravi Maths Tuition Centre

Time : 1 Mins

STRUCTURAL ORGANISATION IN ANIMALS 1

Marks : 671

- Bone is connected to muscles with the help of
a) ligament b) cartilage c) tendon d) none of these.
- Match column I with column II and select the correct option from the codes given below.

	Column - I		Column - II
A.	Simple columnar	(i)	Wall of heart epithelium
B.	Cardiac muscle	(ii)	Bone joints
C.	Adipose tissue	(iii)	Inner lining of stomach and intestine
D.	Hyaline cartilage	(iv)	Below the skin, in the abdomen, buttocks, thighs and breasts
		(v)	Diaphragm

- a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(iii), B-(v), C-(ii), D-(iv)
c) A-(i), B-(iii), C-(iv), D-(v) d) A-(iii), B-(i), C(iv), D-(ii)
- Mast cells secrete _____.
a) Myoglobin b) Histamine c) Haemoglobin d) Hippurin
 - Blood vessels in Pheretima, which have valves are
a) dorsal b) ventral c) supra-oesophageal d) lateral oesophageal.
 - Consider the following statements (i) - (iii), each with two blanks.
(i) Pseudostratified epithelium lines the (1) tract while transitional epithelium lines the (2) tract.
(ii) Lacunae of bones house (3) while lacunae of cartilage contain (4).
(iii) Tendon contains bundles of (5) fibres and rows of (6) cells between them.
Which one of the following options, gives the correct fill ups for the respective blank numbers from (1) to (6) in the statements?

- a) (1)-respiratory, (2)-urinary, (5)-white, (6)-fibroblast
b) (1)-urinary, (2)-respiratory, (3)-osteocytes, (4)-chondrocytes
c) (3)-chondrocytes, (4)-osteocytes, (5)-yellow, (6)-fibroblast
d) (3)-chondrocytes, (4)-osteocytes, (5)-yellow, (6)-fibroblast
6. Stratum germinativum is an example of which kind of epithelium?
a) Cuboidal b) Ciliated c) Columnar d) Squamous
7. **Assertion:** There is hepatic portal system in frogs.
Reason : It is venous connection between liver and intestine in frog.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false.c
8. Which of the following statements is correct about excretion in earthworm?
(i) Earthworm is mainly ureotelic.
(ii) Septal nephridia, present on both sides of intersegmental septa of segment 15 to the last, open into intestine.
(iii) Integumentary nephridia, attached to lining of body wall of segment 3 to the last, open on the body surface.
(iv) Different types of nephridia are basically similar in structure.
(v) Nephridia regulate the volume and composition of body fluids.
a) (i) and (iv) b) (iv) and (v) c) (i), (ii), (iii) d) All of these
9. Read the following statements (P - T) and select the option that correctly fills (i) - (v).
P. The male frog has a special organ on the throat called (i).
Q. (ii) membrane is a part of ear and serves to receive sound waves.
R. Dermis of the frog contains sac-like (iii) glands.
S. Tongue of frog is (iv).
T. (v) respiration takes place in lungs on land.
- a) (i) - vocal sac, (ii) - Plasma, (iii) - mucous, (iv) trilobed, (v) Pulmonary
b) (i) - vocal sac, (ii) - Tympanic, (iii) - mucous, (iv) bilobed, (v) Pulmonary
c) (i) - vocal sac, (ii) - Pleural, (iii) - mucous, (iv) unilobed, (v) Pulmonary
d) (i) - vocal sac, (ii) - Incus, (iii) - sweat, (iv) multilobed, (v) Pulmonary

10. Frog's heart when taken out of the body continues to beat for sometime. Select the best option from the following statements.
- (A) Frog is a poikilotherm.
(B) Frog does not have any coronary circulation.
(C) Heart is 'myogenic' in nature.
(D) Heart is autoexcitable
- Options:
a) only (D) b) (A) and (B) c) (C) and (D) d) only (C)
11. In frog, mesorchium is a thin fold of membrane extending between
a) two testes b) liver and kidneys c) two kidneys d) kidneys and testes.
12. The type of epithelial cells which line the inner surface of Fallopian tubes, bronchioles and small bronchi are known as
a) squamous epithelium b) columnar epithelium c) ciliated epithelium
d) cubical epithelium.
13. Which of the following statements is/are false about columnar epithelium?
- (i) It is made of tall and slender cells.
(ii) Free surface may have microvilli.
(iii) They are found in stomach and intestine and help in secretion and absorption.
(iv) Ciliated epithelium is mainly present in hollow structures like bronchioles and Fallopian tubes.
(v) They have apical nuclei.
- a) (i) only b) (v) only c) (ii) and (iv) d) (ii) and (iii)
14. Nervous tissue is made up of neurons and neuroglial cells. Which of the following statements about these two cells is/are false?
- (i) Neuroglia make up more than one-half the volume of neural tissue in our body.
(ii) Neuroglia protect and support neurons.
(iii) When a neuron is suitably stimulated, an electrical disturbance is generated which swiftly travels along its cytosol.
(iv) Arrival of the disturbance at the neuron's endings triggers stimulation or inhibition of adjacent neurons or other cells.
- a) (i) and (iv) b) (ii) and (iii) c) (iii) only d) (iv) only
15. Epithelial tissue with thin flat cells appearing like packed tiles occurs on _____.
- a) Inner lining of cheek b) Inner lining of stomach
c) Inner lining of Fallopian tubes d) Inner lining of ovary

16. Consider the following statements (i) - (iii), each with one or two blanks.
- (i) Bones have a hard and non-pliable ground substance (1) and (2) which give bone its strength.
 - (ii) Some of the columnar or cuboidal cells get specialised for secretion and are called (3) epithelium.
 - (iii) (4) junctions help to stop substances from leaking across a tissue.
- Which one of the following options, gives the correct fill ups for the respective blanks from (1) to (4) in the statements?
- a) (3)-glandular, (4)-Tight
 - b) (1)-calcium salts, (2)-collagen fibres, (3)-compound, (4) - Excretory
 - c) (3)-glandular, (4)-Adhering
 - d) (1)-magnesium salts, (2)-elastic fibres, (3)-compound
17. The lateral hearts in earthworm
- a) are situated in segments 7 and 9
 - b) are situated in segments 6 and 8
 - c) are situated in segments 8 and 10
 - d) are situated in segments 6 and 11.
18. Read the statements regarding frog. Which of the statements is/are correct and incorrect?
- (i) The medulla oblongata passes out through foramen of Monro and continues into spinal cord.
 - (ii) Vasa efferentia are 10-12 in number that arise from testes.
 - (iii) Ovaries have no functional connection with kidneys.
 - (iv) Frogs are uricotelic.
- a) Statements (i), (ii) and (iii) are correct while statement (iv) is incorrect.
 - b) Statements (i) and (ii) are correct while statements (iii) and (iv) are incorrect.
 - c) Statements (ii) and (iii) are correct while statements (i) and (iv) are incorrect.
 - d) Statements (ii), (iii) and (iv) are correct while statement (i) is incorrect.
19. About how many times does the nymph of the *Periplaneta americana* undergo moulting before becoming an adult?
- a) 4
 - b) 2
 - c) 17
 - d) 13
20. Frogs differ from humans in possessing:
- a) Paired cerebral hemispheres
 - b) Hepatic portal system
 - c) Nucleated RBCs
 - d) Thyroid

21. The hind brain in frog consists of
 a) cerebellum b) medulla oblongata c) diencephalon d) Both (a) and (b)
22. The kind of tissue that forms the supportive structure in our pinna (external ears) is also found in:
 a) Nails b) Ear ossicles c) Tip of the nose d) Vertebrae
23. Pick the odd one in each series and select the correct option.
 (i) Areolar tissue, blood, neuron, tendon
 (ii) Salivary gland, gastric gland, tear gland, thyroid gland
 (iii) Adrenal gland, sweat gland, milk gland, oil gland
- a)

(i)	(ii)	(iii)
Areolar tissue	Gastric gland	Milk gland
- b)

(i)	(ii)	(iii)
Blood	Tear gland	Oil gland
- c)

(i)	(ii)	(iii)
Tendon	Salivary gland	Sweat gland
- d)

(i)	(ii)	(iii)
Neuron	Thyroid gland	Adrenal gland
24. Match column I with column II and select the correct option from the codes given below.
- | Column - I | Column - II |
|------------------------|----------------------------------|
| A. Hyaline cartilage | (i) Pectoral girdle of frog |
| B. Fibrous cartilage | (ii) Long bones, sternum, ribs |
| C. Elastic cartilage | (iii) Pubic symphysis |
| D. Calcified cartilage | (iv) Eustachian tube, epiglottis |
- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(ii), B-(iii), C-(iv), D-(i)
 c) A-(ii), B-(iii), C-(iv), D-(i) d) A-(iv), B-(iii), C-(ii), D-(i)
25. Choose the correctly matched pair:
 a) Tendon-Specialised connective tissue
 b) Adipose tissue- Dense connective tissue
 c) Areolar tissue - Loose connective tissue
 d) Cartilage-Loose connective tissue
26. Which of the following is a wrongly matched pair?
 a) Unicellular glandular cells - Goblet cell b) Saliva - Exocrine secretion
 c) Fusiform fibres - Smooth muscle d) Cartilage - Areolar tissue
27. Which cartilage is present at the end of long bones?
 a) Calcified cartilage b) Hyaline cartilage c) Elastic cartilage
 d) Fibrous cartilage

28. Which one of the following statements is true for cockroach?

- a) The number of ovarioles in each ovary are ten
- b) The larval stage is called caterpillar.
- c) Anal styles are absent in females
- d) They are ureotelic.

29. **Assertion:** Cockroach shows sexual dimorphism.

Reason : The female cockroach bears a pair of short thread like anal styles.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

30. In the given diagram of the reproductive system of earthworm, identify parts labelled as A, B, C, D, E and select the correct option.



a)

A	B	C	D	E
Seminal vesicle	Spermathecae	Prostate gland	Ovary	Accessory gland

b)

A	B	C	D	E
Seminal vesicle	Ovary	Accessory gland	Spermathecae	Prostate gland

c)

A	B	C	D	E
Spermathecae	Seminal vesicle	Accessory gland	Ovary	Prostate gland

d)

A	B	C	D	E
Spermathecae	Seminal vesicle	Ovary	Accessory gland	Prostate gland

31. **Assertion :** Stomach and intestine of our body has columnar epithelium.

Reason : Columnar epithelium helps in secretion and absorption.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c)

If both assertion and reason are true but reason is not the correct explanation of assertion.

d) If both assertion and reason are false.

32. Consider the following four statements (i) - (iv) and select the correct option stating which ones are true (T) and which ones are false (F).

(i) In male cockroach, genital pouch or chamber lies at the hind end of abdomen bounded dorsally by 9th and 10th terga and ventrally by the 9th sternum.

(ii) In cockroach, the haemolymph is composed of colourless plasma and haemocytes.

(iii) In female cockroach each ovary is formed of a group of ten ovarian tubules or ovarioles, containing a chain of developing ova.

(iv) In cockroach the nymph grows by moulting about 13 times to reach the adult form.

a)

(i)	(ii)	(iii)	(iv)
F	T	F	T

b)

(i)	(ii)	(iii)	(iv)
F	F	T	T

c)

(i)	(ii)	(iii)	(iv)
T	T	F	T

d)

(i)	(ii)	(iii)	(iv)
T	F	T	F

33. Histamine secreting cells are found in _____.

a) Connective tissue b) Lungs c) Muscular tissue d) Nervous tissue

34. Which of the following statements is correct about the respiration in frog?

(i) In frog, cutaneous and pulmonary respiration are found.

(ii) A pair of elongated pink hollow lungs are found in thorax.

(iii) During aestivation and hibernation, gaseous exchange takes place through skin.

a) (i), (ii) and (iii) b) (i) and (iii) c) (ii) and (iii) d) (i) and (ii)

35. Which of the following is a transparent tissue?

a) Tendon b) Fibrous cartilage c) Hyaline cartilage d) All of these

36. Which of the following is correctly stated as it happens in the common cockroach?
- Malpighian tubules are excretory organs projecting out from the colon.
 - Oxygen is transported by haemoglobin in blood.
 - Nitrogenous excretory product is urea.
 - The food is grind by mandibles and gizzard.
37. Which of the following happens in the common cockroach?
- Malpighian tubules are excretory organs projecting out from the colon
 - Oxygen is transported by haemoglobin in blood
 - Nitrogenous excretory product is urea
 - The food is grounded by mandibles and gizzard
38. Which one of the following types of cell is involved in making of the inner walls of large blood vessels?
- Cuboidal epithelium
 - Columnar epithelium
 - Squamous epithelium
 - Stratified epithelium
39. Which type of tissue is correctly matched with its location?
- | Tissue | Location |
|----------------|----------|
| Areolar tissue | Tendons |
 - | Tissue | Location |
|-------------------------|-------------|
| Transitional epithelium | Tip of nose |
 - | Tissue | Location |
|---------------------|-------------------|
| Cuboidal epithelium | Lining of stomach |
 - | Tissue | Location |
|---------------|-------------------|
| Smooth muscle | Wall of intestine |
40. Which of the following statements about cell junctions are correct?
- All the cells of the epithelium are held together with little intercellular materials.
 - In almost all animal tissues specialised junctions provide both structural and functional link between their individual cells.
 - Tight junctions prevent substances from leaking across a tissue.
 - Adhering junctions provide cementing to keep neighbouring cells together.
 - Gap junctions provide cytoplasmic channels between cells for passage of ions, small molecules and sometimes big molecules.
- (ii) and (iii)
 - (i), (ii) and (iii)
 - (iv) and (v)
 - (i), (ii), (iii), (iv) and (v)
41. Choose the incorrect pair from the matches given below.

- a) Antennae - Sensory receptors b) Metathoracic wings - Flying
c) Malpighian tubule - Excretion d) Crop - Food grinding

42. Read the following statements and select the correct option.

Statement 1 : Bone and cartilage are rigid connective tissues.

Statement 2 : Blood is a connective tissue with fluid (plasma) matrix.

- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

43. **Assertion:** Tendons attach one bone to another bone.

Reason: Ligaments attach skeletal muscles to bones.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

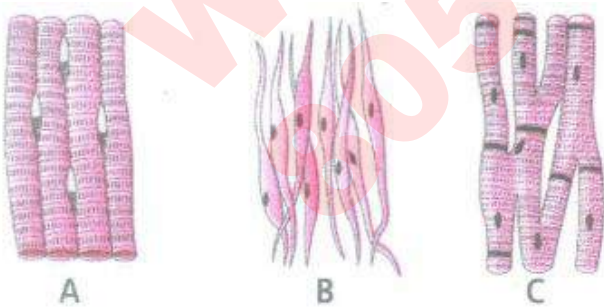
b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

44. Identify the figures A, B, C showing different types of muscle and select the correct option.



a)

A	B	C
Smooth muscle	Striated muscle	Cardiac muscle

b)

A	B	C
Cardiac muscle	Smooth muscle	Striated muscle

c)

A	B	C
Striated muscle	Smooth muscle	Cardiac muscle

d)

A	B	C
Involuntary muscle	Voluntary muscle	Heart muscle

45. Identify the following simple epithelial tissues and select the correct option.



46. In cockroach, the ootheca is formed by the secretion of
a) phallic gland b) collateral gland c) mushroom gland
d) conglobate gland.
47. What external changes are visible after the last moult of a cockroach nymph?
a) Mandibles become harder b) Anal cerci develops
c) Both fore and hind wings develop d) Labium develops
48. Formation of cartilage bones involves.
a)
Deposition of bony matter by osteoblasts and resorption by chondroclasts
b)
Deposition of bony matter by osteoclasts and resorption by chondroblasts
c) Only deposition of bony matter by osteolasts only
d) Deposition of bony matter by osteoblasts only
49. Which one of the following statements is correct regarding cockroach?
a) Head is oval in shape.
b)
There are 10 pairs of spiracles (2 pairs on thorax and 8 pairs on abdomen).
c)
Heart is differentiated into funnel shaped chambers with setae on either side.
d) Each eye consists of about 1000 hexagonal ommatidia.
50. Cardiac muscle cells differ from striated muscle cells in having
a) a centrally located nucleus b) different myofibrils
c) fewer mitochondria d) no sarcoplasmic reticulum.
51. Which of the following is incorrect for Pheretima



- a) Genital papillae are present on 17th and 19th segment.
b) Male genital pores are present on 18th segment.
c) Clitellum is present on segments 24, 25 and 26.
d) Segments of earthworm are called somites.

52. Given is the diagrammatic sketch of a certain type of connective tissue. Identify the parts labelled as A, B, C and D and select the correct option.



a)

A	B	C	D
Macrophage	Fibroblast	Collagen fibres	Mast cell

b)

A	B	C	D
Mast cell	Macrophage	Fibroblast	Collagen fibre

c)

A	B	C	D
Macrophage	Collagen fibre	Fibroblast	Mast cell

d)

A	B	C	D
Mast cell	Collagen fibre	Fibroblast	Macrophage

53. Characteristics of smooth muscle fibres are _____.

- Spindle-shaped, unbranched, unstriated, uninucleate and involuntary
- Spindle-shaped, unbranched, unstriped, multinucleate and involuntary
- Cylindrical, unbranched, unstriped, multinucleate and involuntary
- cylindrical, unbranched, unstriated, multinucleate and voluntary

54. **Assertion:** Smooth muscles are known as involuntary muscles.

Reason : Smooth muscles are controlled by autonomic nervous system.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

55. In a frog, if a hole is punched in the floor of its buccal cavity, then the frog will not die as

- buccal respiration does not stop
- pulmonary respiration occurs
- it can store oxygen for future use

d) respiration other than lungs will continue

56. Refer to the given figures showing two types of glands



Which of the following statements regarding these glands is not correct?

a)

These are the multicellular glands which pour their secretions directly through ducts at the site of action.

b) Sebaceous glands present in human skin are 'P' type of glands

c)

Brunner's glands of human intestine and sweat glands of human skin are 'Q' type of glands.

d)

In 'P' type of glands, secretory portion comprises of flask like structure where in 'Q' type of glands, secretory portion is both tubular and flask shaped.

57. The amnion of mammalian embryo is derived from _____ .

a) Mesoderm and trophoblast b) Endoderm and mesoderm

c) Ectoderm and mesoderm d) Ectoderm and endoderm

58. Consider the following four statements (i) - (iv) and select the correct option stating which ones are true (T) and which ones are false (F).

(i) The epithelium of proximal convoluted tubule (PCT) of nephron in the kidney has microvilli.

(ii) Simple epithelium covers the dry surface of the skin, the moist surface of buccal cavity, pharynx, inner lining of ducts of salivary glands and of pancreatic ducts.

(iii) The wall of internal organs such as the blood vessels, stomach and intestine contains skeletal muscle.

(iv) Bone marrow in some bones is the site of production of blood cells.

a)

(i)	(ii)	(iii)	(iv)
T	F	F	T

b)

(i)	(ii)	(iii)	(iv)
F	F	T	T

c)

(i)	(ii)	(iii)	(iv)
T	T	F	F

d)

(i)	(ii)	(iii)	(iv)
T	F	T	F

59. Select the correct route for the passage of sperms in male frogs.

a)

Testes → Bidder's canal → Kidney → Vasa → efferentia → Urinogenital duct → Cloaca

b)

Testes → Vasa efferentia → Kidney → Seminal Vesicles → Urinogenital duct → cloaca

c) Testes → Vasa efferentia → Bidder's canal → Ureter → Cloaca

d)

Testes → Vasa efferentia → Kidney-Bidder's canal → Urinogenital duct → Cloaca

60. In male cockroaches, sperms are stored in which part of the reproductive system?

a) Seminal vesicles b) Mushroom glands c) Testes d) Vas deferens

61. Four healthy people in their twenties got involved in injuries resulting in damage and death of a few cells of the following which of the cells are least likely to be replaced by new cells?

a) Osteocytes b) Malpighian layer of skin c) Liver cells d) Neurons

62. Which one of the following has an open circulatory system?

a) Pheretima b) Periplaneta c) Hirudinaria d) Octopus

63. Which of the following is correct for the common cockroach?

a) Malpighian tubules are excretory organs projecting out from the colon.
b) Oxygen is transported by haemoglobin in blood.
c) Nitrogenous excretory product is urea.
d) The food is grinded by mandibles and gizzard.

64. Which one of the following characteristics is common both in humans and adult frogs?.

a) Ureotelic mode of excretion b) Four-chambered heart
c) Internal fertilisation d) Nucleated RBCs.

65. Which cells do not form layer and remain structurally separate?

a) Epithelial cells b) Muscle cells c) Nerve cells d) Gland cells

66. Which of the following cells do not form layer and remain structurally separate?

a) Epithelial cells b) Muscle cells c) Nerve cells d) Gland cells

67. 'Mummies' of Egypt still have their arteries preserved due to the presence of

a) yellow elastic connective tissue fibres

b) white fibrous connective tissue fibres c) cartilage d) valves.

68. Read the following four statements (i) - (iv) having certain mistakes in two of them.

(i) Adipose tissue is a type of dense connective tissue located beneath the skin.

(ii) Compound epithelium has extensive role in absorption and secretion.

(iii) Most of the cartilages in vertebrate embryos are replaced by bones in adults.

(iv) Smooth muscles are 'involuntary' as their functioning cannot be directly controlled.

Which of the above statements have mistakes?

a) (ii) and (iii) b) (iii) and (iv) c) (i) and (iii) d) (i) and (ii)

69. Blood brain barrier in adults have _____ junctions between cells.

a) tight b) adhering c) gap d) none of these

70. In the mouth parts of a cockroach, the labium forms (i), while (ii) acts as a tongue.

a) (i) - upper lip; (ii) - maxilla b) (i) - upper lip; (ii) - hypopharynx

c) (i) - lower lip; (ii) - maxilla d) (i) - lower lip; (ii) - hypopharynx

71. Enzyme collagenase breaks the peptide bonds present in collagen protein. Excessive secretion of this enzyme will lead to weakening of which of the following body parts?

(i) Tendons, (ii) Bones, (iii) Hair shafts, (iv) Nails and claws, (v) Intervertebral discs

a) (iii) and (iv) b) (ii), (iii) and (v) c) (i), (ii) and (iii) d) (i), (ii) and (v)

72. Cuboidal epithelium with brush border of microvilli is found in:

a) Proximal convoluted tubule of nephron b) Eustachian tube

c) Lining of intestine d) Ducts of salivary glands

73. Read the given paragraph.

"It is lined by glandular and ciliated cells. It absorbs nitrogenous waste products from haemocoel and convert them into uric acid which is excreted out through the hindgut."

Which of the following structures of cockroach is referred here?

a) Trachea b) Hepatic caecum c) Tergum d) Malpighian tubule

74. The ciliated columnar epithelial cells in humans are known to occur in:

- a) Fallopian tubes and urethra b) Eustachian tube and stomach lining
c) Bronchioles and fallopian tubes d) Bile duct and oesophagus
75. Goblet cells of alimentary canal are modified from:
a) Chondrocytes b) Compound epithelial cells
c) Squamous epithelial cells d) Columnar epithelial cells
76. The functional unit of contractile system in striated muscle is _____ .
a) Myofibril b) Sarcomere c) Z-lines d) Cross bridges
77. Setae help in locomotion in earthworm but are not uniformly present in all the segments. They are present in
a) 1st segment b) last segment c) clitellar segment
d) 20th - 22nd segment.
78. Earthworms are:
a) Ureotelic when plenty of water is available
b) Uricotelic when plenty of water is available
c) Uricotelic under conditions of water scarcity
d) Ammonotelic when plenty of water is available
79. Which one of the following structures in Pheretima is correctly matched with its function?
a) Clitellum - secretes cocoon b) Gizzard - absorbs digested food
c) Setae - defense against predators
d) Typhlosole - storage of extra nutrients
80. Pseudostratified epithelium is found in
a) rectum b) urinary bladder c) wall of oesophagus
d) inner lining of bronchiole.
81. Match the following and choose the correct option.
- | | | | |
|---|-------------------------|-------|-------------|
| A | Adipose tissue | (i) | Nose |
| B | Stratified epithelium | (ii) | Blood |
| C | Hyaline cartilage | (iii) | Skin |
| D | Fluid connective tissue | (iv) | Fat storage |
- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(iv), B-(iii), C-(i), D-(ii)
c) A-(iii), B-(i), C-(iv), D-(ii) d) A-(ii), B-(i), C-(iv), D-(iii)
82. **Assertion:** Excretion in cockroach occurs by Malpighian tubules.
Reason: Each Malpighian tubule is lined by non-ciliated columnar cells.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

83. Read the following statements about cockroach.

(i) In male cockroach, a characteristic mushroom shaped gland is present in the 6th - 7th abdominal segments which functions as an accessory reproductive gland.

(ii) Cockroach is uricotelic.

(iii) The fat body and uricose glands are glandular in function.

(iv) Blood from sinuses enter heart through ostia and is pumped anteriorly to sinuses again.

Which of the above statements are correct?

a) (i), (ii) and (iv) b) (ii) and (iii) c) (i) and (iv) d) (ii) and (iv)

84. Each thoracic segment of *Periplaneta americana* is enclosed by four

_____ skeletal sclerites : a dorsal _____, a ventral _____ and two lateral _____. The _____ of the prothorax is also called pronotum, which covers the neck and a part of the head.

Complete the above paragraph by selecting the correct sequence of words.

a) Chitinous, tergum, sternum, pleura, tergum

b) Proteinaceous, sternum, tergum, pleura, tergum

c) Chitinous, sternum, tergum, pleura, sternum

d) Proteinaceous, tergum, pleuron, sternum, tergum

85. Male cockroach differs from female cockroach in having

a) antennae b) labrum c) maxillae d) anal styles.

86. One very special feature in the earthworm *Pheretima* is that

_____.

a) Fertilisation for eggs occurs inside the body

b)

The typhlosole greatly increases the effective absorption area of the digested food in the intestine.

c)

The S-shaped setae embedded in the integument are the defensive weapons used against the enemies.

d) It has a long dorsal tubular heart.

87. The epithelial tissue present on the inner surface of bronchioles and fallopian tube is:

a) Glandular b) Ciliated c) Squamous d) Cuboidal

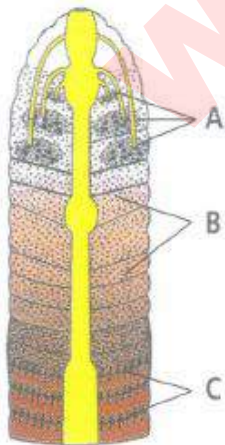
88. Which of the following features is used to identity a male cockroach from a female cockroach?

a) Forewings with darker tegmina b) Presence of caudal styles
c) Presence of boat shaped sternum on the 9th abdominal of anal cerci
d) Presence of anal cerci

89. Identify the incorrect statement about frog.

a) Parathyroid and pineal body are present.
b) There are ten cranial nerves only.
c) Optic lobes are situated in the mid brain.
d) The ventricle opens into the conus arteriosus.

90. The figure showing nephridial system of earthworm is given here. Identify the types of nephridia labelled as A, B and C from the list (i) to (iii) given below and select the correct option.



(i) Septal nephridia

(ii) Integumentary nephridia

(iii) Tufts of pharyngeal nephridia

a)

A	B	C
(ii)	(i)	(iii)

b)

A	B	C
(iii)	(ii)	(i)

c)

A	B	C
(ii)	(iii)	(i)

d)

A	B	C
(i)	(ii)	(iii)

91. The function of the gap junction is to :

- a) Perform cementing to keep neighbouring cells together
b)
Facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules
c) Separate two cells from each other
d) Stop substance from leaking across a tissue
92. The terga, sterna and pleura of cockroach body are joined by :
a) Cartilage b) Cementing glue c) Muscular Tissue
d) Arthrodial membrane
93. **Assertion:** Setae are absent in clitellum.
Reason: Setae help in locomotion.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
94. Cartilage is formed by
a) chondrocytes b) osteoblasts c) osteoclasts d) fibroblasts.
95. Cardiac muscles are different from skeletal muscles as they are
a) smooth b) voluntary c) non-striated d) involuntary.
96. Read the following statements regarding different types of animal tissues and select the incorrect ones.
(i) Each fasciculus (or bundle of muscle fibres) is surrounded by an epithelial tissue covering called perimysium.
(ii) Multi unit smooth muscles are present in ciliary and iris muscles in the eyes and muscles of the walls of large blood vessels.
(iii) Columnar epithelium present in gastric glands, intestinal glands and pancreatic lobules, has a secretory role and is called as glandular epithelium.
(iv) Epithelial tissue arises only from the ectoderm of embryo and is usually supplied with blood vessels.
a) (i) and (iii) b) (ii) and (iii) c) (ii) and (iv) d) (i) and (iv)

97. Smooth muscles are:
- a) involuntary, fusiform, non-striated b) voluntary, multinucleate, cylindrical
 - c) involuntary, cylindrical, striated
 - d) voluntary, spindle-shaped, uninucleate
98. Which of the following statements is correct regarding cockroach?
- a) It possesses ventral nerve cord. b) Its spiracles help in excretion.
 - c) Phallomere is present in female cockroach.
 - d) Compound eye is also called as ocellus.
99. Compared to those of humans, the erythrocytes in frog are _____ .
- a) Without nucleus but with haemoglobin
 - b) Nucleated and with haemoglobin c) Very much smaller and fewer
 - d) Nucleated and without haemoglobin.
100. Which of the following statements is incorrect about the frog?
- (i) Eyes are bulged out and covered by a nictitating membrane that protects them while in water.
 - (ii) On either side of the eyes a membranous tympanum (ear) receives sound signals.
 - (iii) The hind limbs end in four digits and they are larger and muscular than fore limbs that end in five digits.
 - (iv) Feet have webbed digits that help in swimming.
 - (v) Frogs exhibit sexual dimorphism.
- a) (i) and (v) b) (iii) only c) (ii) and (iii) d) (iv) only
101. Simple cuboidal epithelium lines all the following structures except the
- a) ovary b) pancreatic ducts c) thyroid follicles d) Fallopian tube.
102. Cloaca is a small, median chamber that is used to pass
- a) faecal matter b) urine c) sperms d) all of these.
103. Which of the following layers you will find in the body wall of earthworm (from outside to inside)?
- a)
Non-cellular cuticle, epidermis, circular muscles, longitudinal muscles, coelomic epithelium
 - b)
Cuticle, epidermis, longitudinal muscles, circular muscles, coelomic epithelium

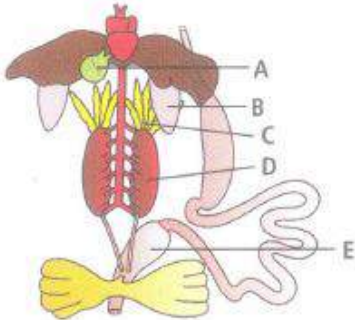
c)

Non-cellular cuticle, epidermis, coelomic epithelium, circular muscles, longitudinal muscles

d) Cuticle, epidermis, peritoneal muscles

04. The figure given here shows diagrammatic representation of internal organs of frog.

Identify A to E and select the correct option



a)

A	B	C	D	E
Gall bladder	Liver	Ovary	Testis	Rectum

b)

A	B	C	D	E
Liver	Pancreas	Fat bodies	Testis	Gall bladder

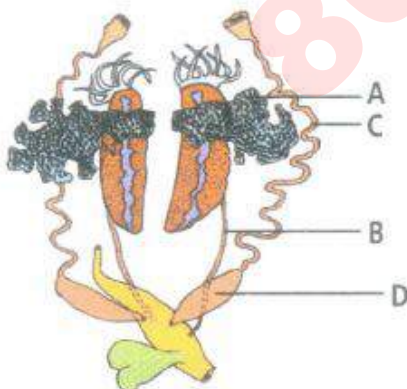
c)

A	B	C	D	E
Pancreas	Lung	Testis	Kidney	Liver

d)

A	B	C	D	E
Gall bladder	Lung	Fat bodies	Kidney	Rectum

05. The figure given here is related with female reproductive system of frog. Identify the parts labelled as A to D.



a)

A	B	C	D
Ovary	Ureter	Oviduct	Ovisac

b)

A	B	C	D
Ovisac	Urinogenital duct	Bidder's canal	Ovary

c)

A	B	C	D
Ovary	Urinogenital duct	Ovisac	Oviduct

d)

A	B	C	D
Ovisac	Urinogenital duct	Bidder's canal	Oviduct

06. One very special feature in the earthworm is that

a) fertilisation of eggs occurs inside the body

b) the typhlosole greatly increases the effective absorption area of intestine

c)

the S-shaped setae embedded in the integument are the defensive weapons used against the enemies

d) it has a long dorsal tubular heart.

07. **Assertion:** Cell junctions are present in the epithelium and other tissues.

Reason: Among cell junctions, adhering junctions help to stop substances from leaking across a tissue.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

08. Which of the following structures is correctly matched with its description?

a) Septal nephridia and pharyngeal nephridia - Both are exonephric

b) Typhlosole - Helps in grinding the soil particles and decaying leaves.

c) Sensory system - Possesses light and touch receptors in earthworm

d)

Gizzard - Internal median fold present in the dorsal wall of the intestine of earthworm

09. To which one of the following categories does adipose tissue belong?

a) Epithelial b) Connective c) Muscular d) Neural

110. One very special feature in the earthworm (Pheretima) is that:

a) Fertilization of eggs occurs inside the body

b)

The typhlosole greatly increases the effective absorption area of the digested food in the intestine

c)

The S-shaped setae embedded in the integument are the defensive weapons used against the enemies

d) It has a long dorsal tubular heart

111. **Assertion:** The cells of connective tissues except blood secrete fibres.

Reason: Fibres provide strength, elasticity and flexibility to the tissue.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

112. Consider the following statements (i)-(iii) and select the correct option stating which ones are true (T) and which ones are false (F).

(i) Keratinised stratified squamous epithelium covers moist surfaces like buccal cavity.

(ii) Fibroblasts store fat in adipose tissue.

(iii) Urinary bladder is lined by a stratified epithelium.

a)

b)

c)

d)

(i)	(ii)	(iii)
F	T	T

(i)	(ii)	(iii)
T	F	F

(i)	(ii)	(iii)
T	F	T

(i)	(ii)	(iii)
T	T	F

113. Which of the following is not a connective tissue?

a) Bone b) Cartilage c) Blood d) Muscles

114. Select the correct statement from the ones given below with respect to Periplaneta americana.

a)

Nervous system located dorsally, consists of segmentally arranged ganglia joined by a pair of longitudinal connectives.

b) Males bear a pair of short thread like anal styles.

c)

There are 16 very long Malpighian tubules present at the junctions of midgut and hindgut.

d) Grinding of food is carried out only by the mouth parts.

15. Which one of the following is correct pairing of a body part with the kind of muscle tissue present in it?

a) Biceps of upper arm - Smooth muscle fibres

b) Abdominal wall Voluntary smooth muscle

c) Iris - Involuntary smooth muscle

d) Heart wall - Involuntary unstriated muscle

16. **Assertion** : Connective tissues are the most abundant and widely distributed in the body of complex animals.

Reason : Connective tissues link and support other tissues or organs of the body.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false

17. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Vermicomposting	(i) Ectonephric
B. Pharyngeal nephridia	(ii) Locomotion
C. Integumentary nephridia	(iii) Earthworm
D. Setae	(iv) Enteronephric
E. Spermathecae	(v) Store spermatozoa

a) A-(iii), B-(iv), C-(i), D-(ii), E-(v) b) A-(v), B-(i), C-(iv), D-(ii), E-(iii)

c) A-(iii), B-(ii), C-(iv), D-(i), E-(v) d) A-(iii), B-(v), C-(i), D-(iv), E-(ii)

18. Which of the following is not exclusively supplied with involuntary muscles?

a) Muscular coats of blood vessels b) Muscles of the ducts of glands

c) Muscles of iris d) Muscles of urethra

19. Read the following statements and select the correct option.

Statement 1 : Cardiac muscle of the heart is striated and has intercalated discs between its fibres (cells).

Statement 2 : It provides quick, powerful and rhythmic contractions to the heart.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

20. Read the following statements and select the correct option.

(i) Blood cells secrete fibres of structural proteins called collagen and elastin.

(ii) Neuroglial cells protect and support the nephrons.

(iii) Osteocytes are present in spaces called lacunae.

(iv) Striated muscle fibres are bundled together in a parallel fashion.

(v) Biceps are involuntary and striated.

- a) Statements (iii) and (iv) are incorrect.
- b) Statements (ii) and (iv) are incorrect.
- c) Statements (i) and (iii) are incorrect.
- d) Statements (i), (ii) and (v) are incorrect.

21. Match the followings and choose the correct answer.

A. Touch	(i)	Nasal epithelium
B. Smell	(ii)	Foramen magnum
C. Cranial nerves	(iii)	Sensory papillae
D. Medulla oblongata	(iv)	Peripheral nervous System

- a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(ii), B-(i), C-(iv), D-(iii)
- c) A-(iii), B-(iv), C-(ii), D-(i) d) A-(iii), B-(i), C-(iv), D-(ii)

22. Lining of intestine of man is

- a) brush bordered b) ciliated c) non-keratinised d) keratinised.

23. The body cells in cockroach discharge their nitrogenous waste in the haemolymph mainly in the form of :

- a) Calcium carbonate b) Ammonia c) Potassium urate d) Urea

24. Where is jelly deposited as a covering on the egg of frog?

- a) In the oviduct b) In the water during fertilisation
- c) In the water after fertilisation d) In the ovary

25. Durtigan injury nasal septum gets damaged and for its recovery which cartilage is preferred?
a) Hyaline cartilage b) Elastic cartilage c) Calcified cartilage
d) Fibrous cartilage
26. Which one of the following features is not present in *Periplaneta americana*?
a) Indeterminate and radial cleavage during embryonic development
b) Exoskeleton composed of N-acetylglucosamine
c) Metamerically segmented body d) Schizocoelom as body cavity
27. Primary function of enteronephric nephridia of *Pheretima* is:
a) osmoregulation b) excretion of nitrogenous wastes c) respiration
d) locomotion.
28. Match column I with column II and select the correct option from the codes given below.

Column - I	Column - II
A. Pseudostratified epithelium	(i) Connective tissue
B. Matrix	(ii) Absorption
C. Striated myofibril	(iii) Trachea
D. Mesothelium	(iv) Body cavity lining
E. Microvilli	(v) Multinucleate

- a) A-(i), B-(ii), C-(iii), D-(iv), E-(v) b) A-(ii), B-(v), C-(iv), D-(i), E-(iii)
c) A-(iii), B-(i), C-(v), D-(iv), E-(ii) d) A-(iv), B-(iii), C-(v), D-(i), E-(ii)
29. The development of *Periplaneta americana* is
a) holometabolous b) paurometabolous c) ametabolous
d) hemimetabolous.
30. Which of the following statements is incorrect about the nervous system of earthworm?
a)
Nervous system is basically represented by ganglia arranged on ventral nerve cord.
b)
In 3rd and 4th segment, the nerve cord bifurcates and joins the cerebral ganglia dorsally to form a nerve ring.

c)

The cerebral ganglia alongwith other nerves in the ring integrate sensory input as well as command muscular responses of the body.

d) None of these

31. Uric acid is the chief nitrogenous component of the excretory products of:

a) Earthworm b) Cockroach c) Frog d) Man

32. Match column I with column II and select the correct option from the codes given below.

	Column I (Parts of alimentary canal of earthworm)		Column II (Respective segments)
A.	Buccalcavity	(i)	1-3
B	Pharynx	(ii)	3-4
C.	Oesophagus	(iii)	5-7
D.	Gizzard	(iv)	8-9
E.	Stomach	(v)	9-14
F.	Intestine	(vi)	15 to last
G.	Typhlosole	(vii)	26-35

a) A-(i), B-(ii), C-(iii), D-(iv), E-(v), F-(vi), G-(vii)

b) A-(i), B-(ii), C-(iii), D-(v), E-(iv), F-(vi), G-(vii)

c) A-(i), B-(iii), C-(ii), D-(iv), E-(v), F-(vii), G-(vi)

d) A-(i), B-(iii), C-(ii), D-(v), E-(iv), F-(vii), G-(vi)

33. Which one of the following pairs of structure distinguishes a nerve cell from other types of cell?

a) Flagellum and medullary sheath b) Nucleus and mitochondria

c) Perikaryon and dendrites d) Vacuoles and fibres

34. Which of the following statements is/are not correct regarding connective tissues?

(i) They are most abundant and widely distributed in the body of complex animals.

(ii) They connect and support other tissues.

(iii) They include diverse tissues such as bones, cartilage, tendons, adipose and other loose connective tissues.

(iv) They form the internal and external lining of many organs.

(v) In all connective tissues except blood, the cells secrete fibres of structural proteins like collagen and elastin.

a) (iv) only b) (v) only c) (i) and (ii) d) (iii) and (v)

35. In Pheretima, there are red coloured round bodies in 4th, 5th and 6th segments above the alimentary canal. They are believed to be involved in
a) respiration b) digestion c) reproduction d) leucocyte production.
36. Fill up the blanks in the following paragraph by selecting the correct option.
The vascular system of frog is well-developed (i). type. The blood vascular system involves heart, blood vessels and blood. Heart has 3 chambers, two atria and one ventricle and is covered by a membrane called (ii). A triangular structure called (iii) joins the right atrium.

a)

(i)	(ii)	(iii)
open	conus arteriosus	neurilemma

b)

(i)	(ii)	(iii)
closed	sinus venosus	pericardium

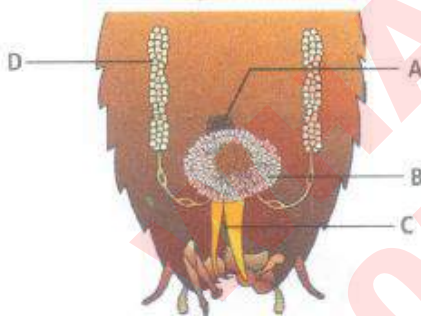
c)

(i)	(ii)	(iii)
open	neurilemma	conus arteriosus

d)

(i)	(ii)	(iii)
closed	pericardium	sinus venosus

37. Study the given figure of reproductive system of male cockroach. In which of the labelled parts are the sperms stored?



a) A b) B c) C d) D

38. Which one of the following contains the largest quantity of extracellular material?
a) Stratified epithelium b) Myelinated nerve fibres c) Striated muscle
d) Areolar tissue
39. Basement membrane is made up of _____.
a) Only epidermal cells b) Only endodermal cells c) Both (a) and (b)
d) No cell at all, but is a product of epithelial cells
40. Pheretima and its close relatives derive nourishment from:
a) Small pieces of fresh fallen leaves of maize, etc b) Sugarcane roots
c) Decaying fallen leaves and soil organic matter d) Oil insects
41. Match the following and choose the correct answer.

A. Hermaphrodite	(i)	Produces blood cells and haemoglobin
B. Direct development	(ii)	Testis and ovary in the same animal
C. Chemoreceptor	(iii)	Larval form absent
D. Blood gland in earthworm	(iv)	Sense of chemical substances

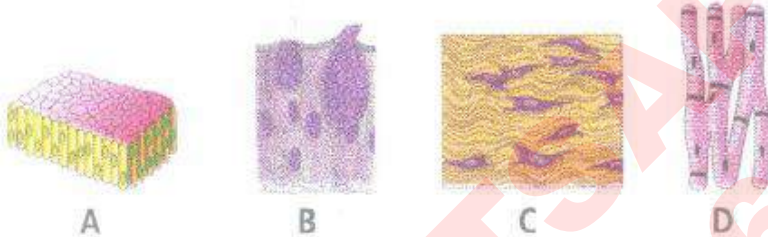
a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(iii), B-(ii), C-(iv), D-(i)

c) A-(i), B-(iii), C-(ii), D-(iv) d) A-(ii), B-(iv), C-(iii), D-(i)

42. If a live earthworm is pricked with a needle on its outer surface without damaging its gut, the fluid that comes out is:

a) Coelomic fluid b) Haemolymph c) Slimy mucus d) Excretory fluid

43. The four figures (A, B, C and D) given below represent four different types of animal tissues. Which one of these is correctly identified in the given options along with its correct location and function?



a)

Tissue	location	Function
B-Glandular epithelium	Intestine	Secretion

b)

Tissue	location	Function
C-Collagen fibres	Cartilage	Attach bone to bone

c)

Tissue	location	Function
D - Smooth muscle tissue	Heart	Heart contraction

d)

Tissue	location	Function
A - Columnar epithelium	Nephron	Secretion and absorption

44. Match the following with reference to cockroach and choose the correct option.

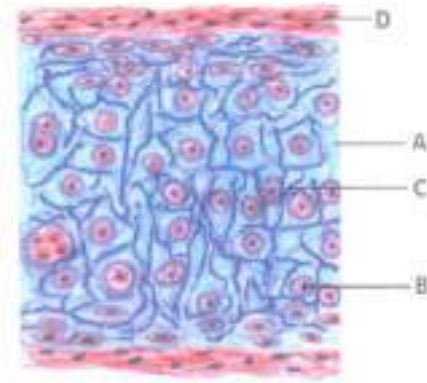
A. Phallomere	(i)	Chain of developing ova
B. Gonopore	(ii)	Bundles of sperm
C. Spermatophore	(iii)	Opening of the ejaculatory duct
D. Ovarioles	(iv)	The external genitalia

- a) A-(iii), B-(iv), C-(ii), D-(i) b) A-(iv), B-(iii), C-(ii), D-(i)
 c) A-(iv), B-(ii), C-(iii), D-(i) d) A-(ii), B-(iv), C-(iii), D-(i)

45. Component of blood responsible for producing antibodies is _____

- a) Thrombocytes b) Monocytes c) Erythrocytes d) Lymphocytes

46. In the given diagram of a section of hyaline cartilage, the different parts have been indicated by alphabets. Choose the answer in which these alphabets correctly match with the parts they indicate.



a)

A	B	C	D
Perichondrium	Chondrocyte	Lacuna	Capsular matrix

b)

A	B	C	D
Blood vessel	Chondrocyte	Lacuna	Perichondrium

c)

A	B	C	D
Matrix	Chondrocyte	Lacuna	Perichondrium

d)

A	B	C	D
Matrix	Lacuna	Chondrocyte	Capsular matrix

47. Mammalian bone differs from cartilage in the presence of

- a) lymph vessels b) collagen c) blood vessels d) Haversian canals.

48. **Assertion:** Eggs of cockroach are encased in capsules called oothecae.

Reason: Ootheca is a dark reddish to blackish brown capsule.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

49. The supportive skeletal structures in the human external ears and in the nose tip are examples of :

a) Ligaments b) Areolar tissue c) Bone d) Cartilage

50. Haversian canal occurs in _____ .

a) Humerus b) Pubis c) Scapula d) Clavicle

51. The kind of epithelium which forms the inner walls of blood vessels is :

a) Cuboidal epithelium b) Columnar epithelium c) Ciliated epithelium
d) Squamous epithelium

52. Earthworms have no skeleton but during burrowing, the anterior end becomes turgid and acts as a hydraulic skeleton. It is due to

_____ .

a) Coelomic fluid b) Blood c) Gut peristalsis d) Setae

53. Mineral found in red pigment of vertebrate blood is _____ .

a) Magnesium b) Iron c) Calcium d) Copper

54. Given below are four statements (i) - (iv) each with two blanks. Select the option which correctly fills up the blanks in any two of these statements.

(i) The columnar epithelium is composed of (1) and slender cells. Their (2) are located at the base.

(ii) Collagen fibres provide (3) and elastin fibres provide (4) and elasticity to the tissue.

(iii) Adipose tissue is a (5) type of connective tissue located mainly beneath (6).

(iv) Tendons attach (7) to bones and ligaments attach (8) to bones.

a) (1) tall, (2) nuclei, (7) bones, (8) muscles

b) (1) short, (2) organelles, (3) strength, (4) flexibility

c) (3) strength, (4) flexibility, (5) loose, (6) skin

d) (5) dense, (6) muscles, (7) muscles, (8) bones

55. **Assertion:** Blood glands are present in earthworm.

Reason: Earthworm has an open type of blood vascular system.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

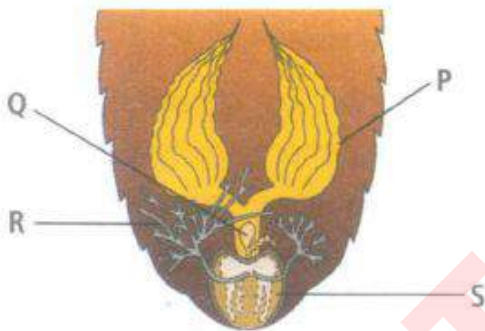
b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

56. Refer to the given figure showing reproductive system of female cockroach.



Identify the parts labelled as P, Q, R and S and select the correct statement regarding these

a)

P represents the ovary of female cockroach, which consists of six ovarioles, each containing a row of developing ova.

b)

Q represents the left spermatheca which stores the sperms received from male during copulation.

c)

R represents the right conglobate gland whose secretions serve to attract the male cockroach during mating

d)

S represents the gonapophyses whose secretion produces the egg case of ootheca.

57. Vitamin-K is required for _____ .

a) Formation of thromboplastin b) Conversion of fibrinogen to fibrin

c) Conversion of prothrombin to thrombin d) Synthesis of prothrombin

58. **Assertion:** Neurons protect and support the neuroglial cells.

Reason: Neuroglial cells make up ninety per cent neural tissue in our body.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

59. Read the following statements and select the correct option.

Statement 1 : Urinary bladder is lined by transitional epithelium.

Statement 2 : Transitional epithelium keeps the size of bladder constant at all time.

a) Both statements 1 and 2 are correct.

b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect.

60. Read the following statement having two blanks A and B. In cockroach, a ring of 6 - 8 blind tubules called (A) is present at the junction of foregut and midgut while at the junction of midgut and hindgut a ring of 100 - 150 yellow coloured thin filamentous (B) is present.

The one correct option that fills the two blanks is

a)

A	B
Malpighian tubules	hepatic caecae

b)

A	B
fat bodies	vasa efferentia

c)

A	B
hepatic caecae	Malpighian tubules

d)

A	B
vas deferens	fat bodies

61. In which one of the following preparations are you likely to come across cell junctions most frequently?

a) Thrombocytes b) Tendon c) Hyaline cartilage d) Ciliated epithelium.

62. The cell junctions called tight, adhering and gap junction are found in

_____ .
 a) Connective tissue b) Epithelial tissue c) Neural tissue
 d) Muscular tissue

63. **Assertion:** Earthworms are known as 'friends of farmers'.

Reason: Earthworms make burrows in the soil and make the soil porous, which helps in respiration and penetration of developing plant roots.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

64. If the head of cockroach is removed, it may live for few days because _____ .

a)

The head holds a small proportion of a nervous system while the rest is situated along the ventral part of its body.

b)

The head holds a $\frac{1}{3}$ rd of a nervous system while the rest is situated along the dorsal part of its body.

c)

The supra-oesophageal ganglia of the cockroach are situated in ventral part of abdomen.

d) The cockroach does not have nervous system.

65. Select the correct statement from the ones given below with respect to *Periplaneta americana*.

a)

Nervous system located dorsally consists of segmentally arranged ganglia joined by a pair of longitudinal connectives

b) Males bear a pair of short thread like anal styles

c)

There are 16 very long malpighian tubules present at the junctions of midgut and hindgut

d) Grinding of food is carried out only by the mouth parts

66. Following are given four statements (i) - (iv) related to frog. Read the statements carefully and select the option that identifies two correct statements.

- (i) The brain is divided into fore-brain, mid-brain and hind-brain.
- (ii) Vasa efferentia enter the kidneys on their side and open into Bidder's canal.
- (iii) Ear acts as a hearing organ only.
- (iv) RBCs are enucleated and contain red coloured pigment namely haemoglobin.

a) (ii) and (iii) b) (i) and (ii) c) (iii) and (iv) d) (i) and (iv)

67. Areolar connective tissue joins _____ .

- a) Integument with muscles b) Bones with muscles c) Bones with bones
d) Fat body with muscles

68. Read the following statements and select the correct ones.

- (i) In simple cuboidal epithelium, nuclei are rounded and lie in the centre of the cells.
- (ii) Non-keratinised epithelium is impermeable to water.
- (iii) Yellow elastic fibrocartilage makes cartilage flexible.
- (iv) Areolar tissue forms a shock absorbing cushion around the eye balls and kidneys.

a) (i) and (iii) b) (i) and (ii) c) (iii) and (iv) d) (ii) and (iv)

69. **Assertion:** The alimentary canal of the frog is short.

Reason: Frogs are carnivores.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

70. Which one of the following correctly describes the location of same body parts in the earthworm Pheretima?

a) Four pairs of spermathecae in 4-7 segments

b)

One pair of ovaries attached at inter segmental septum of 14th and 15th segments

c) Two pairs of testes in 10th and 11th segments

d) Two pairs of accessory glands in 16th -18th segments

**Ravi Maths Tuition Centre****Time : 1 Mins****CELL UNIT OF LIFE 1****Marks : 1108**

1. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
A.	Chloroplasts	(i)	Colourless plastids
B.	Chromoplasts	(ii)	Yellow, Orange or red coloured plastids
C.	Leucoplasts	(iii)	Green plastids

- a) A-(iii), B-(i), C-(ii) b) A-(iii), B-(ii), C-(i) c) A-(i), B-(iii), C-(ii)
d) A-(i), B-(ii), C-(iii)
2. Experiments on *Acetabularia* by Hammerling proved the role of _____ .
a) Cytoplasm in controlling differentiation b) Nucleus in heredity
c) Chromosomes in heredity d) Nucleocytoplasmic ratio
3. Which of the following is not a function of cytoskeleton in a cell?
a) Intracellular transport b) Maintenance of cell shape and structure
c) Support of the organelles d) Cell motility
4. The fluid mosaic model explains which aspects of a cell membrane?
a) Only structural aspects b) Only functional aspects
c) Both structural and functional aspects d) Only fluidity of membrane
5. Assertion : The content of inner compartment of mitochondria is called matrix.
Reason : The outer membrane forms a number of infoldings called cristae

- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false.
6. Who proposed the fluid mosaic model of plasma membrane?
a) Camillo Golgi b) Schleiden and Schwann c) Singer and Nicolson
d) Robert Brown
7. The function of rough endoplasmic reticulum is _____.
a) Fat synthesis b) Lipid synthesis c) Protein synthesis
d) Steroid synthesis
8. What is true about genetic material of a prokaryotic cell?
a) Lacks histones b) Not enveloped by nuclear membrane
c) Composed of a single circular DNA molecule d) All of these
9. Genes located on mitochondrial DNA _____.
a) Generally show maternal inheritance
b) Are always inherited from the male parent
c) Show biparental inheritance like the nuclear genes
d) Are not inherited
10. Chromatophores take part in :
a) Respiration b) Photosynthesis c) Growth d) Movement
11. A cell, which is very active in the synthesis and secretion of proteins, would be expected to have:
a) equal amount of RER and SER b) more SER than RER
c) more RER than SER d) more Golgi bodies and no ER
12. Plant cells differ from animal cells in having
a) cell wall b) plastids c) a large central vacuole d) all of these
13. Cell organelle responsible for autolysis is
a) dictyosome b) lysosome c) peroxisome d) glyoxysome.
14. Centromere is required for:

- a) Movement of chromosomes towards poles b) Cytoplasmic cleavage
c) Crossing over d) Transcription
15. Which of the following events does not occur in rough endoplasmic reticulum?
a) Cleavage of signal peptide b) Protein glycosylation
c) Protein folding d) Phospholipid synthesis
16. All plastids have essentially the same structure because
a) they have to perform the same function
b) they are localised in the aerial parts of plants
c)
one type of plastid can differentiate into another type of plastid depending upon the cell requirements
d) all plastids have to store starch, lipids and proteins.
17. Plasmodesmata are:
a) Locomotory structures
b) Membranes connecting the nucleus with plasmalemma
c) Connections between adjacent cells
d) Lignified cemented layers between cells
18. Which of these is not a function of Golgi apparatus?
a) Site of synthesis of glycoproteins and glycolipids b) Secretion
c) Membrane transformation d) Site of protein synthesis
19. Which of the following statement regarding mitochondrial membrane is not correct?
a)
The enzymes of the electron transfer chain are embedded in the outer membrane
b)
The inner membrane is highly convoluted forming a series of infoldings.
c) The outer membrane resembles a sieve.
d) The outer membrane is permeable to all kinds of molecules.
20. In plant cells, peroxisomes are associated with _____.
a) Photorespiration b) Phototropism c) Photoperiodism
d) Photosynthesis
21. Water soluble pigments found in plant cell :

- a) Anthocyanins b) Xanthophylls c) Chlorophylls d) Carotenoids
22. The type of ribosomes found in prokaryotes is:
a) 80S type b) 70S type c) 30S type d) 50S type.
23. Ribosomes were discovered by _____.
a) Golgi b) Porter c) De Robertis d) Palade
24. The desmosomes are concerned with _____.
a) Cytolysis b) Cell division c) Cell adherence d) Cellular excretion
25. Flagella of prokaryotic and eukaryotic cells differ in _____.
a) Type of movement and placement in cell
b) Location in cell and mode of functioning
c) Microtubular organisation and type of movement.
d) Microtubular organisation and function.
26. In chloroplast, chlorophyll is present in:
a) Inner membrane b) Thylakoid membrane c) Outer membrane
d) Stroma
27. Polysome is formed by:
a) Ribosomes attached to each other in a linear arrangement
b) Several ribosomes attached to a single mRNA
c) Many ribosomes attached to a strand of endoplasmic reticulum
d) A ribosome with several subunits.
28. The best material for the study of structure of cell membrane is
a) RBC of human b) liver cell c) kidney cell d) muscle cell.
29. Assertion : Leucoplasts perform photosynthesis.
Reason: Chloroplasts store fats, starch and proteins
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
30. Cell wall shows _____.

- a) Complete permeability b) Semi-permeability
c) Differential permeability d) Impermeability
31. Which of these is not correct regarding ribosomes?
a) Non-membrane bound b) Present in the cytoplasm and on RER
c) Absent in chloroplast and mitochondria
d) Take part in protein synthesis
32. In which of the following parts of mitochondria succinic dehydrogenase enzyme is located?
a) Perimitochondrial space b) Outer membrane c) Matrix
d) Inner membrane
33. Peptide synthesis inside a cell takes place in :
a) Mitochondria b) Chromoplast c) Ribosomes d) Chloroplast
34. The proteins are synthesised at _____.
a) Ribosomes b) Mitochondria c) Centrosomes d) Golgi bodies
35. Which one of these is not a eukaryote?
a) Euglena b) Anabaena c) Spirogyra d) Agaricus
36. The eukaryotic genome differs from the prokaryotic genome because _____.
a) DNA is complexed with histones in prokaryotes
b) Repetitive sequences are present in eukaryotes
c) Genes in the former cases are organised into operons
d) DNA is circular and single stranded in prokaryotes
37. Name of Schleiden and Schwann are associated with _____.
a) Protoplasm as the physical basis of life b) Cell theory
c) Theory of cell lineage d) Nucleus functions as control center of cell
38. Angstrom (\AA) is equal to _____.
a) 0.01 mm b) 0.001 mm c) 0.0001 mm d) 0.00001 mm
39. Which one is an organelle within an organelle?
a) ER b) Mesosome c) Peroxisome d) Ribosome
40. Which organelle is not a part of the endomembrane system?
a) ER b) Golgi complex c) Lysosomes d) Mitochondria
41. Which chemical property is shared by all types of lipids forming the plasma membrane?

- a) Sugar component b) Glycerol backbone c) Phosphate group
d) Hydrophobic region
42. Assertion: Lysosomes are capable of digesting carbohydrates, proteins, lipids and nucleic acids
Reason: Lysosomes are rich in hydrolytic enzymes like lipases, proteases and carbohydrases
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false
- d) If both assertion and reason are false
43. Assertion: The acrocentric chromosome has centromere at the terminal position.
Reason: The metacentric chromosome has centromere slightly away from the middle of the chromosome
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false
44. Which one is apparato reticolare interno?
a) Golgi apparatus b) Endoplasmic reticulum c) Microfilaments
d) Microtubules
45. According to most recent studies, each chromosome consists of
a) single double helical DNA which is highly coiled and folded
b)
variable number of DNA helices, depending upon the length of chromosome

- c) many small DNA helices, which are joined by peptide linkages
d) small DNA helices, wrapped around each other like a rope.
46. Prokaryotic cells are generally ___ and multiply ___ than the eukaryotic cells.
a) smaller, slower b) larger, slower c) smaller, faster d) larger, faster
47. Which of the following is not true for a eukaryotic cell?
a) Cell wall is made up of peptidoglycans.
b) It has 80S type of ribosome present in the cytoplasm
c) Mitochondria contain circular DNA
d) Membrane bound organelles are present
48. Which of the following statements is not true for the cell membrane?
a) It is present in both plant and animal cells.
b) Lipids are present in it as bilayer
c) Proteins may be peripheral or integral in it.
d) Carbohydrates are never found in it.
49. Inner membrane convolutions of a mitochondrion are known as _____ .
a) Lamellae b) Thylakoids c) Grana d) Cristae
50. Which one of these is not correct regarding peroxisomes?
a) Single membrane bound organelles
b) Perform photorespiration in C3 plants
c) Take part in synthesis and storage of lipids
d) Protect a cell from the toxic effects of H_2O_2
51. Who gave the lamellar or sandwich model of cell membrane?
a) Singer and Nicolson b) Danielli and Davson c) J. Robertson
d) None of these
52. Which one of the following is not a constituent of cell membrane?
a) Glycolipids b) Proline c) Phospholipids d) Cholesterol
53. Different cells have different sizes. Arrange the following cells in an ascending order of their size and select the correct option.
(i) Mycoplasma
(ii) Ostrich egg
(iii) Human RBCs
(iv) Bacteria

- a) $(i) \rightarrow (iv) \rightarrow (iii) \rightarrow (ii)$ b) $(i) \rightarrow (iii) \rightarrow (iv) \rightarrow (ii)$ c) $(ii) \rightarrow (i) \rightarrow (iii) \rightarrow (iv)$
 d) $(iii) \rightarrow (ii) \rightarrow (i) \rightarrow (iv)$

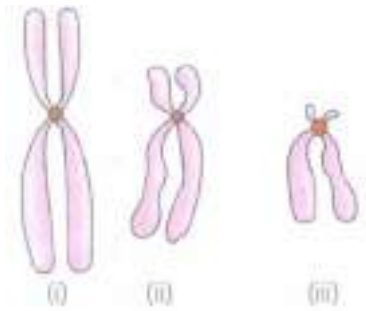
54. Ribosomes are produced in _____ .

- a) Nucleolus b) Cytoplasm c) Mitochondria d) Golgibody

55. Smooth endoplasmic reticulum is well developed in the cells which synthesise:

- a) steroids b) proteins c) carbohydrates d) all of these.

56. Refer to the given figure.



a)

Metacentric	Submetacentric	Acrocentric
(i)	(ii)	(iii)

b)

Metacentric	Submetacentric	Acrocentric
(ii)	(i)	(iii)

c)

Metacentric	Submetacentric	Acrocentric
(ii)	(i)	(iii)

d)

Metacentric	Submetacentric	Acrocentric
(ii)	(iii)	(i)

57. The cell organelle involved in the glycosylation of proteins is

- a) ribosome b) peroxisome c) mitochondrion
 d) endoplasmic reticulum.

58. Assertion: The fimbriae are elongated tubular structures made of a special protein.

Reason: The pili are small bristle like fibres sprouting out of the cell.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

59. Genophore/bacterial genome or nucleoid is made of _____

- a) Histones and non-histones b) RNA and histones
c) A single double stranded DNA d) A single stranded DNA

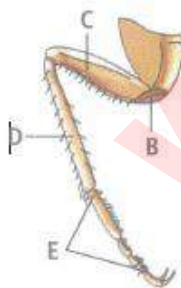
60. The stain used to visualise mitochondria is

- a) fast green b) safranin c) acetocarmine d) janus green

61. Organelle/organoid involved in genetic engineering is _____ .

- a) Plasmid b) Mitochondrion c) Golgi apparatus d) Lomasome

62. In the given diagram of a leg of cockroach, parts have been indicated by alphabets. Select the answer in which these alphabets have been correctly matched with the parts which they indicate.



a)

A	B	C	D	E
Coxa	Tibia	Tarsus	Femur	Trochanter

b)

A	B	C	D	E
Coxa	Femur	Trochanter	Tarsus	Tibia

c)

A	B	C	D	E
Coxa	Tarsus	Femur	Tibia	Trochanter

d)

A	B	C	D	E
Coxa	Trochanter	Femur	Tibia	Tarsus

63. Offsets are produced by _____ .

- a) Parthenocarpy b) Mitotic divisions c) Meiotic divisions
d) Parthenogenesis

64. Element necessary for middle lamella is _____ .

- a) Ca b) Zn c) K d) Cu

65. Assertion : The cells that have membrane bound organelles are called eukaryotic
Reason: The cells that lack membrane bound organelles are called prokaryotic.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false.
66. Lipids are arranged within the membrane with
- a)
polar heads toward inner side and the hydrophobic tails toward outside
- b) both heads and tails toward outside
- c) heads toward outside and tail towards inside
- d) both heads and tails toward inside
67. _____ are the microbodies, which take part in glyoxylate pathway, bounded by a single membrane and are usually present in germinating fatty seeds
- a) Glyoxysomes b) Peroxisomes c) Sphaerosomes d) Lysosomes
68. The latest model of cell membrane is the
- a) Unit membrane model b) Fluid mosaic model
c) Danielli and Davson's model d) Robertson's model.
69. Resolution power is the ability to _____ .
- a) Distinguish two trees b) Distinguish two close objects
c) Distinguish amongst organelles d) Magnify image
70. Which of these statements is/are true?
- (i) The surface area available for cellular functions in a prokaryotic cell is less than that in a eukaryotic cell.
- (ii) The total genome size of a prokaryotic cell is always less than that of a eukaryotic cell.

(iii) Unlike eukaryotes, no special respiratory organelles are found in prokaryotes. Hence they respire at a much lesser rate than eukaryotes.

(iv) Eukaryotic cells show various membrane bound organelles such as chloroplasts and nucleus while ribosomes are the only membrane bound organelles found in prokaryotes.

a) (i) and (ii) b) (iv) only c) (iii) only d) (i), (ii) and (iv)

71. Dye injected into a plant cell might be able to enter an adjacent cell through

a) microtubule b) microfilament c) plasmodesmata d) tight junction.

72. Lysosomes have a high content of _____ .

a) Hydrolytic enzymes b) Lipoproteins c) Polyribosomes
d) DNA ligases

73. Assertion : The chromoplasts contain fat soluble carotenoid pigments like carotene and xanthophylls etc.

Reason : These pigments give yellow, orange or red colour to some parts of the plant.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

74. A phospholipid molecule is amphipathic and produces two layers coming in contact with H₂O. The head of phospholipid molecule is

a) at an angle of 40° b) at the outer surface c) on the inner side
d) embedded in protein molecules

75. Assertion: Pili are nonmotile appendages of bacteria

Reason: Pili take part in conjugation.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

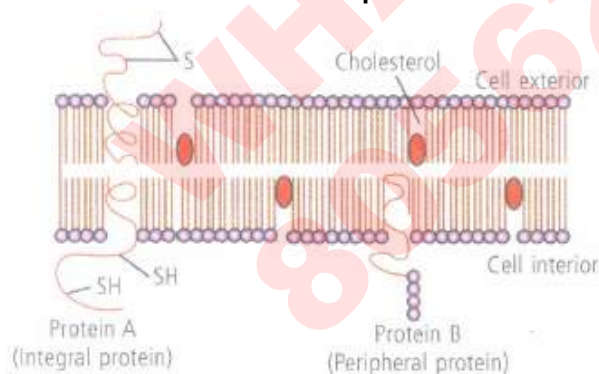
76. Match the following and select the correct answer:

Column I	Column II
(A) Centriole	(i) Infoldings in mitochondria
(B) Chlorophyll	(ii) Thylakoids
(C) Cristae	(iii) Nucleic acids
(D) Ribozymes	(iv) Basal body, cilia or flagella

a) A (iv), B (ii), C (i), D (iii) b) A (i), B (ii), C (iv), D (iii)

c) A (i), B (iii), C (ii), D (iv) d) A (i), B (iii), C (ii), D (iv)

77. A student made a pictorial representation of a eukaryotic cell membrane and labelled the components as follows.



The student has made errors while labelling the components of membrane. Which of the following hold true regarding the error?

(i) Protein A should be labelled as trans-membrane protein only and not as integral protein.

(ii) The polarity of the protein A should be reversed because the cytosolic phase always shows reducing environment.

(iii) Position of cholesterol molecule should be close to polar region as it contains a polar group.

(iv) Protein B should be labelled as integral membrane protein and not as peripheral glycoprotein.

- a) (i) and (ii) b) (iii) and (iv) c) (ii) and (iii) d) (i) and (iv)
78. Are self replicating, extra chromosomal segments of double stranded circular and naked DNA, present in a bacterial cell:
a) Plasmids b) Nucleoid c) Mesosomes d) Bacteriophages
79. If you remove the cell wall from a plant cell and place it into a drop of water
a) the cell would begin to grow b) the cell would shrink
c) the cell would burst d) nothing would happen
80. Correct sequence of layers of bacterial cell envelope from outward to inward is
a) Cell wall → Glycocalyx → Cell membrane
b) Cell membrane → Glycocalyx → Cell wall
c) Glycocalyx → Cell wall → Cell membrane
d) Glycocalyx → Cell membrane → Cell wall
81. Protein synthesis in an animal cell occurs _____ .
a) Only on the ribosomes present in cytosol.
b)
Only on ribosomes attached to the nuclear envelope and endoplasmic reticulum.
c) On-ribosomes present in the nucleolus as well as in cytoplasm.
d) On ribosomes present in cytoplasm as well as in mitochondria.
82. Which one of the following is not an inclusion body found in prokaryotes?
a) Polysome b) Phosphate granule c) Cyanophycean granule
d) Glycogen granule
83. The molecules in the membrane that limit its permeability are the
a) carbohydrates b) phospholipids c) proteins d) water.
84. Which of the following structures is not found in a prokaryotic cells?
a) Plasma membrane b) Nuclear envelope c) Ribosome
d) Mesosome
85. Which one of the following events does not occur in rough endoplasmic reticulum?
a) Cleavage of signal peptide b) Protein glycosylation
c) Protein folding d) Phospholipid synthesis

86. Match column I with column II and select the correct option from the codes given below

	column I		column II
A	Leeuwenhoek	(i)	First saw and described a living cell
B	Robert Brown	(ii)	Presence of cell wall is unique to plant cells
C	Schleiden	(iii)	Discovered the nucleus
D	Schwann	(iv)	All plants are composed of different kinds of cell

- a) A-(i), B-(iii), C-(iv), D-(ii) b) A-(i), B-(iii), C-(ii), D-(iv)
c) A-(iii), B-(i), C-(iv), D-(ii) d) A-(i), B-(iv), C-(ii), D-(iii)

87. Select the wrong statement from the following:

a)

Both chloroplasts and mitochondria have an internal compartment the thylakoid space bounded by the thylakoid membrane

b) Both chloroplasts and mitochondria contains DNA

c) The chloroplasts are generally much larger than mitochondria

d)

Both chloroplasts and mitochondria contain an inner and an outer membrane

88. Polyribosomes are aggregation of:

a) ribosomes and rRNA b) peroxisomes

c) several ribosomes held together by a string of mRNA d) rRNA

89. How does a cell rid itself of defective or malfunctioning organelles?

a)

They are engulfed by plastids and stored until export from cell is possible.

b) Defective parts accumulate until the cell itself dies

c) They are exported by exocytosis.

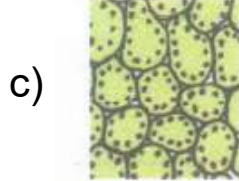
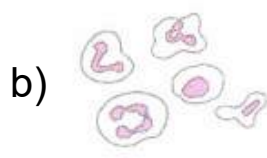
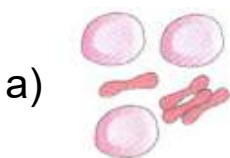
d)

Lysosomes assist in the removal of defective organelles by digesting them.

90. DNA is mainly found in _____ .

a) Nucleus b) Cytoplasm c) Both (a) and (b) d) Nucleolus

91. Assertion: Mitochondria are called 'power houses' of the cell.
Reason: Mitochondria produce cellular energy in the form of ATP.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false
92. Which one of the following has its own DNA?
a) Mitochondria b) Dictyosome c) Lysosome d) Peroxisome
93. Middle lamella is composed of :
a) Calcium pectate b) Calcium pectates c) Muramic acid
d) Hemicellulose
94. Ribosomes of the cytoplasm, chloroplast and mitochondrion are respectively
a) 80S, 80S and 70S b) 80S, 70S and 70S c) 70S in all d) 80S in all
95. Plastids differ from mitochondria on the basis of which of the following features?
a) Presence of two layers of membrane b) Presence of ribosome
c) Presence of thylakoids d) Presence of DNA
96. Microtubules absent in _____.
a) Mitochondria b) Centriole c) Flagella d) Spindle fibres
97. Mechanical support, enzyme circulation, protein synthesis and detoxification of drugs are the functions of
a) dictyosomes b) chloroplast c) ribosomes d) ER.
98. Tarun observed a slide of white blood cells under microscope. His teacher asked him to draw the diagram. Select the diagram which should be drawn by Tarun.



99. Which of the following stains is not used for staining chromosomes?

- a) Basic Fuchsin b) Safranin c) Methylene green d) Carmine

00. What is true about ribosomes?

a)

The prokaryotic ribosomes are 80S, where "S" stands for sedimentation coefficient.

b) These are composed of ribonucleic acid and proteins.

c) These are found only in eukaryotic cells.

d) These are self-splicing introns of some RNAs.

01. Microtubules are constituents of:

a) Centrosome, nucleosome and centrioles

b) Cilia, flagella and peroxisomes c) Spindle fibres, centrioles and cilia

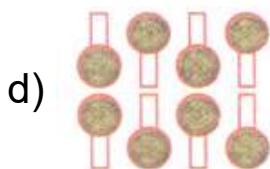
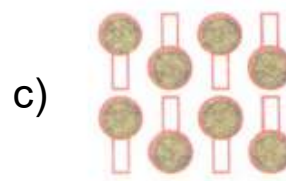
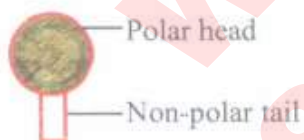
d) Centrioles, spindle fibres and chromatin

02. Which group of organelles is involved in synthesis of substances needed by cell?

a) Lysosome, vacuole, ribosome b) Vacuole, RER, SER

c) Ribosome, RER, SER d) RER, lysosome, vacuole

03. The lipid molecules present in plasma membrane have polar heads and non-polar tails (as shown in figure). Which option represents the correct arrangement of lipids in lipid bilayer?



04. The most abundant lipid in the cell membrane is

- a) cutin b) glycolipid c) steroid d) phosphoglycerides

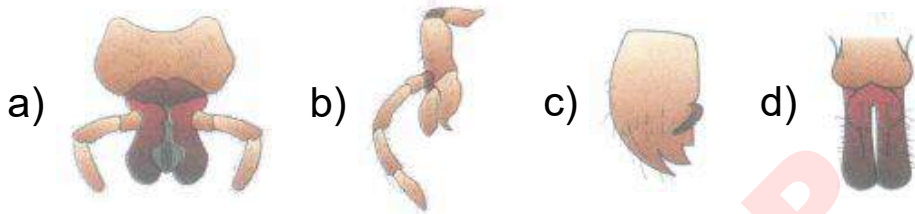
05. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells?

- a) Golgi bodies b) Polysomes c) Endoplasmic reticulum
d) Peroxisomes

06. Select the mismatch:

- a) Gas vacuoles - Green bacteria
b) Large central vacuoles - Animal cells c) Protists - Eukaryotes
d) Methanogens - Prokaryotes

07. Which of the following figures shows the mandibles of cockroach?



08. Which of the following is correct regarding the structure of a section of cilia / flagella?

a)

Peripheral microtubules (doublets)	Central microtubules (singlets)	Radial spokes	Central sheath
9+0	2	8	1

b)

Peripheral microtubules (doublets)	Central microtubules (singlets)	Radial spokes	Central sheath
9+2	9+0	9	1

c)

Peripheral microtubules (doublets)	Central microtubules (singlets)	Radial spokes	Central sheath
9	2	9	1

d)

Peripheral microtubules (doublets)	Central microtubules (singlets)	Radial spokes	Central sheath
3	6	9	1

09. Nuclear envelope is a derivative of:

- a) Membrane of Golgi complex b) Microtubules
c) Rough endoplasmic reticulum d) Smooth endoplasmic reticulum
10. Which of the given statements are correct?
(i) *Bacillus subtilis* is a Gram (+Ve) bacteria
(ii) *Escherichia coli* is a Gram (-ve) bacteria.
(iii) Washing of the Gram's stain in Gram (-ve) bacteria is due to high lipid content of the cell wall, which gets dissolved in organic solvents like acetone.
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)
11. Extranuclear inheritance is due to the presence of genes In
a) mitochondria and chloroplasts b) nucleus and mitochondria
c) nucleus and chloroplasts d) endoplasmic reticulum and mitochondria
12. Read the given statements.
(i) Flat membranous sacs in stroma of chloroplasts
(ii) Infoldings in mitochondria
(iii) Disc shaped sacs in Golgi apparatus
Select the correct option as per the codes given above.
Cristae Cisternae Thylakoids
a) (iii) (i) (ii) b) (i) (ii) (iii) c) (ii) (iii) (i) d) (iii) (ii) (i)
13. The function of glyoxysome is
a) protein metabolism b) carbohydrate metabolism c) fat metabolism
d) protein synthesis
14. Select the incorrect pair.
a) Cell wall - Structural support b) Central vacuole - Storage
c) Amyloplast Starch - storage d) Plasmodesmata - Protection
15. Centromere is a part of _____.
a) Ribosomes b) Chromosome c) Mitochondria
d) Endoplasmic reticulum
16. Assertion : The endomembrane system includes endoplasmic reticulum (ER), Golgi complex, lysosomes and vacuoles
Reason : Mitochondria, chloroplast and peroxisomes are not the part of endomembrane system because their functions are not coordinated with the same

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

17. The Golgi complex plays a major role _____ .

a) In digesting proteins and carbohydrates.

b) As energy transferring organelles.

c)

In post translational modification of proteins and glycosylation of lipids.

d) In trapping the light and transforming it into chemical energy.

18. According to the modern concept, cell membrane is

a) solid b) quasifluid c) fluid d) solidified sheath

19. Which of the following options is true for a secretory cell?

a) Golgi apparatus is absent. b) RER is easily observed in the cell.

c) Only SER is present d) Secretory granules are formed in nucleus

20. The osmotic expansion of a cell kept in water is chiefly regulated by:

a) Mitochondria b) Vacuoles c) Plastids d) Ribosomes

21. _____ are granular structures first observed under electron microscope as dense particles by _____ (1955).

a) Ribosomes, George Palade b) Ribosomes, Perner

c) Lysosomes, de Duve d) Peroxisomes, de Duve

22. All plastids have similar structure because they can _____ .

a) Store starch, lipids and proteins

b) Get transformed from one type to another c) Perform same function

d) Be present together

23. Match the cell organelles given in column I with cellular processes in column II and select the correct option from the codes given below

Column I		Column II
A Lysosomes	(i)	Protein synthesis
B Ribosomes	(ii)	Hydrolytic activity

C	Smooth endoplasmic	(iii)	Steroid synthesis
D	Centriole	(iv)	Formation of spindle

a)

A	B	C	D
(ii)	(i)	(iii)	(iv)

b)

A	B	C	D
(i)	(iii)	(iv)	(ii)

c)

A	B	C	D
(i)	(iv)	(iii)	(ii)

d)

A	B	C	D
(iv)	(iii)	(i)	(ii)

24. The movement of cilia and flagella is due to the presence of
 a) radial spokes b) central sheath c) singlet microtubules
 d) dyneins.
25. Assertion: The middle lamella is a layer made up of calcium pectate.
 Reason : It holds the different neighbouring cells together.
 a)
 If both assertion and reason are true and reason is the correct explanation of assertion
 b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false
 d) If both assertion and reason are false.
26. A student wishes to study the cell structure under a light microscope having 10X eyepiece and 45X objective. He should illuminate the object by which one of the following colours of light so as to get the best possible resolution?
 a) Blue b) Green c) Yellow d) Red
27. The chromosome in which centromere lies slightly away from the middle of the chromosome resulting into one shorter arm and one longer arm, is called as
 a) metacentric b) submetacentric c) acrocentric d) telocentric.
28. The function of intracellular membrane is not to
 a) establish a number of compartments within the cell
 b) provide for the neat spatial organisation of enzymes and pigments
 c) keep the cell rigidity so that it does not collapse
 d)
 provide a system of channel for the distribution of nutrients within the cell

29. Identify the cells whose secretion protects the lining of gastro-intestinal tract from various enzymes.
a) Goblet Cells b) Oxyntic Cells c) Duodenal Cells d) Chief Cells
30. Which one of the following does not differ in E.coli and Chlatnydomonasl.
a) Ribosomes b) Chromosomal organization c) Cell wall
d) Cell membrane
31. Some of the enzymes which are associated in converting fats into carbohydrates, are present in _____.
a) Liposomes b) Golgi bodies c) Microsomes d) Glyoxysomes
32. The prokaryotic flagella possess _____.
a) Unit membrane enclosed fibre b) Protein membrane enclosed fibre
c) '9+2' membrane enclosed structure
d) Helically arranged protein molecule
33. Centrioles arise from
a) pre-existing centrioles' b) de novo c) nuclear envelope
d) sphaerosome.
34. Mitochondria and chloroplast are:
(a) Semi-autonomous organelles
(b) Formed by division of pre-existing organelles and they contain DNA but lack protein synthesizing machinery
Which one of the following options is correct?
a) Both (a) and (b) are false b) Both (a) and (b) are correct
c) (b) is true but (a) is false d) (a) is true but (b) is false
35. An organelle with an internal cross-section showing characteristic "9 + 2" array is the:
a) microtubule b) microfilament c) cilium or flagellum
d) cytoskeleton.
36. If you remove the fimbriae from the bacterial cell, which of the following would you expect to happen?
a) The bacteria could no longer swim.
b) The bacteria would not adhere to the host tissue.
c) Transportation of molecules across the membrane would stop.
d) The shape of bacteria would change
37. Bright colour of petals is due to the presence of

a) chloroplast b) anthocyanin c) elaioplast d) amyloplast.

38. The figures of cork cells as seen by Robert Hooke were published in the book

a) Origin of species b) Species plantarum c) Genera plantarum
d) Micrographia.

39. Select the correct statement from the following regarding cell membrane
a)

Lipids are arranged in a bilayer with polar heads towards the inner part

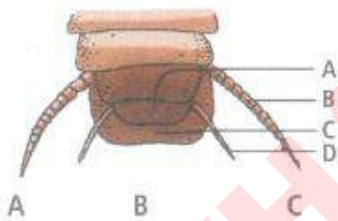
b)

Fluid mosaic model of cell membrane was proposed by Singer and Nicolson

c) Na^+ And K^+ Ions move across cell membrane by passive transport

d) Proteins make up 60 to 70% of the cell membrane

40. The given figure represents posterior region of male cockroach. Identify the parts labelled as A, B, C and D.



a)

A	B	C	D
9 th sternum	Anal style	10 th tergum	Anal cercus

b)

A	B	C	D
Anal style	Anal cercus	10 th tergum	9 th sternum

c)

A	B	C	D
9 th sternum	Anal cercus	10 th tergum	Anal style

d)

A	B	C	D
9 th tergum	Anal cercus	10 th sternum	Anal style

41. According to unit membrane structure, the thickness of plasma membrane is about

a) 35A b) 20A c) 75A d) 100A

42. Assertion : The Golgi apparatus mainly performs the function of packaging materials

Reason : Materials to be packed in the form of vesicles from the ER fuse with trans face of the Golgi apparatus

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false

d) If both assertion and reason are false.

43. Mitochondrial cristae are sites of _____ .

a) Breakdown of macromolecules b) Protein synthesis

c) Phosphorylation of flavoproteins d) Oxidation-reduction reactions

44. The structure that help some bacteria to attach to rocks and for host tissues are :

a) Holdfast b) Rhizoids c) Fimbriae d) Mesosomes

45. Assertion: Peripheral proteins are partially or totally buried in the membrane.

Reason: Integral proteins lie on the surface of membrane

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false

d) If both assertion and reason are false.

46. Which one of the following is not considered as a part of the endomembrane system?

a) Golgi complex b) Peroxisome c) Vacuole d) Lysosome

47. Major site for synthesis of lipids is:

a) Symplast b) SER c) RER d) Nucleoplasm

48. As they release hydrolase that digest old and damaged cells, the term suicide bags is aptly used by cell biologists for

a) Golgi bodies b) lysosomes c) glyoxysomes d) peroxisomes.

49. Which of the following options is correct about structures visible in the cross-section of a centriole?

a)

Peripheral Central microtubules (triplets)	Central microtubules (singlets)	Hub	Spoke	triplet bridge
9	2	1	9	9

b)

Peripheral Central microtubules (triplets)	Central microtubules (singlets)	Hub	Spoke	triplet bridge
9	2	9	9	9

c)

Peripheral Central microtubules (triplets)	Central microtubules (singlets)	Hub	Spoke	triplet bridge
9	2	1	2	2

d)

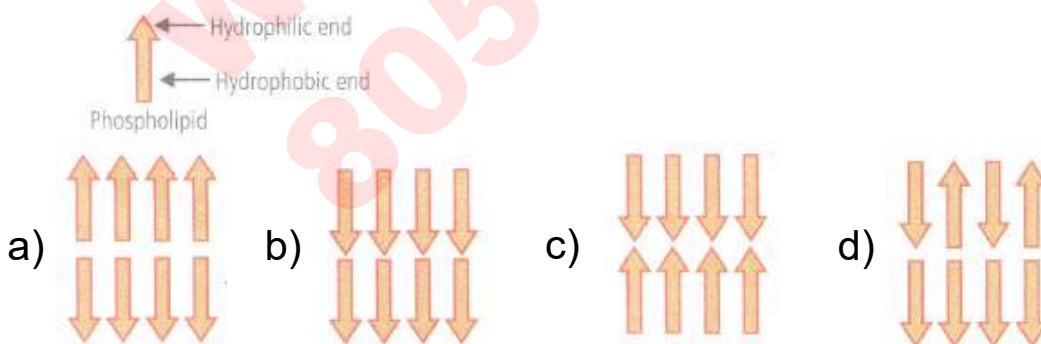
Peripheral Central microtubules (triplets)	Central microtubules (singlets)	Hub	Spoke	triplet bridge
9	0	1	9	9

50. A scientist isolated the plasma membranes from some animal cells and put them in a solution of chemicals that stabilised the membranes. When she added a small amount of a salt solution, she discovered that although the membranes seemed intact, the amount of protein in the stabilising solution had increased. These new proteins in the stabilising solution were probably

- a) peripheral proteins b) integral proteins c) lipid-anchored proteins
d) trimeric G proteins

51. Amyloplasts, elaioplasts and aleuroplasts belong to ____ category of plastids.
a) chloroplasts b) chromoplasts c) leucoplasts d) all of these
52. Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are termed as _____.
a) Plastidome b) Polyhedral bodies c) Polysome d) Nucleosome
53. What is true of membrane lipids and proteins?
a) None can flip-flop b) Both can flip-flop
c) Proteins can flip-flop but lipids cannot
d) Lipids can flip-flop but proteins cannot
54. These are the densely stained reticular structures present near the nucleus, consisting of many flat, disc shaped cisternae of 0.5 - 1.0 μ m diameter. These are
a) chloroplasts b) endoplasmic reticulum c) mitochondria
d) Golgi apparatus.
55. Select the wrong statement with respect to the structure of a plant cell:
a) Cellulosic cell wall is present inside the cell membrane.
b) Centrioles are usually absent c) A large central vacuole is present
d) Golgi apparatus is formed of a number of unconnected units called dictyosomes
56. Read the given statements and select the correct option.
Statement 1 : The cisternae in Golgi complex have cis face and trans face.
Statement 2: The cis face is also called forming face and trans face is also called maturing face.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
57. Important site for formation of glycoproteins and glycolipids is _____.
a) Vacuole b) Golgi apparatus c) Plastid d) Lysosome

58. Which of the following statements about inclusion bodies is incorrect?
- They lie free in the cytoplasm
 - These represent reserve material in cytoplasm.
 - They are not bound by any membrane
 - These are involved in ingestion of food particles.
59. Ribosomes are the centre for _____ .
- Respiration
 - Photosynthesis
 - Protein synthesis
 - Fat synthesis
60. Cellular organelles with membranes are:
- Lysosomes, Golgi apparatus and mitochondria
 - Nuclei, ribosomes and mitochondria
 - Chromosomes, ribosomes and endoplasmic reticulum
 - Endoplasmic reticulum, ribosomes and nuclei
61. The solid linear cytoskeletal elements having a diameter of 6nm and made up of a single type of monomer are known as:
- Microfilaments
 - Intermediate filaments
 - Lamins
 - Microtubules
62. A red blood corpuscle (RBC) was kept in a solution and treated so that it became inside-out. What will be the polarity of the phospholipid bilayer in this cell?



63. Match column I with column II and select the correct option from the codes given below.

Column I		Column II
A Nucleolus	(i)	Lipid storage
B Sphaerosomes	(ii)	Glycolate metabolism
C Peroxisomes	(iii)	Transport of macromolecules
D Plasmodesmata	(iv)	RNA synthesis

a)

A	B	C	D
(iv)	(i)	(iii)	(ii)

b)

A	B	C	D
(i)	(ii)	(iv)	(iii)

c)

A	B	C	D
(iv)	(i)	(ii)	(iii)

d)

A	B	C	D
(i)	(ii)	(iii)	(iv)

64. Match column I with column II and select the correct option from the codes given below.

Column I		Column II
A Mitochondria	(i)	Without membrane
B Lysosomes	(ii)	Single membrane
C Ribosomes	(iii)	Double membrane
D Nucleus		

a)

A	B	C	D
(i)	(ii)	(iii)	(iii)

b)

A	B	C	D
(ii)	(i)	(i)	(ii)

c)

A	B	C	D
(iii)	(ii)	(i)	(ii)

d)

A	B	C	D
(ii)	(iii)	(i)	(iii)

65. Cytoskeleton is made up of:

- a) Callose deposits b) Cellulosic microfibrils
c) Proteinaceous filaments d) Calcium carbonate granules

66. Study the following statements regarding mitochondria and select the correct ones.

- (i) These are the sites of aerobic respiration.
(ii) Matrix contains single, circular dsDNA molecule, a few RNA molecules, 70S ribosomes.
(iii) Mitochondria divide by fission.

(iv) Mitochondria are fully-autonomous.

- a) (i) and (ii) b) (iii) and (iv) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)

67. The main arena of various types of activities of a cell is:

- a) Plasma membrane b) Mitochondrion c) Cytoplasm d) Nucleus

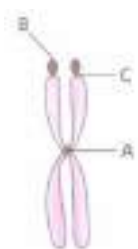
68. Which one of the following elements is responsible for maintaining turgor in cells?

- a) Potassium b) Sodium c) Magnesium d) Calcium

69. Cell membrane is selective permeable. This means that it:

- a) allows all materials to pass through
b) allows only water to pass through

- c) allows only certain materials to pass through
d) allows only ions to pass through.
70. Which of the following represents the features of lysosomes
a) A lower pH than the cytoplasm b) Reduced hydrolase activity
c) Double membrane envelope d) All of these
71. Oxysomes or F_0-F_1 particles occur on _____.
a) Thylakoids b) Mitochondrial surface
c) Inner mitochondrial membrane d) Chloroplast
72. Which of the following is an energy dependent process?
a) Facilitated diffusion b) Active transport c) Endosmosis
d) Exosmosis
73. The mechanism of ATP formation both in chloroplast and mitochondria is explained by _____.
a) Relay Pump Theory of Godlewski b) Cholodny-Went's Model
c) Chemiosmotic Theory d) Munch's Mass Flow Hypothesis
74. Balbiani rings are sites of:
a) Nucleotide synthesis b) Polysaccharide synthesis
c) RNA and protein synthesis d) Lipid synthesis
75. Unicellular microscopic organisms were first studied by
a) Robert Hooke b) Priestley c) Pasteur d) Leeuwenhoek.
76. Cell theory was formulated by
a) Robert Hooke b) Leeuwenhoek c) Marcello Malpighi
d) Schleiden and Schwann
77. What does A, B and C represent in the given figure of a chromosome?



a)

A	B	C
Centriole	Satellite	Primary constriction

b)

A	B	C
Centriole	Satellite	Secondary constriction

c)

A	B	C
Centromere	Satellite	Secondary constriction

d)

A	B	C
Centromere	Satellite	Primary constriction

78. Addition of new cell wall particles amongst the existing ones is _____ .

- a) Deposition b) Apposition c) Intussusception d) Aggregation

79. Ribosomal RNA is actively synthesized in _____ .

- a) Lysosomes b) Nucleolus c) Nucleoplasm d) Ribosomes

80. Cells which are secretory in function have abundant:

- a) lysosomes b) endoplasmic reticulum c) dictyosomes
d) osteosomes.

81. Cell organelle extracted from endosperm of germinating castor beans are

- a) glyoxysomes b) vacuoles c) mitochondria d) none of these

82. Which of the following is true for nucleolus?

- a) It takes part in spindle formation
b) It is a membrane-bound structure
c) Larger nucleoli are present in dividing cells
d) It is a site for active ribosomal RNA synthesis

83. A major break through in the studies of cells came with the development of electron microscope. This is because _____ .

a)

The resolving power of the electron microscope is 200-350 nm as compared to 0.1-0.2 for the light microscope.

b)

Electron beam can pass through thick materials, whereas light microscopy requires thin sections.

c)

The electron microscope is more powerful than the light microscope as it uses a beam of electrons which has wavelength much longer than that of photons.

d)

The resolution power of the electron microscope is much higher than that of the light microscope.

84. According to widely accepted "fluid mosaic model" cell membranes are semi-fluid, where lipids and integral proteins can diffuse randomly. In recent years, this model has been modified in several respects. In this regard, which of the following statements is incorrect?

a) Proteins in cell membranes can travel within the lipid bilayer.

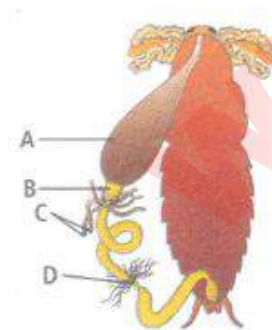
b) Proteins can also undergo flip-flop movements in the lipid bilayer.

c)

Proteins can remain confined within certain domains of the membrane.

d) Many proteins remain completely embedded within the lipid bilayer.

85. The given figure shows alimentary canal of cockroach. Identify the parts labelled as A to D and select the correct option.



a)

A	B	C	D
Gizzard	Crop	Hepatic caeca	Malpighian tubules

b)

A	B	C	D
Crop	Gizzard	Hepatic caecae	Malpighian tubules

c)

A	B	C	D
Crop	Gizzar	Malpighian tubules	Hepaticcaecae

d)

A	B	C	D
Gizzar	Crop	Malpighiantubule	Hepaticcaeca

86. Which of the following statements is incorrect for centrioles?

- a) Both the centrioles in a centrosome lie perpendicular to each other
- b) Central proteinaceous hub is missing in a centriole
- c) Each centriole has an organisation like that of a cartwheel
- d) Centrosome usually contains 2 cylindrical centrioles.

87. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
A	Dictysomes	(i)	Storage
B	Mitochondria	(ii)	Photosynthesis
C	Vacuoles	(iii)	Transparent
D	Grana	(iv)	Secretion
		(v)	Respiration

- a) (iv) (v) (i) (ii) b) (i) (ii) (iv) (iii) c) (iv) (i) (ii) (iii) d) (i) (ii) (iii) (iv)

88. In fluid mosaic model of plasma membrane _____ .

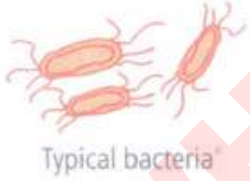


- a) Upper layer is non-polar and hydrophilic.
- b) Upper layer is polar and hydrophobic.
- c) Phospholipids form a bimolecular layer in middle part.
- d) Proteins form a middle layer.

89. Read the given statements and select the correct option.

Statement 1 : Chloroplast and mitochondria are semiautonomous bodies

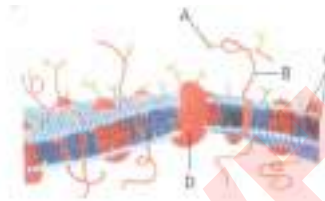
Statement 2: Chloroplast and mitochondria have their own DNA and protein synthesising machinery

- a) Both statements 1 and 2 are correct
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

90. Mesosomes are the infoldings of cell membrane, which
- (i) are present in both prokaryotic and eukaryotic cells.
 - (ii) help in cell wall formation, DNA replication and respiration.
 - (iii) increase the surface area of plasma membrane.
- a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii).
91. Which of the following cell organelles are named after the name of its discoverer?
- a) ER b) DNA c) Golgi bodies d) Mitochondria
92. Stroma in the chloroplasts of higher plant contains:
- a) Light-dependent reaction enzymes b) Ribosomes c) Chlorophyll
d) Light- independent reaction enzymes
93. Which of the following is the correct match?
- a) Amyloplasts - Store carbohydrates
b) Elaioplasts - Store fats and oils c) Aleuroplasts - Store proteins
d) All of these
94. Which of the following is enveloped by a nuclear membrane?
- a)  Typical bacteria b)  PPLO c)  Viruses d) None of these
95. Assertion: The arrangement of axonemal microtubules in cilia or flagella is called 9 + 2 array
Reason : The axoneme usually has nine pairs or doublets of radially arranged peripheral microtubules, and a pair of centrally located microtubules
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false.
96. A major site for synthesis of lipids is:
- a) SER b) Symplast c) Nucleoplasm d) RER

97. Assertion: The endoplasmic reticulum which lacks ribosomes is called smooth endoplasmic reticulum (SER).
Reason: SER is mainly involved in protein synthesis.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false
- d) If both assertion and reason are false.
98. Which of the following statements regarding sphaerosomes is not correct?
- a) Abundant in the endosperm cells of oil seeds
- b) Bounded by a single membrane
- c) Take part in synthesis and storage of lipids
- d) Take part in photorespiration
99. Golgi complex plays a major role in:
- a) Post translational modification of proteins and glycosylation of lipids
- b) Trapping light and transforming it into chemical energy
- c) Digesting proteins and carbohydrates
- d) An energy transforming organelle
100. Assertion: A plant cell bursts if placed in water
Reason: High turgor pressure causes bursting of plant cells
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false
- d) If both assertion and reason are false.
101. Which of the following are not membrane-bound?
- a) Ribosomes b) Lysosomes c) Mesosomes d) Vacuoles

02. Cell recognition and adhesion occur due to biochemicals of cell membranes named _____ .
a) Proteins b) Lipids c) Both (a) and (b)
d) Glycoproteins and glycolipids
03. Vacuole in a plant cell :
a) Lacks membrane, contains water and excretory substances
b) Is membrane bound, contains water and excretory substances
c) Is membrane bound, contains storage proteins and lipids
d) Lacks membrane and contains air
04. Binding of specific protein on regulatory DNA sequence can be studied by means of _____ .
a) Ultra centrifugation b) Electron microscope c) Light microscope
d) X-rays crystallography
05. Identify the components labelled as A, B, C and D in the given figure of cell membrane from the list (i) to (vii) given along with and select the correct option.



Components:

- (i) Sugar
- (ii) Protein
- (iii) Lipid bilayer
- (iv) Integral protein
- (v) Cytoplasm
- (vi) Cell wall
- (vii) External protein

The correct matching of components is

- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(ii), B-(i), C-(iii), D-(iv)
 - c) A-(i), B-(ii), C-(iii), D-(vi) d) A-(i), B-(ii), C-(iii), D-(vii)
06. A scientist wanted to genetically engineer a new type of corn plant that could withstand cold temperatures. He decided to try to change the composition of the plant's membrane to lower the temperature of phase

transition. Which of the following membrane changes might be expected to improve the cold tolerance of the plants?

- a) Increasing the length of the fatty acyl chains.
- b) Eliminating all steroids.
- c) Increasing the frequency of unsaturated fatty acyl chains.
- d) Decreasing the frequency of unsaturated fatty acyl chains.

107. Microtubule is involved in the _____ .

- a) Cell division b) Membrane architecture c) Muscle contraction
- d) DNA recognition

108. Select one which is not true for ribosomes.

- a) Made of two subunits b) Form polysome c) May attach to mRNA
- d) Have no role in protein synthesis

109. Middle lamella is composed mainly of:

- a) Muramic acid b) Calcium pectate c) Phosphoglycerides
- d) Hemicellulose

110. Mitotic spindle is mainly composed of which protein?

- a) Actin b) Myosin c) Tubulin d) Myoglobin

111. The function of the gap junction is to _____ .

a)

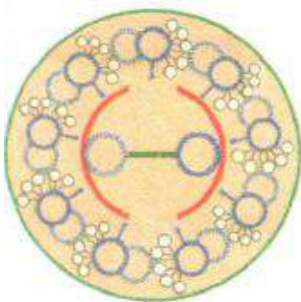
Facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules.

b) Separate two cells from each other.

c) Stop substance from leading across a tissue

d) Performing cementing to keep neighbour-ing cells together

112. Which of the following is correct for the given structure?



a) These are small structures which work like oars

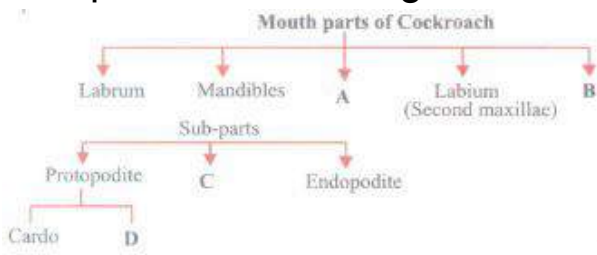
b) It is covered with plasma membrane. c) Its core is called axoneme

d) All of these

13. Lysosomes are _____ vesicular structures formed by the process of packaging in the _____ .
a) membrane bound, Golgi apparatus
b) non-membrane bound, Golgi apparatus c) membrane bound, ER
d) non-membrane bound, ER
14. Assertion: The quasifluid nature of lipid enables lateral movement of proteins within the overall bilayer.
Reason: This ability to move within the membrane is called fluidity and is important for cell growth.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.
d) If both assertion and reason are false.
15. _____ is directly connected to the outer nuclearis directly connected to the outer nuclear
a) Mitochondria b) Golgi body c) ER d) Chloroplast
16. Packing of substances for export from the cell occurs in the
a) SER b) Golgi bodies c) lysosome d) nucleolus.
17. The main organelle involved in modification and routing of newly synthesised proteins to their destinations is _____.
a) Chloroplast b) Mitochondria c) Lysosome
d) Endoplasmic reticulum
18. Magnification of compound microscope is not connected with _____.
a) Numerical aperture b) Focal length of objective
c) Focal length of eye piece d) Tube length
19. Which one of these statements is incorrect?

- a)
Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms.
- b) Glycolysis occurs in cytosol.
- c) Enzymes of TCA cycle are present in mitochondrial matrix.
- d)
Oxidative phosphorylation takes place in outer mitochondrial membrane.
20. Assertion : Ribosomes are non-membrane bound organelles found only in the procaryotic cells
Reason: Ribosomes are present only in the cytoplasm
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false
- d) If both assertion and reason are false
21. Select the incorrect match:
- a) Submetacentric Lshaped --Chromosomes chromosomes
- b) Allosomes-- Sex chromosomes c) Lampbrush --Diplotene bivalents
- d) Polytene-- Oocytes of amphibians Chromosomes
22. Golgi apparatus is absent in _____ .
- a) Higher plants b) Yeast c) Bacteria and blue-green algae
- d) None of the above
23. Who proposed a modification in the cell theory?
- a) Schleiden and Schwann b) Rudolf Virchow c) Robert Hooke
- d) Marcello Malpighi
24. What are those structures that appear as beads-on-string in the chromosomes when viewed under electron microscope?
- a) Genes b) Nucleotides c) Nucleosomes d) Base pairs
25. The Golgi complex participates in :
- a) Respiration in bacteria b) Formation of secretory vesicles
- c) Fatty acid breakdown d) Activation of amino acid

26. 'Omnis cellula-e cellula' i.e., new cells arise from preexisting cells; this statement was given by:
 a) Schleiden and Schwann b) Rudolf Virchow c) Robert Brown
 d) Robert Hooke
27. Membranous bag with hydrolytic enzymes which is used for controlling intracellular digestion of macromolecules is _____.
 a) Endoplasmic reticulum b) Nucleosome c) Lysosome
 d) Phagosome
28. Complete the following flowchart by selecting the correct option.



a)

A	B	C	D
Stipes	Hypopharynx	Exopodite	First maxillae

b)

A	B	C	D
Stipes	Exopodite	Hypopharynx	First maxillae

c)

A	B	C	D
First maxillae	Hypopharynx	Exopodite	Stipes

d)

A	B	C	D
First maxillae	Exopodite	Hypopharynx	Stipes

29. Read the given statements and select the correct option.

Statement 1 : Peroxisomes are involved in photorespiration of the plant cells and help in the lipid metabolism of animal cells.

Statement 2: They are the cells' garbage disposal system.

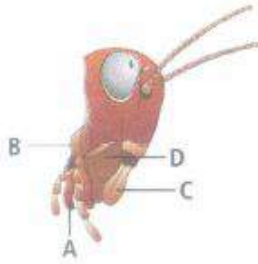
- a) Both statements 1 and 2 are correct
 - b) Statement 1 is correct but statement 2 is incorrect
 - c) Statement 1 is incorrect but statement 2 is correct
 - d) Both statements 1 and 2 are incorrect.
30. Read the given statements regarding a cell organelle.
- (i) It contains water, sap, excretory products and other unwanted materials.
 - (ii) It is bounded by a single membrane called tonoplast.
 - (iii) In plant cells, it can occupy upto 90% of cellular volume.
 - (iv) Its contents form cell sap.
 - (v) It maintains turgor pressure.
- The above features are attributed to
- a) lysosome b) vacuole c) peroxisome d) mitochondrion.
31. Which structures perform the function of mitochondria in bacteria?
- a) Mesosomes b) Nucleoid c) Ribosomes d) Cell wall
32. A cell organelle containing hydrolytic enzyme is :
- a) Mesosome b) Lysosome c) Microsome d) Ribosome
33. Glycocalyx (mucilage sheath) of a bacterial cell may occur in the form of a loose sheath called _____ or it may be thick and tough called _____
- a) capsule, slime layer b) slime layer, capsule c) mesosome, capsule
 - d) mesosome, slime layer
34. What is a tonoplast?
- a) Outer membrane of mitochondria b) Inner membrane of chloroplast
 - c) Membrane boundary of the vacuole of plant cells
 - d) Cell membrane of a plant cell
35. Plasma membrane consist mainly of :
- a) Protein embedded in a phospholipid bilayer
 - b) Protein embedded in a polymer of glucose molecules
 - c) Proteins embedded in a carbohydrate bilayer
 - d) Phospholipids embedded in protein bilayer
36. Which of the following statements is not correct?
- a) The hydrolytic enzymes of lysosomes are active under acidic pH.
 - b) Lysosomes are membrane bound structures.

- c)
Lysosomes are formed by the process of packaging in the endoplasmic reticulum.
- d) Lysosomes have numerous hydrolytic enzymes.
37. The most likely method, used to determine the structural details of a cell organelle is
a) autoradiography b) microdissection c) electron microscopy
d) phase contrast microscopy.
38. The chromosomes in which centromere is situated close to one end are:
a) Sub-metacentric b) Metacentric c) Acrocentric d) Telocentric
39. Organelle having flattened membrane bound cisternae and lying near the nucleus is _____.
a) Golgi apparatus b) Mitochondrion c) Centriole d) Nucleolus
40. Fluid mosaic model of cell membrane was put forward by _____.
a) Danielli and Davson b) Singer and Nicolson c) Gamet and Allard
d) Watson and Crick
41. An outer covering membrane is absent over _____.
a) Nucleolus b) Lysosome c) Mitochondrion d) Plastids
42. Choose the incorrect statement regarding cell membrane.
a)
Generally smaller molecules pass easily and readily than large molecules.
b)
Water soluble substances pass through it less readily than lipid soluble substances.
c) In addition to phospholipid membrane it also contains cholesterol.
d) None of these
43. A common characteristic feature of plant sieve tube cells and most of mammalian erythrocytes is
a) absence of mitochondria b) presence of cell wall
c) presence of haemoglobin d) absence of nucleus.
44. Integral cell membrane proteins

- a) are partially embedded in lipid layers
b) are completely embedded in lipid layers
c) show lateral but not vertical movements within bilayer of lipid
d) all of these.
45. The important site for the formation of glycoproteins and glycolipids is :
a) Vacuoles b) Plastids c) Lysosome d) Golgi apparatus
46. Ribosomes are composed of
a) RNA only b) Proteins only c) RNA and proteins
d) RNA, proteins and DNA
47. Which of the following features is common to prokaryotes and many eukaryotes?
a) Chromatin material present b) Cell wall present
c) Nuclear membrane present
d) Membrane-bound subcellular organelles present
48. Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP?
a) Lysosome b) Ribosome c) Chloroplast d) Mitochondrion
49. Match column I with column II and select the correct option from the codes given below.
- | | Column I | | Column II |
|----|-----------------|-------|---|
| A. | RER | (i) | Intracellular and extracellular digestion |
| B. | SER | (ii) | Lipid Synthesis |
| C. | Golgi complex | (iii) | Protein synthesis and secretion |
| D. | Lysosomes | (iv) | Moves materials out of the cell |
- a) A-(iii), B-(ii), C-(iv), D-(i) b) A-(ii), B-(iii), C-(iv), D-(i)
c) A-(i), B-(iii), C-(ii), D-(iv) d) A-(iv), B-(ii), C-(iii), D-(i)
50. Which one of the following cell organelles is enclosed by a single membrane?
a) Nucleus b) Mitochondria c) Chloroplasts d) Lysosomes
51. Assertion: Rudolf Virchow modified the hypothesis of cell theory given by Schleiden and Schwann.
Reason: Cell theory says that all cells arise from pre-existing cells.

- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false
- d) If both assertion and reason are false.
52. Which is correct about cell theory in view of current status of our knowledge about cell structure?
- a)
It needs modification due to discovery of subcellular structures like chloroplasts and mitochondria
- b)
Modified cell theory means that all living beings are composed of cells capable of reproducing
- c)
Cell theory does not hold good because all living beings do not have cellular organisation (e.g. viruses)
- d)
Cell theory means that all living objects consist of cells whether or not capable of reproducing
53. Many molecules can move briefly across the membrane without any requirement of energy and special membrane proteins. This is called _____
- a) active transport b) passive transport c) facilitated diffusion
- d) all of these
54. Select the incorrect statement regarding the plasma membrane.
- a) Ratio of proteins and lipids varies considerably in different cell types.
- b)
52% proteins and 40% lipids constitute the membrane of human RBC.
- c) Arrangement of proteins (P) and Lipids (L) is L-P-P-L.
- d) Head of lipid is hydrophilic.

55. The given figure represents head region of cockroach. In which one of the options all the four parts A, B, C, and D are labelled correctly?



a)

A	B	C	D
Labrum	Mandible	Maxilla	Labium

b)

A	B	C	D
Mandible	Maxilla	Labium	Labrum

c)

A	B	C	D
Maxilla	Labium	Mandible	Labrum

d)

A	B	C	D
Labium	Maxilla	Labrum	Mandible

56. The core of a cilium or flagellum composed of microtubules and their associated proteins is called
 a) blepharoplast b) axoneme c) microfilament d) tubulin
57. Which of the following is correct for the origin of lysosome (L)?
 a) ER --7 Golgi bodies --7 L b) Golgi bodies --7 ER --7 L
 c) Nucleus --7 Golgi bodies --7 L
 d) Mitochondria --7 ER --7 Goigi bodies --7 L
58. Which one of the following structures between two adjacent cells is an effective transport pathway?
 a) Plasmodesmata b) Plastoquinones c) Endoplasmic reticulum
 d) Plasmalemma
59. Select the correct matching in the following pairs:
 a) Smooth ER - Synthesis of lipids
 b) Rough ER - Synthesis of glycogen
 c) Rough ER - Oxidation of fatty acids
 d) Smooth ER-Oxidation of phospholipids
60. Select the option which arranges the following steps in a correct sequence as per Gram's staining technique: Treatment with 0.5% iodine solution (1), washing with water (2), treatment with absolute alcohol/acetone (3), staining with weak alkaline solution of crystal violet (4).

- a) $4 \rightarrow 1 \rightarrow 2 \rightarrow 3$ b) $3 \rightarrow 2 \rightarrow 1 \rightarrow 4$ c) $3 \rightarrow 1 \rightarrow 2 \rightarrow 4$
 d) $4 \rightarrow 2 \rightarrow 3 \rightarrow 1$

61. Which of the following organ has single membrane?

- a) Nucleus b) Cell wall c) Mitochondria d) Spherosomes

62. Cell organelles having hydrolases/digestive enzymes are _____

- a) Peroxisomes b) Lysosomes c) Ribosomes d) Mesosomes

63. Which of the following statements is incorrect?

a)

Mitochondria, unless specifically stained are not easily visible under the microscope.

b)

Physiological activity of cells determines the number of mitochondria per cell.

c)

Mitochondrion, a power house of cell has DNA, RNA, ribosomes and enzymes, so it can survive outside the cell.

d) Mitochondria divide by fission.

64. Which of the following is correct regarding the given figure



a)

No. of centromere	No. of kinetochore	No. of arms
1	2	2

b)

No. of centromere	No. of kinetochore	No. of arms
2	1	4

c)

No. of centromere	No. of kinetochore	No. of arms
1	2	4

d)

No. of centromere	No. of kinetochore	No. of arms
2	1	4

65. Which of the following statements regarding mitochondria is incorrect?

a) Enzymes of electron transport are embedded in outer membrane.

b) Inner membrane is convoluted with infoldings.

c)

Mitochondrial matrix contains single circular DNA molecule and ribosomes.

d)

Outer membrane is permeable to monomers of carbohydrates, fats and proteins.

66. Which organelle helps in the synthesis of lipids, cholesterol, steroids and visual pigments in epithelial cells of retina?

a) Golgi bodies b) RER c) SER d) Mitochondria

67. An elaborate network of filamentous proteinaceous structures present in the cytoplasm which helps in the maintenance of cells shape is called:

a) Thylakoid b) Endoplasmic reticulum c) Plasmalemma

d) Cytoskeleton

68. Protein synthesis in an animal cell takes place _____ .

a) Only in cytoplasm b) In the nucleolus as well as in the cytoplasm

c) In the cytoplasm as well as in mitochondria

d) Only on ribosomes attached to nucleus

69. Which one is the mis-matched pair?

a) Largest isolated - Egg of an ostrich single cell

b) Golgi apparatus - Discovered by Altman

c) Mitochondria - Name was given by Benda

d) Lysosomes - Discovered by de Duve

70. Arrangement of microtubules in a flagellum and a centriole is respectively

- a) $9 + 2$ and $9 + 1$ b) $9 + 1$ and $9 + 0$ c) $9 + 0$ and $9 + 2$
d) $9 + 2$ and $9 + 0$.
71. Which of the following observations most strongly support the view that mitochondria contain electron transport enzymes aggregated into compact association?
- a) Mitochondria have a highly folded inner wall.
b)
Disruption of mitochondria yields membrane fragments, which are able to synthesise ATP.
c)
A contractile protein capable of utilising ATP has been obtained from mitochondria.
d)
Mitochondria in animal embryos have a tendency to concentrate in cells, which are to become locomotory structures.
72. Cell recognition and adhesion are facilitated by components of plasma membrane. These components are generally
- a) protein molecules alone b) lipids alone c) both lipids and proteins
d) glycolipids and glycoproteins
73. Nuclear membrane is absent in _____ .
- a) Penicillium b) Agaricus c) Volvox d) Nostoc
74. Which of the following pair of organelles does not contain DNA?
- a) Chloroplast and Vacuoles b) Lysosomes and Vacuoles
c) Nuclear envelope and Mitochondria d) Mitochondria and Lysosomes
75. Which is the best way to separate intact chloroplast from green leaves of angiospermic plant?
- a) Petrol-ether b) Chloroform c) 10% sucrose solution d) Alcohol
76. Continuity of cytoplasm from cell to cell is maintained through cytoplasmic connections in plants called
- a) ER b) tight junction c) gap junction d) plasmodesmata
77. Assertion: Cells vary greatly in their shape
Reason: The shape of cell does not depend on the function they perform.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

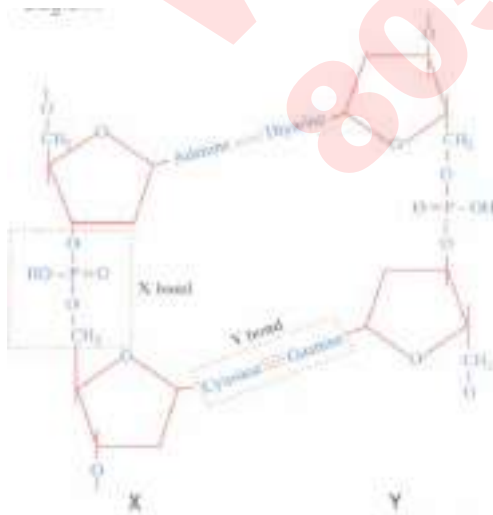
c) If assertion is true but reason is false

d) If both assertion and reason are false.

WHATSAPP
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**Ravi Maths Tuition Centre****Time : 1 Mins****BIOMOLECULES 1****Marks : 1376**

1. The essential chemical components of many coenzymes are:
a) Nucleic acids b) Carbohydrates c) Vitamins d) Proteins
2. The sum total composition of acid-soluble and acid insoluble fraction represents the entire composition of
a) cellular pool b) gene library c) dead cells d) gene pool
3. Which is least likely to be involved in stabilising the three dimensional folding of most proteins?
a) Ester bonds b) Hydrogen bonds c) Electrostatic interactions
d) Hydrophobic interactions
4. Example of phospho protein is-
a) Mucin b) Fibrinogen c) Casein d) Myosin
5. Which monosaccharide does not show optical isomerism?
a) Dihydroxy acetone b) Glyceraldehyde c) Erythrose d) Ribose
6. Which bonds are indicated by X and Y in the given diagram?



a)

X	Y
Glycosidic bond	Hydrogen bond

b)

X	Y
Phosphodiester bond	Hydrogen bond

c)

X	Y
Glycosidic bond	Phosphodiester bond

d)

X	Y
Phosphodiester bond	Glycosidic bond

7. Water is important for the body of animals in:-

- a) Reproduction b) Keeping the body only warm c) Working as solvent
d) All of them

8. Read the given statements and select the option that correctly sorts these with respect to A and B in the given flow chart.



- (i) Molecular weight ranging from 18 to 800 daltons (Da) approximately
(ii) Proteins, nucleic acids, polysaccharides and lipids
(iii) Contain chemicals that have molecular weight more than 800 Da
(iv) Has monomers
(v) Generally has polymers

a)

A	B
(i),(ii),(iii)	(iv),(v)

b)

A	B
(ii),(iv)	(i),(iii),(v)

c)

A	B
(i),(iv)	(ii),(iii),(v)

d)

A	B
(i),(iii),(v)	(ii),(iv)

9. What will be the molecular formula of a polypeptide consisting of 10 glycine molecules when the formula of glycine is $C_2H_5O_2N$?

- a) $C_6H_{12}ON_5$ b) $C_{20}H_{32}O_{11}N_{10}$ c) $C_{30}H_{16}O_6N_{10}$ d) $C_{25}H_{16}O_6N_5$

10. Which element is normally absent in proteins?

- a) C b) N c) S d) P

11. The chitinous exoskeleton of arthropods is formed by the polymerisation of:

- a) Lipoglycans b) Keratin sulphate and Chondroitin glucosamine
c) D-glucosamine d) N-acetyl glucosamine

12. Which one of the following is a non-reducing carbohydrate _____ .
 a) Maltose b) Sucrose c) Lactose d) Ribose 5 - phosphate
13. Holoenzyme is the complete enzyme consisting of an apoenzyme and a co-factor. Select the option that correctly identifies the nature of apoenzyme and co-factor
- a)
- | | |
|-----------|-------------|
| Apoenzyme | Co-factor |
| Protein | Non-protein |
- b)
- | | |
|-------------|-----------|
| Apoenzyme | Co-factor |
| Non-protein | Protein |
- c)
- | | |
|-----------|-----------|
| Apoenzyme | Co-factor |
| Protein | Protein |
- d)
- | | |
|-------------|-------------|
| Apoenzyme | Co-factor |
| Non-protein | Non-protein |
14. In an organism DNA, which is double stranded 17% of the bases were shown to be cytosine percentage of the other three bases expected present in this DNA are:-
 a) G-17%, A-16.5%, T-32.5% b) G-17%, A-33%, T-33%
 c) G-8.5%, A-50%, T-24.5% d) G-34%, A-24.5%, T-24.5%
15. Lipids are insoluble in water because lipid molecules are _____.
 a) Hydrophilic b) Hydrophobic c) Neutral d) Zwitter ions
16. Which of the following is a triglyceride?
 a) Wax b) Phospholipid c) Oil d) Steroid
17. Carbohydrates are stored in mammals as:
 a) Glucose in liver b) Glycogen in muscles and spleen
 c) Lactic acid in muscles d) Glycogen in liver and muscles
18. Cellulose, the most important constituent of plant cell wall is made of _____ .
 a) Unbranched chain of glucose molecules linked by α 1,4-glycosidic bonds
 b) Branched chain of glucose molecules linked by β 1, 4- glycosidic bond in straight chain and α 1, 6-glycosidic bond at the site of branching
 c) Unbranched chain of glucose molecules linked by β 1, 4-glycosidic bond
 d) Branched chain of glucose molecules linked by α 1, 6- glycosidic bond at the site of branching.
19. One of the characteristics of DNA is-

- a) Uracil b) Deoxyribose sugar c) Single stranded
d) Ability of protein synthesis
20. Which of the following biomolecules does have phosphodiester bond?
a) Monosaccharides in a polysaccharide b) Amino acids in a polypeptide
c) Nucleic acids in a nucleotide d) Fatty acids in a diglyceride
21. **Assertion:** The protein part of the enzyme is called apoenzyme and non-protein part of the enzyme is called co-factor.
Reason: Zinc is a co-factor for the proteolytic enzyme carboxypeptidase.
- a)
If both assertion and reason are true but reason is not the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false
22. **Assertion:** A protein is a heteropolymer.
Reason: Dietary proteins are the source of non-essential amino acids.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false
23. **Assertion:** The long protein chain is folded upon itself like a hollow ball giving rise to the tertiary structure.
Reason: Tertiary structure gives a 3-dimensional view of a protein
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

24. **Assertion:** Hydrolases are the enzymes which catalyse the hydrolysis of ester, ether, peptide, glycosidic, C-C or P-N etc., bonds.

Reason: Lyases are the enzymes catalysing the linking together of 2 compounds like joining of C-O, C-N, P - O etc. bonds.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

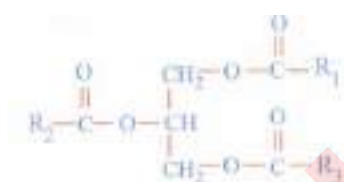
b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

25. Given molecular formula belongs to which of the following groups of biomolecules?



a) Carbohydrates b) Proteins c) Nucleic acids d) Triglycerides

26. Biochemical reagents are widely used for detection of biomolecules. A reagent that specifically detects a carbonyl group ($C=O$) in a biomolecule will yield a positive test with

a) protein b) fatty acid c) carbohydrate d) all of these

27. The regulation by an organism of chemical composition of its blood and body fluids and other aspects of its internal environment so that physiological processes can proceed at optimum rates is called

a) metabolism b) enthalpy c) entropy d) homeostasis

28. The inorganic compounds like sulphate, phosphate, etc., are found in

a) acid-soluble pool b) acid-insoluble fraction c) both (a) and (b)
d) none of these.

29. Two free ribonucleotide units are interlinked with _____.

a) Peptide bond b) Covalent bond c) Hydrogen bond
d) Phosphodiester bond

30. A segment of DNA has 120 adenine and 120 cytosine bases. The total number of nucleotides present in the segment is _____ .

- a) 120 b) 240 c) 60 d) 480

31. In RNA, thymine is replaced by _____ .

- a) Adenine b) Guanine c) Cytosine d) Uracil

32. In which from the extra Sugar is stored in the body?

- a) Glucose monosaccharide b) Sucrose Disaccharide
c) Glycogen polysaccharide d) Fatty acid and glycerol

33. Refer to the given reactions

(i) Adenine + X \rightarrow Adenosine

(ii) Adenosine + Y \rightarrow Adenylic acid

What does X and Y represent here?

a)

X	Y
Phosphate group	Sugar molecule

b)

X	Y
Sugar molecule	Phosphate group

c)

X	Y
Sugar molecule	Nitrogenous base

d)

X	Y
Nitrogenous base	Sugar molecule

34. Which of the following sugar is found in ATP?

- a) Deoxyribose b) Ribose c) Trehalose d) Glucose

35. Sugar found in haemolymph of insects is called-

- a) Maltose b) Lactose c) Trehalose d) Galactose

36. **Assertion:** Coenzyme nicotinamide adenine dinucleotide (NAD) and NADP contain a vitamin.

Reason: The association of co-enzyme with apoenzyme is enduring.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

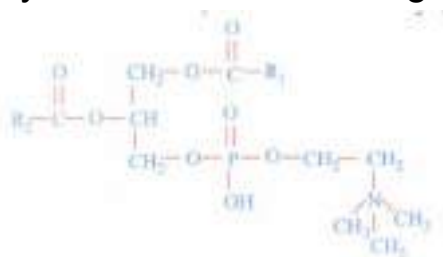
b)

If both assertion and reason are true but reason is not the correct explanation of assertion

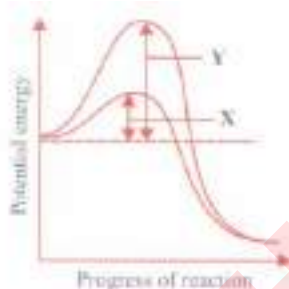
c) If assertion is true but reason is false

d) If both assertion and reason are false

37. Given structural formula is correctly identified along with Its related function by which of the following options?



- a) Cholesterol - A component of animal cell membrane
 b) Lecithin - A component of cell membrane
 c) Triglyceride - An energy source
 d) Adenosine - A component of nucleic acids
38. Which one of the following statements is wrong?
 a) Glycine is a sulphur containing amino acid b) Sucrose is a disaccharide
 c) Cellulose is a polysaccharide d) Uracil is a pyrimidine
39. What is denoted by X and Y in the given graph?



a)

X	Y
Activation energy without enzyme	Activation energy with enzyme

b)

X	Y
Activation energy with enzyme	Activation energy without enzyme

c)

X	Y
Substrate concentration with enzyme	Substrate concentration without enzyme

d)

X	Y
Substrate concentration without enzyme	Substrate concentration with enzyme

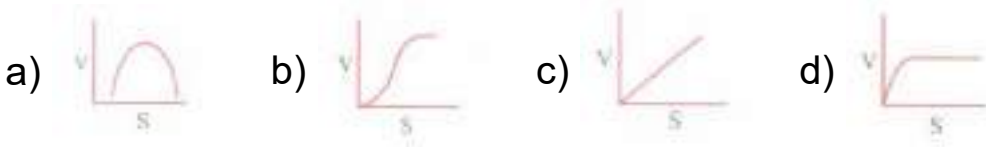
40. Mineral associated with cytochrome is _____.

- a) Cu b) Mg c) Fe and Mg d) Fe and Cu

41. Collagen is _____.

a) Fibrous protein b) Globular protein c) Lipid d) Carbohydrate

42. Which of the following graphs shows the relationship between the rate of an enzymatic activity (V) and substrate concentration (S)?



43. Monosaccharide, include:-

a) Pentose Sugar b) Hezose Sugar c) Only Glucose d) All of the above

44. Lecithin is a _____ .

a) sterol b) glycolipid c) phospholipid d) sphingolipid

45. Macromolecule chitin is:

a) Phosphorus containing polysaccharide
b) Sulphur containing polysaccharide c) Simple polysaccharide
d) Nitrogen containing polysaccharide

46. Which is odd:-

a) Chiltin-Carbohydrates b) Pectin-Protein c) Steroid-Lipid d) Wax-Lipid

47. Given structural formula is correctly identified along with its related function by which of the following options?



a) Cholesterol- A component of animal cell membrane
b) Lecithin - A component of cell membrane
c) Triglyceride - An energy source
d) Adenosine - A component of nucleic acids

48. Dipetide is-

a) Structure of two peptide bonds
b) Two amino acids linked by one peptide bond
c) Bond between one amino acid and one peptide d) None

49. Which is wrong about nucleic acids?

a) DNA is single stranded in some viruses
b) RNA is double stranded occasionally
c) Length of one helix is 45 Å in B-DNA
d) One turn of Z-DNA has 12 bases

50. Glycogen is-

- a) Polymer of amino acids b) Polymer of fatty acids c) Unsaturated fats
d) Polymer of glucose

51. Read the given statements.

- (i) Fructose is the sweetest sugar.
(ii) Glycine is the simplest amino acid.
(iii) Lactose is a disaccharide composed of one molecule each of glucose and galactose.
(iv) Cellulose is an unbranched chain of glucose molecules linked by β -1, 4-glycosidic bond.

Which of the given statements are correct?

- a) (i) and (ii) b) (iii) and (iv) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)

52. Which one of the given graphs shows the effect of pH on the velocity of a typical enzymatic reaction (V)?



53. Which is not consistent with double helical structure of DNA?

- a) $A=T$, $C=G$ b) Density of DNA decreases on heating
c) $A + T/C + G$ is not constant d) Both (a) and (b)

54. Antiparallel strands of a DNA molecule means that _____ .

a)

The phosphate' groups of two DNA strands, at their ends, share the same position.

b)

The phosphate groups at the start of two DNA strands are in opposite position (pole).

- c) One strand turns clockwise. d) One strand turns anti-clockwise.

55. **Assertion:** Most of the chemical reactions do not start automatically.

Reason: Reactant molecules have an energy barrier to become reactive.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

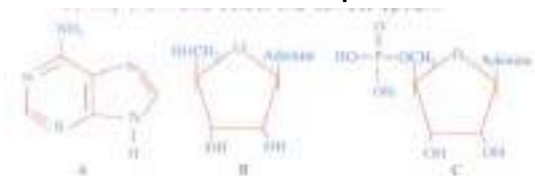
If both assertion and reason are true but reason is not the correct explanation of assertion

- c) If assertion is true but reason is false
d) If both assertion and reason are false
56. Biomolecules are
a) inorganic materials b) organic materials
c) all the carbon compounds obtained from living tissues
d) only DNA and RNA
57. Sweetest sugar among the naturally occurring sugar-
a) Glucose b) Fructose c) Sucrose d) Saccharine
58. In which one of the following enzymes, is copper necessarily associated as an activator?
a) Carbonic anhydrase b) Tryptophanase c) Lactic dehydrogenase
d) Tyrosinase
59. Amylose and Amylopectin chains occur in-
a) Glycogen b) Starch c) Cellulose d) Chitin
60. Which is not a polysaccharide?
a) Sucrose b) starch c) Glycogen d) cellulose
61. The proteinaceous molecule that joins a non-protein prosthetic group to form a functional enzyme, is called
a) apoenzyme b) co-factor c) holoenzyme d) isoenzyme
62. A N_2 - base together with pentose sugar and phosphate forms:-
a) Nucleoside b) Polypeptide c) Nucleotide d) Aminoacid
63. Dihydroxyacetone- 3-phosphate and glyceraldehyde- 3- phosphate are interconvertible. The enzyme responsible for this interconversion belongs to the category of
a) isomerases b) ligases c) lyases d) hydrolases
64. Which biomolecule is correctly characterised?
a) Lecithin - phosphorylated glyceride found in cell membrane.
b) Palmitic acid - unsaturated fatty acid with 18 carbon atoms.
c) Adenylic acid - adenosine with glucose phosphate molecule.
d)
Alanine amino acid - contains an amino acid and an acidic group anywhere in the molecule.
65. +ve and -ve charge are present in equal amount on any amino acid, that pH is:-

- a) Always acidic b) Always basic c) Isoelectric point
d) Amphipathic point
66. At some points a protein molecule may be folded back on itself. This is called _____ structure and folds or coils are held together in place by _____.
a) 2°, H-bonds b) 2°, peptide bonds c) 3°, H-bonds
d) 1°, peptide bonds
67. In double helix of DNA, the two DNA strands are _____.
a) Coiled around a common axis b) Coiled around each other
c) Coiled differently d) Coiled over protein sheath
68. Most abundant organic compound on earth is _____.
a) Protein b) Cellulose c) Lipids d) Steroids
69. A competitive inhibitor of succinic dehydrogenase is _____.
a) Malonate b) Oxaloacetate c) m-ketoglutarate d) Malate
70. Zinc is a co-factor for proteolytic enzyme _____.
a) carboxypeptidase b) isocitrate c) fumarase d) all of these
71. A phosphoglycerate is always made up of:
a)
Only an unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
b)
A saturated or unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
c)
A saturated or unsaturated fatty acid esterified to a phosphate group which is also attached to a glycerol molecule.
d)
Only a saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
72. The proteins which hasten the rate of a given metabolic conversation are called
a) haemoglobins b) metabolites c) enzymes d) none of these
73. Most diverse macromolecules, found in the cell both physically and chemically are _____.
a) Proteins b) Carbohydrates c) Nucleic acids d) Lipids
74. Which of the following amino acid is essential is:-

- a) Alanine b) Glycine c) Tryptophan d) Tyrosine
75. Essential amino acids include
a) leucine b) valine c) tryptophan d) all of these
76. A homopolymer has only one type of building block called monomer repeated 'n' number of times. A heteropolymer has more than one type of monomer. Proteins are heteropolymers usually made of:
a) 20 types of monomer b) 40 types of monomer c) 30 types of monomer
d) only one type of monomer
77. Specificity of protein is due to:-
a) Types of amino acid b) Sequence of amino acid
c) Number of amino acid d) Quantity of amino acid
78. Select the option which is not correct with respect to enzyme action:
a)
Addition of a lot of succinate does not reverse inhibition of succinic dehydrogenase by malonate
b)
A non-competitive inhibitor binds the enzyme at a site distinct from that which binds the substrate
c) Malonate is a competitive inhibitor of succinic dehydrogenase
d) Substrate binds with enzyme at its active site
79. Which one of the following statements is incorrect?
a)
The presence of the competitive inhibitor decreases the K_m of the enzyme for the substrate
b)
A competitive inhibitor reacts reversibly with the enzyme to form an enzyme-inhibitor complex.
c)
In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme
d)
The competitive inhibitor does not affect the rate of breakdown of the enzyme-substrate complex.
80. Smell in protoplasm is like:
a) NH_3 b) SO_2 c) Garlic d) None

81. The two polypeptides of human insulin are linked together by _____ .
a) Hydrogen bonds b) Phosphodiester bond c) Covalent bond
d) Disulphide bridges
82. Consider the following statement:
(A) Coenzyme or metal ion that is tightly bound to enzyme protein is called prosthetic group.
(B) A complete catalytic active enzyme with its bound prosthetic group is called apoenzyme. Select the correct option.
a) (A) is true but (B) is false. b) Both (A) and (B) are false.
c) (A) is false but (B) is true. d) Both (A) and (B) are true.
83. Glycogen is a homopolymer made up of
a) glucose units b) galactose units c) ribose units d) amino acids
84. Concanavalin A is _____.
a) An essential oil b) A lectin c) A pigment d) An alkaloid
85. **Assertion:** Each enzyme has a substrate binding site in its molecule which forms highly reactive enzyme-substrate complex.
Reason: The enzyme-substrate complex is long-lived and dissociates into its product and unchanged enzyme.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false
d) If both assertion and reason are false
86. For body growth and repair one need:-
a) Carbohydrates b) Fats c) Proteins d) Vitamins
87. The three structural formulae A, B and C are given here. Identify them and select the correct option.



a)

A	B	C
Adenine (N-base)	Adenosine (Nucleotide)	Adenylic acid (Nucleoside)

b)

A	B	C
Adenine (N-base)	Adenosine (Nucleotide)	Adenylic acid (Nucleoside)

c)

A	B	C
Adenosine (Nucleotide)	Adenylic acid (Nucleoside)	Adenine (N-base)

d)

A	B	C
Adenosine (Nucleotide)	Adenylic acid (Nucleoside)	Deoxyadenylic acid

88. Most simple amino acid is-

- a) Tyrosine b) Lysine c) Glycine d) Aspartic acids

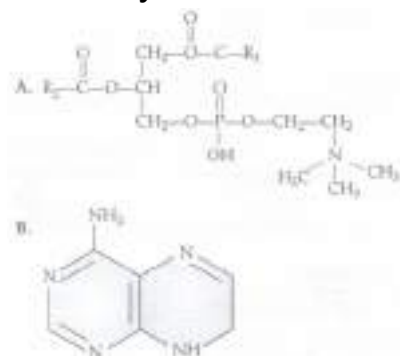
89. Which of the following statements is not correct regarding chitin?

- a) It is a storage polysaccharide b) It is a homopolysaccharide
c) It is a constituent of arthropod exoskeleton and fungal cell wall
d) It is the second most abundant carbohydrate on earth

90. The correct order of chemical composition of living tissues/cells in term of percentage of the total cellular mass is

- a) nucleic acids > proteins > H₂O > carbohydrates > Ions > lipids
b) H₂O > proteins > nucleic acids > carbohydrates > lipids > ions
c) H₂O > proteins > carbohydrates > nucleic acids > Lipids > ions
d) lipids > ions > carbohydrates > H₂O > proteins nucleic acids

91. Which one of the following structural formulae of two organic compound is correctly identified along with the related function.



a) A: Lecithin: a component of cell membrane

b) B: Adenine: a nucleotide that makes up nucleic acids

- c) A: Triglyceride: major source of energy
d) B: Uracil: a component of DNA
92. Mitochondrial DNA is-
a) Naked b) Circular c) Double stranded d) All the above
93. Read the given statements and select the correct option.
Statement 1: Co-factors play a crucial role in the catalytic activity of the enzyme.
Statement 2: Catalytic activity is lost when co-factor is removed from the enzyme.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
94. Number of H-bonds between guanine and cytosine are -
a) One b) Two c) Three d) Four
95. Properties of starch useful for making it storage material are:
(i) Easily translocated
(ii) Chemically non-reactive
(iii) Easily digestible
(iv) Osmotically inactive
(v) Synthesized during photosynthesis
a) (i) and (v) b) (ii) and (iii) c) (ii) and (iv) d) (iii) and (v)
96. The two functional groups characteristic of sugars are:
a) Carbonyl and Phosphate b) Carbonyl and methyl
c) Hydroxyl and methyl d) Carbonyl and hydroxyl
97. Which configuration of protein provide information only of sequence of amino acids?
a) Primary b) Secondary c) Tertiary d) Quaternary
98. In true solution, size of solute particles is:
a) Less than $0.001\ \mu$ b) $0.001\ \mu$ - $0.1\ \mu$ c) More than $0.1\ \mu$ d) None
99. Unit of nucleic acids are-
a) Phosphoric acid b) Nitrogenous bases c) Pentose Sugar
d) Nucleotides
100. Enzymes having slightly different molecular structure but performing identical activity are _____.

a) Homoenzymes b) Isoenzymes c) Apoenzymes d) Coenzymes

01. The most abundant chemical in living organisms could be
a) protein b) water c) sugar d) nucleic acid
02. If there are 10,000 nitrogenous base pairs in a DNA then how many nucleotides are there?
a) 500 b) 10,000 c) 20,000 d) 40,000
03. In India the best source of proteins for vegetarian person is-
a) Pulses b) Potato c) Egg d) Meat
04. Which of the following biomolecules have phospho diester bonds?
a) Fatty acids in diglyceride b) Monosaccharides in a polysaccharide
c) Amino acid in a polypeptide d) Nucleotides in a nucleic acid
05. Study the given data and answer the question that follow.

A sample of an enzyme called lactase was isolated from the intestinal lining of a calf. Assays were undertaken to evaluate the activity of the enzyme sample.

The substrate of lactase is the disaccharide lactose. Lactase breaks a lactose molecule in two, producing a glucose molecule and a galactose molecule.

Two assays were carried out

Assay 1

Lactose concentration (% w/v)	15	15	15	15	15	15
Concentration of enzyme sample (% v/v)	0	5	10	15	20	25
Reaction rate $\mu\text{mole glucose sec}^{-1} \text{ mL}^{-1}$	0	25	50	75	100	125

Assay 2

Lactose concentration (% w/v)	0	5	15	20	25	30
Concentration of enzyme sample (% v/v)	5	5	5	5	5	5
Reaction rate $\mu\text{mole glucose sec}^{-1} \text{ mL}^{-1}$	0	15	25	35	40	40

Which of the following assays would you expect to have the highest reaction rate?

a)

Lactose concentration (% w/v)	Concentration of enzyme sample (% v/v)
15	5

b)

Lactose concentration (% w/v)	Concentration of enzyme sample (% v/v)
30	5

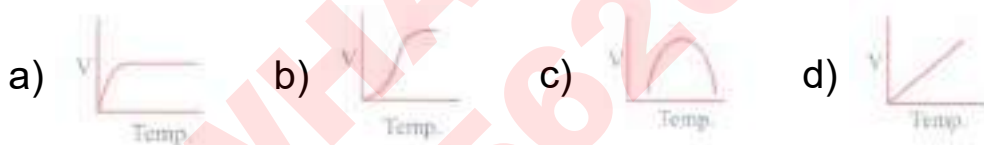
c)

Lactose concentration (% w/v)	Concentration of enzyme sample (% v/v)
15	25

d)

Lactose concentration (% w/v)	Concentration of enzyme sample (% v/v)
30	25

06. Which one of the given graphs shows the effect of temperature on the velocity of a typical enzymatic reaction?



07. Which of the following describes the given graph correctly?



a)

Endothermic reaction with energy A in presence of enzyme and B in absence of enzyme.

b)

Exothermic reaction with energy A in presence of enzyme and B in absence of enzyme.

c)

Endothermic reaction with energy A in absence of enzyme and B in presence of enzyme.

d)

Exothermic reaction with energy A in absence of enzyme and B in presence of enzyme.

08. Which of the following N base are pyrimidines?

a) T & C b) T & A c) A & C d) G & T

09. Which of the following is an example of isozyme

a) α -amylase b) Glucokinase c) Lactate dehydrogenase d) All of these

10. Which one of the following is the most abundant protein in the animals?

a) Lectin b) Insulin c) Haemoglobin d) Collagen

11. The helical structure of protein is stabilized by

a) dipeptide bonds b) hydrogen bonds c) ether bonds d) peptide bonds

12. Which of the following are not polymeric?

a) Nucleic acids b) Proteins c) Polysaccharides d) Lipids

13. The four elements making 99% of living system are _____.

a) CHOS b) CHOP c) CHON d) CNOP

14. Study the given statements and select the correct answer.

(i) Cellulose is a homopolymer of glucose.

(ii) Inulin is a homopolymer of fructose.

(iii) Starch gives blue colour and glycogen gives red colour with iodine solution.

(iv) Cellulose gives no colour with iodine solution.

a) Statements (i), (ii) and (iii) are correct

b) Statements (i), (ii) and (iv) are correct

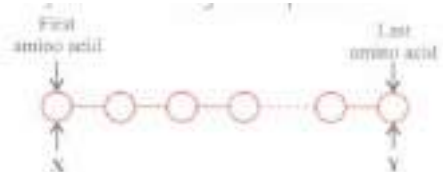
c) Statements (ii) and (iii) are correct d) All statements are correct

15. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Tetrose sugar	(i) Galactose
B. Pentose sugar	(ii) Maltose
C. Hexose sugar	(iii) Erythrose
D. Disaccharide	(iv) Ribose
	(v) Sedoheptulose

- a) A-(v); B-(iv); C-(iii); D-(i), (ii) b) A-(iii); B-(iv); C-(v); D-(ii)
c) A-(iii); B-(iv); C-(i); D-(ii) d) A-(i), (ii); B-(iv); C-(iii); D-(v)
16. An organic substance bound to an enzyme and essential for its activity is called _____.
a) Holoenzyme b) Apoenzyme c) Isoenzyme d) Coenzyme
17. The basic unit of nucleic acid is _____.
a) Pentose sugar b) Nucleoid c) Nucleoside d) Nucleotide
18. The 20 different amino acids have different:
a) R-groups b) carboxylic groups c) peptide bonds d) amino groups
19. Cytidine is a
a) nitrogenous base b) nucleoside c) nucleotide d) nucleic acid
20. Transition state structure of the substrate formed during an enzymatic reaction is:
a) Permanent but unstable b) Transient and unstable
c) Permanent and stable d) Transient but stable
21. The inhibitor which closely resembles the substrate in its molecular structure and inhibits the enzyme activity by binding to the active site of the enzyme is called
a) feedback inhibitor b) non-competitive inhibitor c) competitive inhibitor
d) allosteric modulator
22. A polysaccharide, which is synthesised and stored in liver cells is _____.
a) Lactose b) Galactose c) Arabinose d) Glycogen
23. Which is a disaccharide?
a) Galactose b) Galactose c) Maltose d) Dextrin
24. One of the major components of cell wall of the fungi is:-
a) Cellulose b) Hemicellulose c) Chitin d) Peptidoglycan
25. What is common among amylase, rennin and trypsin?
a) These are all proteins b) These are proteolytic enzymes
c) These are produced in stomach d) These act at a pH lower than 7
26. Number of chiral carbons in β -D-(+)- glucose is
a) five b) six c) three d) four
27. Double helix model of DNA which was proposed by Watson and Crick was of-
a) C-DNA b) B-DNA c) D-DNA d) Z-DNA

28. Nails, horns and hoofs contain-
- a) Chitin b) Keratin c) Both d) None
29. Identify X and Y in the given sequence.



a)

X	Y
N-terminal amino acid	C-terminal amino acid

b)

X	Y
N-terminal amino acid	N-terminal amino acid

c)

X	Y
C-terminal amino acid	N-terminal amino acid

d)

X	Y
C-terminal amino acid	C-terminal amino acid

30. Study the given data and answer the question that follow.

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Assay 2

Lactose concentration (% w/v)	0	5	15	20	25	30
Concentration of enzyme sample (% v/v)	5	5	5	5	5	5
Reaction rate $\mu\text{mole glucose sec}^{-1} \text{ mL}^{-1}$	0	15	25	35	40	40

What are the variables in each of the two assays?

a)

Assay 1	Assay 2
Lactose concentration	Concentration of enzyme sample

b)

Assay 1	Assay 2
Concentration of enzyme sample	Lactose concentration

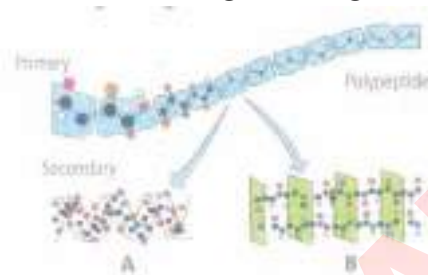
c)

Assay 1	Assay 2
Lactose concentration	Lactose concentration

d)

Assay 1	Assay 2
Concentration of enzyme sample	Concentration of enzyme sample

31. Refer to the given figure.



Formation of structures A and B could be due to

a)

A	B
Formation of peptide bonds	Linking together of two or more polypeptides

b)

A	B
Formation of hydrogen bonds	Linking together of two or more polypeptides

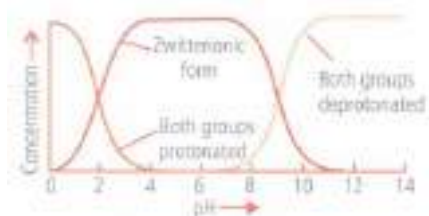
c)

A	B
Formation of hydrogen bonds	Formation of hydrogen bonds

d)

A	B
Formation of peptide bonds	Formation of peptide bonds

32. Maximum percentage of which component is present in cotton?
a) Protein b) Carbohydrate c) Lipid d) All are same
33. DNA was first discovered by-
a) Meischer b) Robert Brown c) Flemming d) Watson & Crick
34. Which of the following is not a polymer?
a) Starch b) Nucleic acid c) Maltose d) Protein
35. RNA does not possess _____.
a) Uracil b) Thymine c) Adenine d) Cytosine
36. Percentage of water in animal body is-
a) 20% b) 65% c) 55% d) 15%
37. Which of the following are alkaloids?
a) Cellulose b) Codeine c) Morphine d) Both (b) and (c)
38. Adenosine, guanosine, thymidine, uridine, cytidine are all ____ but adenylic acid, guanylic acid, uridylic acid, cytidylic acid are ____
a) nucleotides, nucleosides b) nucleosides, nucleotides
c) nucleotides, nucleic acids d) nucleosides, nucleic acids
39. A typical fat molecule is made up of :
a) Three glycerol and three fatty acid molecules
b) Three glycerol molecules and one fatty acid molecule
c) One glycerol and three fatty acid molecules
d) One glycerol and one fatty acid molecule
40. Which of the following sugars have the same number of carbon as present in glucose?
a) Fructose b) Erythrose c) Ribulose d) Ribulose
41. Refer to the given graph showing state of ionisation of zwitterion.



Select the correct statements regarding zwitterion.

- (i) Zwitterions can be formed from compounds that contain both acid groups and basic groups in their molecules.
- (ii) A zwitterion can act either as proton donor or proton acceptor.
- (iii) A monoamine monocarboxylic α -amino acid is a acid at high pH as both the groups (amino and carboxyl) lose a proton.

- (iv) Amino acids in solution at neutral pH exist predominantly as dipolar ions, the amino group is protonated ($-\text{NH}_3$) and the carboxyl group is deprotonated ($-\text{COO}^-$).
- a) (iii) and (iv) b) (i), (ii), (iii) and (iv) c) (i) and (ii) d) (i), (ii) and (iii)
42. Which of the following statements is incorrect regarding enzymatic activity?
- a) It initially increases with increase in temperature and then decreases
b) It increases with increase in substrate concentration upto the saturation point
c) It is highest at optimum pH value
d) It initially decreases with increase in pH value
43. It is said that elemental composition of living organisms and that of inanimate objects (like earth's crust) are similar in the sense that all the major elements are present in both. Then what would be the difference between these two groups?
Choose a correct answer from the following.
- a) Living organisms have more gold in them than inanimate objects.
b) Living organisms have more water in their body than inanimate objects.
c) Living organisms have more carbon, oxygen and hydrogen per unit mass than inanimate objects
d) Living organisms have more calcium in them than inanimate objects
44. Which is most important structural part of the body?
- a) Protein b) Carbohydrates c) Lipid d) Nucleic acid
45. Which of the following reactions is not enzyme-mediated in biological system?
- a) Dissolving CO_2 in water b) Unwinding the two strands of DNA
c) Hydrolysis of sucrose d) Formation of peptide bond
46. Variations in proteins are due to -
- a) Sequence of amino acids b) Number of amino acids c) R-group
d) None
47. Living cell contains 60-75% water. Water present in human body is _____.
- a) 60-65% b) 50-55% c) 75-80% d) 65-70%

48. Read the given statements and select the correct option.

Statement 1: Ribozymes are RNA molecules which catalyse the synthesis of certain specific RNAs and removal of introns from mRNA.

Statement 2: Ribozymes are proteinaceous enzymes.

- a) Both statements 1 and 2 are correct
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct
- d) Both statements 1 and 2 are incorrect

49. Which one contains four pyrimidine bases?

- a) GATCAATGC b) GCUAGACAA c) UAGCGGUAA d) TGCCTAACG

50. Match the column-I with column-II and choose correct option:-

Column-I		Column-II
A Insulin	i	Fights infectious agents
B Antibody	ii	Enables glucose transport into cells
C Receptor	iii	Hormone
D GLUT-4	iv	Sensory reception

- a) A-iii, B-ii, C-iv, D-i b) A-iii, B-i, C-iv, D-ii c) A-i, B-ii, C-iii, D-iv
- d) A-ii, B-iii, C-iv, D-i

51. Nucleic acids are polymer of -

- a) Nucleotides b) Nucleosides c) Amino acids d) Nitrogen bases

52. Spoilage of oil can be detected by which fatty acid?

- a) Oleic acid b) Linolenic acid c) Linoleic acid d) Erucic acid

53. Which sugar occurs in haemolymph of insects?

- a) Chondriotin b) Heaparin c) Trehalose d) Maltose

54. Which of the following statements about amino acids is incorrect?

a)

Essential amino acids are not synthesised in the body, therefore have to be provided in the diet

b) Leucine, isoleucine, lysine, valine are essential amino acids

c) Cysteine and methionine are sulphur containing amino acids

d) Lysine and arginine are acidic amino acids

55. An α -helix is the example of which type of protein structure?

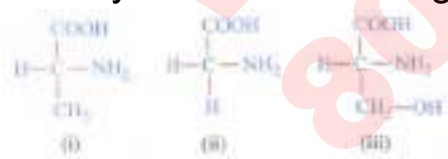
- a) Primary b) Secondary c) Tertiary d) Quaternary

56. Which type of configuration is shown by nucleic acids?

- a) Primary b) Secondary c) Tertiary d) Quaternary

57. Which substance is most abundant in cells?
a) Carbohydrates b) Protein c) Water d) Fats
58. Length of one loop of B-DNA is:-
a) 3.4 nm b) 0.34 nm c) 20 nm d) 10 nm
59. An enzyme brings about _____.
a) Decrease in reaction time b) Increase in reaction time
c) Increase in activation energy d) Reduction in activation energy
60. **Assertion:** Palmitic acid has 20 carbon atoms including carboxyl carbon.
Reason: Arachidonic acid has 16 carbon atoms including carboxyl carbon.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false
d) If both assertion and reason are false
61. Three of the following statements about enzymes are correct and one is wrong. Which one is wrong?
a) Enzymes require optimum pH for maximal activity
b)
Enzymes are denatured at high temperature but in certain exceptional organisms, they are effective even at temperatures 80°-90°C.
c) Enzyme are highly specific
d) Most enzymes are proteins but some are lipids
62. Which of the following is an incorrect match?
a) Purines - Adenine, guanine b) Pyrimidines - Cytosine, thymine
c) Structural polysaccharides - Inulin d) Storage polysaccharides - Starch
63. Wilkins X-ray diffraction showed the diameter of the DNA helix which is:-
a) 10 Å b) 20 Å c) 30 Å d) 40 Å
64. Which protein is found in maximum amount?
a) Catalase b) Carbonic anhydrase c) Transferase d) RUBISCO
65. Amino acids have both an amino group and a carboxyl group in their structure. Which amongst the following is an amino acid?
a) Formic acid b) Glycerol c) Glycolic acid d) Glycine

66. In which one of the following groups, all the three are examples of polysaccharides?
 a) Starch, glycogen, cellulose b) Sucrose, maltose, glucose
 c) Glucose, fructose, lactose d) Galactose, starch, sucrose
67. Thymine is-
 a) 5-Methyl uracil b) 4-Methyl uracil c) 3-Methyl uracil d) 1-Methyl uracil
68. Which of the following is a saturated fatty acid?
 a) Oleic acid b) Linoleic acid c) Arachidonic acid d) Palmitic acid
69. Which of the following statements regarding enzyme inhibition is correct?
 a)
 Competitive inhibition is seen when a substrate competes with an enzyme for binding to an inhibitor protein.
 b)
 Competitive inhibition is seen when the substrate and the inhibitor compete for the active site on the enzyme.
 c)
 Non-competitive inhibition of an enzyme can be overcome by adding large amount of substrate.
 d) Non-competitive inhibitors often bind to the enzyme irreversibly.
70. Milk protein is-
 a) Casein b) Pepsin c) Lactogen d) Myosin
71. Identify the amino acids given below and select the correct option.



a)

(i)	(ii)	(iii)
Glycine	Serine	Alanine

b)

(i)	(ii)	(iii)
Alanine	Glycine	Serine

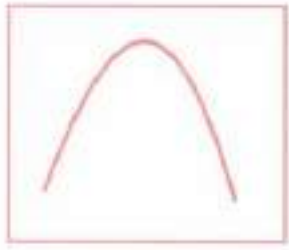
c)

(i)	(ii)	(iii)
Alanine	Serine	Glycine

d)

(i)	(ii)	(iii)
Serine	Alanine	Glycine

72. Select the right option regarding the given graph.



a)

X-axis	Y-axis
Rate of reaction	Enzymatic activity

b)

X-axis	Y-axis
Enzymatic activity	Rate of reaction

c)

X-axis	Y-axis
Enzymatic activity	pH/Temperature

d)

X-axis	Y-axis
pH/Temperature	Enzymatic activity

73. Carbohydrate are-

- a) Polymers of fatty acid b) Polymer of amino acids
c) Poly hydroxy aldehyde or ketone d) None

74. Keratin present in hair shows secondary structure known as

- a) parallel β -sheet b) antiparallel β -sheet c) α -helix d) none of these

75. Which sugar does not give Benedict's test?

- a) Glucose b) Maltose c) Fructose d) Sucrose

76. The number of 'ends' in a glycogen molecule would be

- a) equal to the number of branches plus one
b) equal to the number of branch points c) one
d) two, one on the left side and another on the right side

77. Which purine & pyrimidine bases are paired together by H-bonds in DNA?

- a) AC & GT b) GC & AT c) GA & TC d) None of the above

78. Which is sweet in taste, but is not a sugar?

- a) Starch b) Saccharine c) Lactose d) Protein

79. On an average, how many purine N base are present in single coil of DNA?

- a) Four b) Five c) Ten d) Uncertain

80. Pyrimidines have nitrogen atoms at _____ positions.

- a) 1', 3', 7', 9' b) 1', 5', 7', 9' c) 1', 3' d) 1', 9'

81. Primary structure of proteins is due to the presence of

- a) peptide bonds b) disulphide (S-S) linkages c) hydrogen bonds
d) ionic bonds

82. The standard free energy change and standard activation energy for four biochemical reactions are listed in the table below.

Reaction	Standard free energy change (kcal/mol)	Standard activation energy (kcal/mol)
P	-40	18
Q	-71	18
R	-40	11
S	-71	11

A few interpretations are given below. Among these, the most appropriate interpretation is

a)

P, Q, R and S represent the same reaction carried out in the presence of enzyme, high temperature, absence of enzyme and low temperature, respectively

b)

Q and S represent the same reaction carried out at high and low temperatures, respectively

c)

R and S represent the same reaction carried out in the presence and absence of catalyst, respectively

d)

P and R represent the same reaction carried out in the absence and presence of enzyme, respectively

83. Which of the following is not pyrimidine N-base?

a) Thymine b) Cytosine c) Guanine d) Uracil

84. Inhibition of succinate dehydrogenase by malonate is an example of

a) non-competitive inhibition b) competitive inhibition
c) allosteric inhibition d) negative feedback

85. In DNA, purine nitrogen bases are:-

a) Uracil and Guanine b) Guanine and Adenine
c) Adenine and cytosine d) None

86. Which of the following glucose transporters is insulin-dependent?

a) GLUT-II b) GLUT-III c) GLUT-IV d) GLUT-I

87. Match the column I with column II and choose the correct combination from the options given.

	Column I (Component)		Column II (% of the total cellular mass)
A.	Ions	(i)	1
B.	Lipids	(ii)	2
C.	Carbohydrates	(iii)	3
D.	Nucleic acids	(iv)	5-7
E.	Proteins	(v)	10-15

a) A-(i), B-(ii), C-(iii), D-(iv), E-(v) b) A-(ii), B-(iii), C-(i), D-(v), E-(iv)

c) A-(iii), B-(i), C-(ii), D-(iv), E-(v) d) A-(iv), B-(ii), C-(iii), D-(v), E-(i)

88. Translocation of sugars in flowering plants occur in the form of-

a) Glucose b) Sucrose c) Fructose d) Maltose

89. Acidic amino acids have two -COOH groups and one -NH₂ group per molecule. Select the pair that consists of acidic amino acids

a) Aspartic acid, glutamic acid b) Lysine, arginine c) Glycine, alanine
d) Both (a) and (b)

90. Which one of the following statements is correct, with reference to enzymes?

a) Apoenzyme = Holoenzyme + Coenzyme
b) Holoenzyme = Apoenzyme + Coenzyme
c) Coenzyme = Apoenzyme + Holoenzyme
d) Holoenzyme = Coenzyme + Cofactor

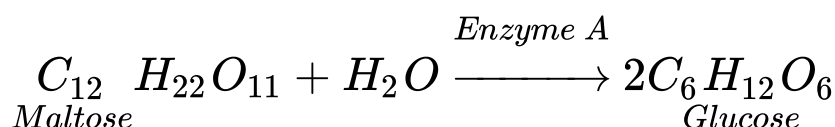
91. Chemically enzymes are:-

a) Fats b) Carbohydrates c) Hydrocarbons d) Proteins

92. An unknown liquid collected from a sample of peas, is added to a beaker of water and is vigorously shaken. After few minutes, water and the unknown liquid made two separate layers. To which class of biomolecules, does the unknown liquid most likely belongs?

a) Polysaccharides b) Proteins c) Lipids d) Enzymes

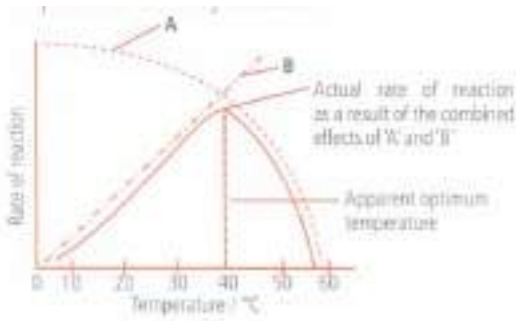
93. Refer to the given reaction



Enzyme A used in the reaction, belongs to which class of enzymes

a) Dehydrogenases b) Transferases c) Hydrolases d) Lyases

94. Refer to the given graph showing relationship between temperature and enzyme action.

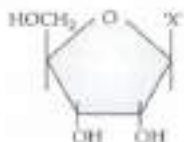


Select the correct statement regarding 'A' and 'B'.

- (i) 'A' shows rate at which reaction decreases due to denaturation of enzyme molecules.
 - (ii) 'B' shows rate at which reaction increases due to decreased kinetic energy of substrate.
 - (iii) As temperature rises, more and more enzyme molecules are denatured and 'A' appears to fall.
 - (iv) 'B' shows rate at which reaction increases due to increased kinetic energy of substrate and enzyme molecules.
- a) (i), (iii) and (iv) b) (iii) only c) (iii) and (iv) only d) (i) and (ii) only
95. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called _____.
- a) Biodegradation b) Biopiracy c) Bio-infringement d) Bioexploitation
96. Back bone in structure of DNA molecule is made up of-
- a) Pentose Sugar and phosphate b) Hexose sugar and phosphate
c) Purine and pyrimidine d) Sugar and phosphate
97. DNA is not present in -
- a) Mitochondria b) Chloroplast c) Bacteriophage d) TMV
98. Which of the following biomolecules is common to respiration-mediated breakdown of fats, carbohydrates and proteins?
- a) Glucose-6-phosphate b) Fructose 1, 6-bisphosphate c) Pyruvic acid
d) Acetyl CoA
99. Saturated fatty acids possess _____ bonds between carbon atoms and are _____ at room temperature.
- a) single, solids b) double, solids c) single, liquids d) double, liquids
100. In the DNA of an animal percentage of Adenine is 30, then percentage of Guanine will be-

- a) 40 b) 30 c) 20 d) 70
- !01. Most abundant enzyme is:
a) RubisCO b) Catalase c) Invertase d) Nitrogenase
- !02. An example of aromatic amino acid is
a) tyrosine b) phenylalanine c) tryptophan d) all of these
- !03. Which of the following is not a part of enzyme but it activates the enzyme?
a) K b) C c) N d) Si
- !04. Which of the following ratio is generally constant for a given species?
a) $A+G / C+T$ b) $T+C / G+A$ c) $G+C / A+T$ d) $A+C / T+G$
- !05. Percentage of C, H & O is:-
a) More in earth crust than human body
b) More in human body than earth crust c) Similar in both
d) None of them
- !06. Proteins perform many physiological functions. For example, some proteins function as enzymes. One of the following represents an additional function that some proteins perform
a) antibiotics b) pigment conferring colour to skin
c) pigment making colours of flowers d) hormones
- !07. Which sugar occur only in mammals?
a) Trehalose b) Galactose c) Lactose d) Mannose
- !08. **Assertion:** The living state is an equilibrium steady state to be able to perform work.
Reason: Living process is a constant effort to prevent falling into non-equilibrium.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false
d) If both assertion and reason are false
- !09. Proteins present in protoplasm are very important because-
a) They provide definite shape to cell b) They function as biocatalyst
c) They yield energy d) They are stored food

- !10. **Assertion:** The heterocyclic compounds in nucleic acid are the nitrogenous bases.
Reason: Adenine and guanine are substituted pyrimidines while uracil, cytosine and thymine are substituted purines.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false
- !11. A nucleoside differs from a nucleotide in not having-
- a) Phosphate b) Sugar c) Phosphate & sugar d) Nitrogen base
- !12. Carbohydrates, the most abundant biomolecules on earth, are produced by:
- a) Some bacteria, algae and green plant cells.
b) Fungi, algae and green plant cells. c) All bacteria, fungi and algae.
d) Viruses, fungi and bacteria.
- !13. Physical basis of life is:-
- a) Cytoplasm b) Protoplasm c) Nucleoplasm d) Endoplasm
- !14. Which of the following secondary metabolites are used as drugs?
- a) Abrin and ricin b) Vinblastin and curcumin c) Anthocyanins
d) Gums and cellulose
- !15. To get quick energy one should use-
- a) Carbohydrate b) Fats c) Vitamins d) Proteins
- !16. Guanylic acid also termed as:-
- a) Guanine monophosphate b) Guanosine monophosphate
c) Ribonucleoside d) Deoxyribonucleoside
- !17. B-DNA which is right-handed double helix contains _____ base pairs per turn of the helix and each turn is _____ long.
- a) 10, 3.4 Å b) 10, 34 Å c) 11, 20 Å d) 11, 34 Å
- !18. Given below is the diagrammatic representation of one of the categories of small molecular weight organic compounds in the living tissues. Identify the category shown and the one blank component 'X' in it,



a)

Category	Component
Nucleotide	Adenine

b)

Category	Component
Nucleoside	Uracil

c)

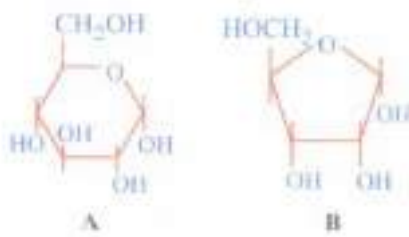
Category	Component
Cholesterol	Guanine

d)

Category	Component
Amino acid	NH ₂

- !19. Which of the following bond is not related to nucleic acid?
 a) H-bond b) Ester bond c) Glycosidic bond d) Peptide bond
- !20. Take a living tissue, grind it in trichloroacetic acid using pestle and mortar, and then strain it, you would obtain two fractions: acid-soluble and acid-insoluble fraction. Acid-insoluble fraction does not contain
 a) polysaccharides b) nucleic acids c) lipids d) flavonoids and alkaloids
- !21. Which one of the following statements about cytochrome 450 is wrong?
 a) It contains iron b) It is a coloured cell
 c) It has an important role in metabolism
 d) It is an enzyme involved in oxidation reactions
- !22. An organic substance essential for activity of an enzyme is :
 a) Apoenzyme b) Holoenzyme c) Isoenzyme d) Coenzyme
- !23. The most abundant protein in animal world is:
 a) Collagen b) Insulin c) Trypsin d) Haemoglobin
- !24. An acid soluble compound formed by phosphorylation of nucleoside is called
 a) nitrogen base b) adenine c) sugar phosphate d) nucleotide
- !25. The component present in both nucleotides and nucleosides is
 a) sugar b) phosphate c) nitrogenous base d) both (a) and (c).
- !26. The polysaccharides made up of glucose monomers are
 a) starch, glycogen, cellulose b) starch, inulin, peptidoglycan
 c) sucrose, lactose, maltose d) chitin, glycogen, starch

27. Which of the following options correctly identifies the structural formulae shown in figure?



a)

A	B
Fructose	Ribose

b)

A	B
Glucose	Deoxyribose

c)

A	B
Glucose	Ribose

d)

A	B
Glucose	Fructose

28. Circular and double stranded DNA occurs in -

- a) Golgibody b) Mitochondria c) Nucleus d) ER

29. Kinds of N bases in nucleic acids are -

- a) Three b) Four c) Five d) Eight

30. The purine & pyrimidine pairs of complementary strands of DNA are held together by-

- a) H-bonds b) O-bonds c) C-bonds d) N-bonds

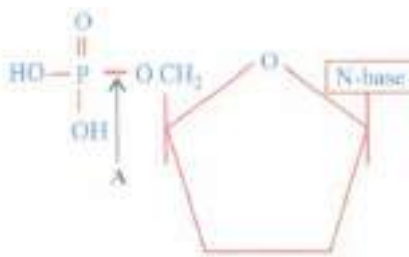
31. The introduction of T-DNA into plants involves:

- a) Altering the pH of the soil, then heat shocking the plants.
 b) Exposing the plants to cold for a brief period.
 c) Allowing the plant roots to stand in water.
 d) Infection of the plant by Agrobacterium tumefaciens.

32. Which element is not found in nitrogenous base?

- a) Nitrogen b) Hydrogen c) Carbon d) Phosphorus

33. What does A represent in the given diagram of a nucleotide?



- a) Glycosidic bond b) Phosphate bond c) Ester bond d) Ionic bond

34. Michaelis Menten Constant (K_m) is equal to

- a) the rate of reaction b) the rate of enzymatic activity
c)
substrate concentration at which the reaction attains half of its maximum velocity
d) substrate concentration at which the rate of reaction is maximum.
- !35. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalysed by _____.
a) Hexokinase b) Enolase c) Phosphofructokinase d) Aldolase
- !36. Which of the following will be different in different animals?
a) Fats b) Carbohydrates c) Proteins d) Vitamins
- !37. A β -pleated sheet organisation in a polypeptide chain is an example of
a) 1° structure b) 2° structure c) 3° structure d) 4° structure
- !38. Which one of the following is not applicable to RNA:
a) Chargaff's rule b) Complementary base pairing
c) 5' phosphoryl and 3' hydroxyl ends d) Heterocyclic nitrogenous bases
- !39. Watson & crick proposed the double helix model of DNA in:-
a) 1953 b) 1943 c) 1955 d) 1963
- !40. Which one of the following biomolecules is correctly characterised?
a) Lecithin - A phosphorylated glyceride found in cell membrane.
b) Palmitic acid - An unsaturated fatty acid with 18 carbon atoms.
c) Adenylic acid - Adenosine with a glucose phosphate molecule.
d)
Alanine amino acid - Contains an amino group and an acidic group anywhere in the molecule.
- !41. True statement for cellulose molecule is:-
a) β -1'-4" linkage, unbranched b) β -1'-4" linkage, branched
c) α -1'-4" linkage, branched d) β -1'-6" linkage, unbranched
- !42. The amino acids which are not synthesized in the body are called:
a) Non-essential b) Essential c) Proteins d) Vitamins
- !43. The four elements called "big-four" which make up 95% of all elements found in a living system are
a) C, H, O, N b) C, H, O, P c) C, H, O, S d) C, N, O, P
- !44. Identify the basic amino acid from the following
a) Lysine b) Valine c) Tyrosine d) Glutamic acid
- !45. Substance common in DNA and RNA-

- a) Hexose Sugar b) Histamine c) Thymine d) Phosphate groups
- !46. Which of the following disaccharide gives two molecules of glucose on hydrolysis?
a) Maltose b) Lactose c) (1) and (2) both d) Sucrose
- !47. Triglycerides are fatty acid esters of glycerol, which are formed by the esterification of _____ molecule(s) of fatty acids with _____ molecule(s) of glycerol.
a) one, two b) one, three c) three, one d) two, one
- !48. Which of the following nitrogen base is not found in DNA?
a) Thymine b) Cytosine c) Guanine d) Uracil
- !49. Purine bases of DNA are-
a) U & G b) A & G c) A & C d) None
- !50. DNA synthesis can be specifically measured by estimating the incorporation of radio labelled,
a) Uracil b) Adenine c) Thymidine d) Deoxyribose sugar
- !51. Enzymes catalyse the biochemical reactions by _____ the activation energy.
a) lowering b) increasing c) unaltering d) either (a) or (b)
- !52. Which of the following is the least likely to be involved in stabilizing the three-dimensional form for most proteins?
a) Hydrophobic interaction b) Ester bonds c) Hydrogen bonds
d) Electrostatic interaction
- !53. Cofactor (coenzyme) is a part of holoenzyme it is _____.
a) Loosely attached inorganic part
b) Accessory non-protein substance attached firmly
c) Loosely attached organic part d) None of the above
- !54. Which is distributed more widely in a cell?
a) DNA b) RNA c) Chloroplasts d) Sphaerosomes
- !55. The nitrogenous organic base purine occurring in RNA is _____.
a) Cytosine b) Thymine c) Guanine d) Uracil
- !56. Match column I with column II and select the correct option from the given codes.

Column I (Category)	Column II (Secondary metabolites)
A. Pigments	(i) Concanavalin A

Column I (Category)	Column II (Secondary metabolites)
B. Terpenoides	(ii) Monoterpenes, diterpenes
C. Alkaloids	(iii) Morphine, codeine
D. Lectins	(iv) Carotenoids, anthocyanins

- a) A-(iv), B-(ii), C-(iii), D-(i) b) A-(iv), B-(iii), C-(ii), D-(i)
 c) A-(i), B-(iv), C-(iii), D-(ii) d) A-(i), B-(iii), C-(ii), D-(iv)

!57. Which of the following is the correct match?

a)

Acidic amino acid	Basic amino acid	Neutral amino acid
Glutamic acid	Lysine	Valine

b)

Acidic amino acid	Basic amino acid	Neutral amino acid
Glutamic acid	Lysine	Valine

c)

Acidic amino acid	Basic amino acid	Neutral amino acid
Glutamic acid	Valine	Lysine

d)

Acidic amino acid	Basic amino acid	Neutral amino acid
Lysine	Glutamic acid	Valine

!58. Read the following statements and select the correct option.

Statement 1: All biomolecules have a turn over.

Statement 2: One type of biomolecule changes into some other type of biomolecule.

- a) Both statements 1 and 2 are correct
 b) Statement 1 is correct but statement 2 is incorrect
 c) Statement 1 is incorrect but statement 2 is correct
 d) Both statements 1 and 2 are incorrect

!59. Enzymes, vitamins and hormones can be classified into a single category of biological chemicals, because all of these _____ .

- a) Help in regulating metabolism.
 b) Are exclusively synthesised in the body of a living organism as at Present.
 c) Are conjugated proteins. d) Enhance oxidative metabolism.

!60. Feedback inhibition of an enzyme is influenced by

- a) enzyme itself b) external factors c) end product d) substrate.

!61. **Assertion:** All enzymes are not proteins

Reason: RNA molecules that possess catalytic activity are called ribozymes.

a) If assertion is true but reason is false

b) If both assertion and reason are false

c)

If both assertion and reason are true and reason is the correct explanation of assertion

d)

If both assertion and reason are true but reason is not the correct explanation of assertion

!62. ___ is the most abundant protein in animal world and ___ is the most abundant protein in the whole biosphere.

a) Collagen, RuBisCO b) Collagen, keratin c) Keratin, RuBisCO

d) Keratin, collagen

!63. All lipids are-

a) Composed of fatty acids b) Triglycerides c) Insoluble in water

d) All of the above

!64. Which one of the following is a polysaccharide?

a) Sucrose b) Lactose c) Glycogen d) Glucose

!65. Radioactive thymidine when added to the medium surrounding living mammalian cells gets incorporated into the newly synthesised DNA. Which of the following types of chromatin is expected to become radioactive if cells are exposed radioactive thymidine as soon as they enter the S-phase?

a) Heterochromatin b) Euchromatin c) Both (a) and (b)

d) Neither heterochromatin nor euchromatin but only the nucleous

!66. **Assertion:** Amino acids are called α -amino acids

Reason: Amino acids are organic compounds containing an amino group and an acidic group as substituents on the α -carbon.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

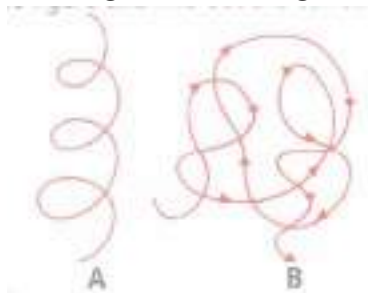
b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

- !67. In sol type colloidal solution, dispersion phase is:
a) Solid b) Liquid c) Gas d) None
- !68. Which one is the most abundant protein in the animal world.
a) Trypsin b) Haemoglobin c) Collagen d) Insulin
- !69. Enzymes are most functional within the temperature range of
a) 15 - 25°C b) 20 - 30°C c) 30° - 50°C d) 50 - 60°C
- !70. Recognise the figure and find out the correct matching.



- a) A-Primary structure, B-Secondary structure
b) A-Secondary structure, B-Primary structure
c) A-Secondary structure, B-Tertiary structure
d) A-Tertiary structure, B-Quaternary structure
- !71. Co-enzyme nicotinamide adenine dinucleotide (NAD) contains vitamin
a) thiamine b) niacin c) riboflavin d) none of these
- !72. Proteins are conducted in the body in the form:-
a) Amino acids b) Natural proteins c) Enzymes d) nucleic acids
- !73. **Assertion:** The inhibition of activity of succinic dehydrogenase by malonate which closely resembles the substrate succinate in structure is the example of competitive inhibition.
Reason: Competitive inhibition is the inhibition of enzyme activity when inhibitor closely resembles the substrate, in its molecular structure.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false
- !74. 98% of living body is formed of six elements - carbon, hydrogen, nitrogen, oxygen and:

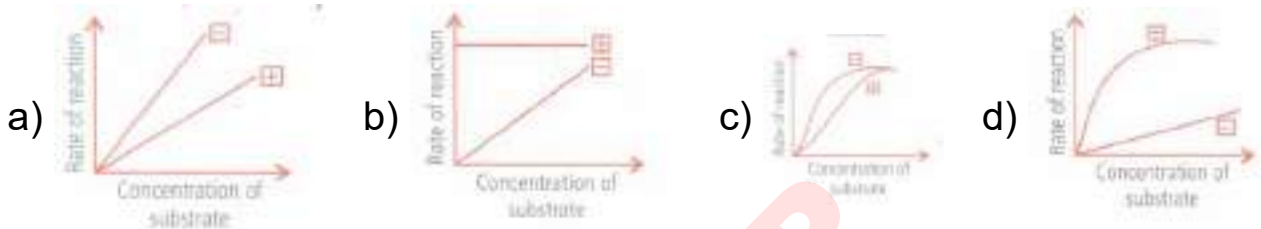
!75. Unit of protein is:-

- a) Amino acid b) Monosaccharide c) NH_3 d) Nucleotide

!76. How many carbon atoms are generally used in composition of monosaccharides?

- a) 3 to 7 b) 1 to 5 c) 5 to 10 d) 5 to 15

!77. Which of the following graphs correctly indicates the reaction in presence (indicated by +) and absence (indicated as -) of an enzyme?



!78. Select the incorrect statement from the following.

a)

Prosthetic groups are inorganic compounds which tightly bind with the apoenzyme

b)

Coenzymes are organic compounds but their association with apoenzyme is only transient

c) Coenzymes serve as co-factors in number of enzyme catalysed reactions

d) All of these

!79. Read the given statements and select the correct option.

(i) Right end of a polysaccharide chain is called reducing end while left end is called non-reducing end.

(ii) Starch can hold iodine molecules in its helical secondary structure but cellulose being non-helical, cannot hold iodine.

(iii) Starch and glycogen are branched molecules.

(iv) Starch and glycogen are the reserve food materials of plants and animals, respectively

a) Statements (i) and (ii) are correct b) Statements (ii) and (iii) are correct

c) Only statement (iv) is correct d) All statements are correct

!80. Which one of the following hydrolyses internal phosphodiester bonds in a polynucleotide chain?

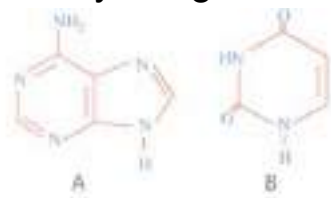
- a) Lipase b) Protease c) Endonuclease d) Exonuclease

!81. The primary structure of a protein molecule has

- a) two ends b) one end c) three ends d) no ends

- !82. Enzymes that catalyse removal of groups from substrates by mechanisms other than hydrolysis, and addition of groups to double bonds, are called
a) ligases b) lyases c) hydrolases d) dehydrogenases.
- !83. A non-proteinaceous enzyme is:
a) Lysozyme b) Ribozyme c) Ligase d) Deoxyribonuclease
- !84. Cholesterol is synthesized in -
a) pancreas b) Brunners gland c) Spleen d) Liver
- !85. Which of the following statements about enzymes are correct?
(i) Enzymes do not alter the overall change in free energy for a reaction.
(ii) Enzymes are proteins whose three dimensional shape is key to their functions.
(iii) Enzymes speed up reactions by lowering activation energy.
(iv) Enzymes are highly specific for reactions.
(v) The energy input needed to start a chemical reaction is called activation energy.
a) (i) and (v) b) (ii) and (iv) c) (i), (ii) and (iv) d) All of these
- !86. Which of the following base pair is wrong?
a) A-T b) G-C c) A-C d) A-U
- !87. Glycogen is a polymer of _____.
a) Galactose b) Glucose c) Fructose d) Sucrose
- !88. Sugar with five membered rings are called-
a) Pyranose b) Furanose c) Dextrorotatory d) Laevortatory
- !89. Distance between two nucleotide pairs of DNA is-
a) 0.34 nm b) 34 \AA c) 3.4μ d) 34 nm
- !90. Study the given statements and select the correct option.
(i) Carbohydrates, proteins, nucleic acids and lipids are primary metabolites.
(ii) Alkaloids, flavonoids, rubber, etc., are secondary metabolites.
(iii) Linoleic, linolenic and palmitic acids are the three essential fatty acids
a) Statements (i) and (ii) are correct b) Statements (i) and (iii) are incorrect
c) Statements (i) and (iii) are correct d) Statements (i) and (iii) are correct
- !91. DNA is composed of repeating units of _____.
a) Ribonucleosides b) Deoxyribonucleosides c) Ribonucleotides
d) Deoxyribonucleotides

92. Identify the given structural formulae and select the correct option.



a)

A	B
Adenine	Uracil

b)

A	B
Guanine	Thymine

c)

A	B
Adenine	Guanine

d)

A	B
Cytosine	Thymine

93. Which of the two groups of the given formula is involved in peptide bond formation between different amino acids?

a) 2 and 3 b) 1 and 3 c) 1 and 4 d) 2 and 4

94. Many elements are found in living organisms either free or in the form of compounds. One of the following is not found in living organisms

a) Silicon b) Magnesium c) Iron d) Sodium

95. Which of the following hormones can play a significant role in osteoporosis?

a) Estrogen and parathyroid hormone b) Progesterone and aldosterone
c) Aldosterone and prolactin d) Parathyroid hormone and prolactin

96. Term protoplasm was introduced by-

a) Purkinje b) Schultze c) Sutton and Boveri d) Von mohl

97. Select the option that correctly identifies the chemical bonds present in the given biomolecules.

Polysaccharides - A, Proteins - B, Fats - C, Water - D

a)

A	B	C	D
Ester	Peptide	Glycosidic	Hydrogen

b)

A	B	C	D
Glycosidic	Peptide	Ester	Hydrogen

c)

A	B	C	D
Glycosidic	Peptide	Hydrogen	Ester

d)

A	B	C	D
Hydrogen	Ester	Peptide	Glycosidic

98. Adenine is _____.

a) Purine b) Pyrimidine c) Nucleoside d) Nucleotide

99. Cytidylic acid is:-

a) Ribose + Cytosine + phosphate b) Ribose + cytosine c) Nucleoside
d) Deoxyribonucleotide

100. Histone is a basic protein due to -

- a) Alanine & glycine b) Methionine & serine c) Tryptophan & tyrosine
d) Lysine & Arginine

101. Lactose is composed of _____.
a) glucose + glucose b) glucose + fructose c) fructose + galactose
d) glucose + galactose
102. Which compound produces more than twice the amount of energy as compared to carbohydrates?
a) Protein b) Fats c) Vitamins d) Glucose
103. If there are 10,000 base pairs in DNA, then its length will be:-
a) 340 nm b) 3400 nm c) 34000 nm d) 340000 nm
104. Biological molecules are primarily joined by
a) peptide bonds b) ionic bonds c) hydrogen bonds d) covalent bonds
105. Nucleic acids are made up of-
a) Amino acids b) Pentose sugars c) Nucleosides d) Nucleotides
106. Which of the following is a reducing sugar?
a) Galactose b) Gluconic acid c) B-methyl galactoside d) Sucrose
107. Read the given paragraph with few blanks.

Prosthetic groups are (i) compounds distinguished from other co-factors in being (ii) bound to the apoenzyme. For example, in peroxidase and (iii) which catalyse the breakdown of hydrogen peroxide to water and (iv), (v) is the prosthetic group.

Select the option that correctly fills blanks in the above paragraph.

a)

(i)	(ii)	(iii)	(iv)	(v)
organic	tightly	catalase	oxygen	haem

b)

(i)	(ii)	(iii)	(iv)	(v)
inorganic	loosely	catalase	hydrogen	haem

c)

(i)	(ii)	(iii)	(iv)	(v)
inorganic	tightly	isomerase	hydrogen	haem

d)

(i)	(ii)	(iii)	(iv)	(v)
organic	loosely	isomerase	oxygen	haem

108. Match column I with column II and select the correct option from the given codes.

	Column I	Column II
A.	GLUT-4	(i) Intercellular ground substance
B.	Antibody	(ii) Enzyme
C.	Collagen	(iii) Hormone
D.	Trypsin	(iv) Fights infectious agents
E.	Insulin	(v) Enables glucose transport in cells

a) A-(i), B-(ii), C-(iii), D-(iv), E-(v) b) A-(v), B-(iv), C-(i), D-(ii), E-(iii)

c) A-(v), B-(iv), C-(iii), D-(ii), E-(i) d) A-(ii), B-(i), C-(iv), D-(v), E-(iii)

109. **Assertion:** Inorganic catalysts work efficiently at high temperature.

Reason: Enzymes get damaged at high temperature

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

110. Amino acids are produced from _____ .

a) Proteins b) Fatty acids c) Essential oils d) α -keto acids

111. In an enzyme, active sites/pockets/crevices are present on

a) 1° structure b) 2° structure c) 3° structure d) all of these

112. Fats in the body are formed when:-

a) Glycogen is formed from glucose

b) Sugar level becomes stable in blood

c) Extra glycogen storage in liver and muscles is stopped d) All of them

113. Bond between phosphate and sugar in a nucleotide is:

a) H-bond b) Covalent bond c) Phosphodiester bond d) Sulphide bond

114. Read the given statements and select the correct option.

Statement 1: Haemoglobin is an example of quaternary structure of proteins.

Statement 2: Haemoglobin molecule is composed of four polypeptide chains-two α -chains and two β -chains.

- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
15. Which of the following is an amino acid derived hormone?
a) Estradiol b) Ecdysone c) Epinephrine d) Estriol
16. Fattiness is due to the excess of:-
a) Connective tissue b) Blood c) Muscular tissue d) Adipose tissue
17. When we homogenise any tissue in an acid the acid soluble pool represents
a) cytoplasm b) cell membrane c) nucleus d) mitochondria
18. The pyrenoids are made up of _____.
a) Proteinaceous centre and starchy sheath
b) Core of protein surrounded by fatty sheath
c) Core of starch surrounded by sheath of protein
d) Core of nucleic acid surrounded by protein sheath
19. Who proposed the name sarcode for protoplasm?
a) Von mohl b) Corti c) Dujardin d) Schultz
20. The formation of protein can be considered as
a) Dehydration synthesis b) Dehydration analysis c) Hydration synthesis
d) Hydration analysis
21. Read the given statements and select the correct option.
Statement 1: Low temperature destroys enzymes by causing their denaturation.
Statement 2: High temperature preserves the enzymes in their inactive stage.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
22. What is the nature of the 2 strands of a DNA duplex?
a) Identical & Complementary b) Antiparallel & complementary
c) Dissimilar & non complementary d) Antiparallel & non complementary
23. Sucrose is composed of-
a) Glucose & Fructose b) Glucose & Glycogen
c) Two molecules of Glucose d) Glycogen & Fructose

24. Which of the following is a heteropolymer?
 a) Cellulose b) Peptidoglycan c) Starch d) Glycogen
25. The catalytic efficiency of two different enzymes can be compared by the _____ .
 a) Formation of the product b) pH optimum value c) K_m value
 d) Molecular size of the enzyme
26. Protein most abundant in human body is:-
 a) Collagen b) Myosin c) Actin d) Albumin
27. Which substance is not a carbohydrate?
 a) Starch b) Glycogen c) Wax d) Glucose
28. Identify the substances having glycosidic bond and peptide bond, respectively in their structure.
 a) Cellulose, lecithin b) Inulin, Insulin c) Chitin, cholesterol
 d) Glycerol, trypsin
29. Nucleic acids are found in
 a) Nucleus b) Cytoplasm c) Both nucleus & Cytoplasm
 d) Nucleus & ribosomes
30. Read the given statement and select the option that correctly identifies X and Y.

In a glycogen molecule, successive glucose units are joined together by X and branches are linked together by Y.

a)

X	Y
1, 4- α -glycosidic bonds	1, 4- α -glycosidic acids

b)

X	Y
1, 4- α -glycosidic bonds	1, 6- α -glycosidic bonds

c)

X	Y
1,6- α -glycosidic acids	1, 4- α -giycosidic acids

d)

X	Y
1, 6- α -glycosidic acids	1, 6- α -giycosidic acids

31. Nucleotide is -

- a) N-base, pentose sugar and phosphoric acid
 b) Nitrogen, Hexose sugar and phosphoric acid
 c) Nitrogen base, pentose sugar
 d) Nitrogen base, trioses and phosphoric acid
132. The inhibitor which does not resemble the substrate in structure and binds to the enzyme at site other than the active site is called
 a) competitive inhibitor b) non-competitive inhibitor c) activator
 d) substrate analogue.
133. An amino acid under certain conditions have both positive and negative charges simultaneously in the same molecule. Such a form of amino acid is called
 a) acidic form b) basic form' c) aromatic form d) zwitterionic form
134. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Galactose	(i) Protein
B. Anticoagulant	(ii) Phospholipid
C. Fructose	(iii) Brain sugar
D. Lecithin	(iv) Heparin
E. Insulin	(v) Fruit sugar

- a) A-(v), B-(iii), C-(ii), D-(i), E-(iv) b) A-(v), B-(iii), C-(i), D- (iv), E-(ii)
 c) A-(i), B-(ii), C-(iii), D-(v), E-(iv) d) A-(iii), B-(iv), C-(v), D-(ii), E-(i)
135. Glycogen is stored in -
 a) Liver and muscles b) Liver only c) Muscles only d) Pancreas
136. **Assertion:** The exoskeleton of arthropods is made up of complex polysaccharide called chitin.

Reason: Plant cell walls are made of cellulose.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

137. Which amino acids is non essential for human body?
a) Glycine b) Phenyl alanine c) Arginine d) Methlonine
138. Units of proteins which unite in long chains to for proteins are called-
a) Sugar b) Purines c) Pyrimidines d) Amino acids
139. Genetic information is carried by the long chain molecules which are made up of -
a) Amino acids b) Nucleotides c) Chromosomes d) Enzymes
140. Adult human haemoglobin consists of
a) 2 subunits (α , α) b) 2 subunits (β , β) c) 4 subunits (2α , 2β)
d) 3 subunits (2α , 1β)
141. Essential component of all living organisms
a) Hemoglobin b) Protein c) Chlorophyll d) Carbohydrate
142. Which of the following type of water is most abundantly found in protoplasm?
a) Free form b) Bound form c) Crystal form d) Ice
143. About 98 percent of the mass of every living organism is composed of just six elements including carbon, hydrogen, nitrogen, oxygen and _____
.
a) Sulphur and magnesium b) Magnesium and sodium
c) Calcium and phosphorus d) Phosphorus and sulphur.
144. In a DNA molecule, the phosphate group is attached to _____ carbon of the sugar residue of its own nucleotide and _____ carbon of the sugar residue of the next nucleotide by _____ bonds.
a) 5', 3', phosphodiester b) 5', 3', glycosidic c) 3', 5', phosphodiester
d) 3', 5', glycosidic

**Ravi Maths Tuition Centre****Time : 1 Mins****CELL CYCLE AND CELL DIVISION 1****Marks : 1057**

1. During cell cycle, two molecules of DNA are present in chromosome during
a) G_1 phase b) Beginning of S phase c) G_2 phase d) End of M-phase
2. What happens in synthesis phase during cell Cycles ;
a) DNA Synthesis b) Chromosome number becomes double
c) Formation of two nuclei d) Synthesis of tubulin proteins
3. Best material to study meiosis is
a) root tip b) ovary c) young anther d) pollen grain
4. Genetic map is one that _____.
a) Shows the distribution of various species in a region.
b) Establishes sites of the genes on a chromosome.
c) Establishes the various stages in gene evolution.
d) Show the stages during the cell division.
5. If you are provided with root-tips of onion in your class and are asked to count the chromosomes, which of the following stages can you most conveniently look into?
a) Metaphase b) Telophase c) Anaphase d) Prophase
6. Which part of plant is suitable for the study of melosis;
a) Root apes b) Ovary c) Anther d) Shoot apex
7. Chromosomal morphology (Structure) is best observed at;
a) Prophase b) Metaphase c) Interphase d) Anaphase
8. At what stage of the cell cycle are histone proteins synthesised in a eukaryotic cell?
a) During G_2 stage of Prophase b) During S-phase
c) During entire prophase d) During telophase
9. Best stage to observe shape, size and number of chromosomes is _____.
a) Interphase b) Metaphase c) Prophase d) Telophase
10. Synthesis of histone proteins occurs in
a) G_1 phase b) interphase c) anaphase d) G_0 phase

11. If the cell is diploid in G_1 than after the S phase cell remain/become;
a) n b) $4n$ c) $8n$ d) $2n$
12. Which of the two events restore the normal number of chromosomes in life cycle?
a) Mitosis and Melosis b) Meiosis and fertilisation c) Fertilisation and mitosis
d) Only melosis
13. Four different steps that occur during meiosis are given in the following list.
(i) Complete separation of chromatids
(ii) Pairing of homologous chromosomes
(iii) Lining up of paired chromosomes on equator
(iv) Crossing over between chromatids
Select the correct sequential arrangement of the steps.
a) (ii), (iii), (iv), (i) b) (iii), (ii), (iv), (i) c) (ii), (iv), (iii), (i) d) (iii), (i), (ii), (iv)
14. During telophase
a) Nuclear membrance is formed b) Nucleols appears
c) Astral rays disappear d) All the above
15. Centrosome undergo duplication during (i) of (ii) and begin to move towards opposite poles of the cell during (iii) stage of (iv).
a)

(i)	(ii)	(iii)	(iv)
s phase	Interphase	Prophase	Mitosis

b)

(i)	(ii)	(iii)	(iv)
s phase	Interphase	Anaphase	Mitosis

c)

(i)	(ii)	(iii)	(iv)
Prophase	Mitosis	Metaphase	Mitosis

d)

(i)	(ii)	(iii)	(iv)
Prophase	Mitosis	Anaphase	Mitosis
16. If a diploid cell is treated with colchicine then it becomes _____.
a) Triploid b) Tetraploid c) Diploid d) Monoploid
17. The correct sequence of prophase - I of melosis is;
a) Leptotene, pachytene, zygotene, diplotene, diakinesis
b) Leptotene, diplotene, pachytene, zygotene, diakinesis
c) Leptotene, zygotene, pachytene, diplotene, diakinesis
d) Leptotene, zygotene, diakinesis, diplotene
18. In which stage the DNA is doubled;
a) Metaphase b) Anaphase c) Interphase d) Prophase
19. Anaphase Promoting Complex (APC) is a protein degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur?
a) Chromosomes will not condense b) Chromosomes will be fragmented
c) Chromosomes will not segregate

d) Recombination of chromosome arms will occur

20. Match the stages of meiosis of column-I to their characteristic features in column-II and select the correct option using the codes given below :

COLUMN 1	COLUMN 2
A. Pachytene	(i) Pairing of homologous chromosomes
B. Metaphase I	(ii) Terminalization of chiasmata
C. Diakinesis	(iii) Crossing-over takes place
D. Zygotene	(iv) Chromosomes align at equatorial plate

a)

A	B	C	D
(iii)	(iv)	(ii)	(i)

b)

A	B	C	D
(i)	(iv)	(ii)	(iii)

c)

A	B	C	D
(ii)	(iv)	(iii)	(i)

d)

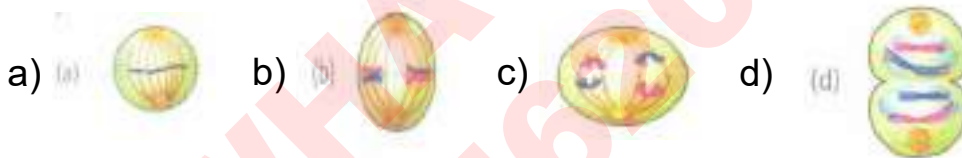
A	B	C	D
(iv)	(iii)	(ii)	(i)

21. How many generations are required by a cell of meristem to produce 128 cells?
a) 127 b) 64 c) 32 d) 7
22. During which phase(s) of cell cycle, amount of DNA in a cell remains at 4C level if the initial amount is denoted as 2C?
a) G_0 and G_1 b) G_1 and S c) Only G_2 d) G_2 and M
23. During karyokinesis, the spindle fibres get attached to condensing chromosome at a highly differentiated region. This region is called as
a) chromomere b) chromocentre c) centriole d) kinetochore.
24. Lampbrush chromosomes are seen in which typical stage?
a) Mitotic anaphase b) Mitotic prophase c) Mitotic metaphase
d) Meiotic prophase
25. Four different steps that occur during meiosis are given in the following list
a) Complete separation of chromatids
b) Pairing of homologous chromosomes
c) Lining up of paired chromosomes on equator
d) Crossing over between chromatids
26. Read the following statements.
(i) In mitotic cell division chromosome number is halved.
(ii) Centromere is the point where two sister chromatids are held together.
(iii) The period between two successive mitotic divisions is known as telophase.
(iv) In G_1 phase of cell cycle protein and RNA are synthesised.
Which of the above given statements are correct?

- a) (i) and (iii) only b) (ii) and (iii) only c) (i) and (iv) only d) (ii) and (iv) only
27. Which of the following statements is not correct regarding colchicine?
 a) It prevents assembly of microtubules. b) It inhibits chromosome replication.
 c) It is an alkaloid. d) It is called as mitotic poison.
28. Select the correct statement about G_1 phase
 a) Cell is metabolically inactive. b) DNA in the cell does not replicate
 c) It is not a phase of synthesis of macromolecules d) Cell stops growing
29. During mitosis, E.R and nucleolus begin to disappear at:
 a) Early metaphase b) Late metaphase c) Early prophase
 d) Late prophase
30. DNA replication is found in;
 a) Mitosis and meiosis - I b) Mitosis and meiosis - I and meiosis -II
 c) meiosis only d) Mitosis only
31. The figure given below shows a cell undergoing meiosis.



Which of the options below shows the next stage in the process?



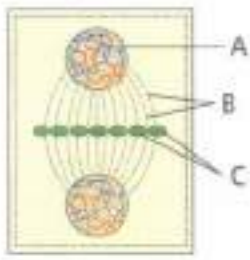
32. Which of the following not occurs in Anaphase - I
 a) Segregation of homologous chromosomes b) Shortening in spindle
 c) Poleward movement of chromosomes d) Division of centromere
33. Read the given statements which represent the features of the figures A, B, C and D. Match them correctly and select the correct option.
 (i) Chromosomes appear like a ball of wool (spindle stage)
 (ii) Reformation of nuclear envelope, nucleolus, Golgi complex and ER
 (iii) Formation of equatorial plate
 (iv) Splitting of centromeres
 a) A-(iv), B-(iii), C-(i), D-(ii) b) A-(iii), B-(iv), C-(i), D-(ii)
 c) A-(ii), B-(iii), C-(i), D-(iv) d) A-(iv), B-(ii), C-(iii), D-(i)
34. The exchange of genetic material between chromatids of paired homologous chromosomes during first meiotic division is called _____ .
 a) Transformation b) Chiasmata c) Crossing over d) Synapsis

35. If a tissue has at a given time 1024 cells, how many cycles of mitosis had the original parental single cell undergone?
a) 512 b) 10 c) 1024 d) 256
36. Select the correct match.
a) Quiescent phase - G_2 phase b) Synthesis phase - G_1 phase
c) Centromere splitting - Anaphase
d) Chromosomal condensation - Telophase
37. Identify the wrong statement about meiosis.
a) Pairing of homologous chromosomes b) Four haploid cells are formed
c) At the end of meiosis number of chromosomes are reduced to half
d) Two cycles of DNA replication occur.
38. Meiosis has evolutionary significance because it results in _____.
a) Genetically similar daughters b) Four daughter cells c) Eggs and sperms
d) Recombinations
39. **Assertion:** Crossing over leads to recombination of genetic material on the two chromosomes.
Reason: Crossing over is the exchange of genetic material between two homologous chromosomes.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false
d) If both assertion and reason are false
40. **Assertion:** Interphase occupies 75-95% of the total generation time.
Reason: Interphase (i-phase) is the long non-dividing phase.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false
d) If both assertion and reason are false.

41. In the meiotic cell division, 56 daughter cells are produced by two successive divisions in which
- a) First division is equational, second is reductional
 - b) First division is reductional, and second is equational
 - c) Both divisions are reductional
 - d) Both divisions are equational
42. **Assertion:** The process of pairing of the chromosomes is called synapsis.
Reason: Synapsis occurs during leptotene stage.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
 - b)
If both assertion and reason are true but reason is not the correct explanation of assertion
 - c) If assertion is true but reason is false
 - d) If assertion is true but reason is false
43. Pre - DNA Synthesis Phase is;
- a) G₁-phase
 - b) G₂-phase
 - c) S- Phase
 - d) Prophase
44. Arrange the given statements in the correct sequence of their occurrence during prophase I.
- (i) Thin thread like chromosomes with a beaded appearance
 - (ii) Appearance of recombination nodules
 - (iii) Formation of bivalents/tetrads
 - (iv) Terminalisation of chiasmata
 - (v) Appearance of chiasmata
- a) (i) → (iii) → (ii) → (v) → (iv)
 - b) (i) → (ii) → (iii) → (iv) → (v)
 - c) (i) → (iv) → (v) → (ii) → (iii)
 - d) (i) → (iii) → (ii) → (iv) → (v)
45. In meiosis crossing over is initiated at:
- a) Diplotene
 - b) Pachytene
 - c) Leptotene
 - d) Zygotene
46. Which of the events listed below is not observed during mitosis?
- a) Chromatin condensation
 - b) Movement of centrioles to opposite poles
 - c)
Appearance of chromosomes with two chromatids joined together at the centromere
 - d) Crossing over
47. Which of the following shows the correct sequence of the given mitotic stages?
- a) D → C → B → A
 - b) C → B → D → A
 - c) B → A → C → D
 - d) C → B → A → D

48. Complex formed by a pair of synapsed homologous chromosomes is known as:
a) Kinetochore b) Axoneme c) Equatorial plate d) Bivalent
49. **Assertion:** Cell growth results in disturbing the ratio between the nucleus and cytoplasm.
Reason: Mitosis helps the cell to restore the nuclei generation cytoplasmic ratio.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false
d) If both assertion and reason are false
50. The plant cell, cytokinesis occurs by
a) Cell plate b) Invagination c) Cleavage d) Furrowing
51. Disjunction refers to
a) the separation of homologous chromosomes at anaphase I
b)
the type of chromosomal aberration in which there is loss of a part of a chromosome
c) incompatibility in fungi and other thallophytes
d) modification of gene action by a nonallelic gene.
52. The point, at which polytene chromosomes appear to be attached together, is called _____.
a) Centriole b) Centromere c) Chromomere d) Chromocentre
53. Identify the stage when homologous chromosomes separate but sister chromatids remain associated.
a) Metaphase I b) Anaphase I c) Metaphase II d) Anaphase II
54. What is true about telophase stage of mitosis?
a) Chromosomes lose their identity as discrete elements
b) Chromosomes cluster at opposite spindle poles
c) Nuclear envelope, nucleolus, Golgi complex and ER reform. d) All of these

55. The given diagram depicts cell plate method of cytokinesis in plant cells. Identify A, B and C.



a)

A	B	C
Daughter nucleus	Phargmoplast	Vesicles

b)

A	B	C
Daughter nucleus	Vesicles	Phargmoplast

c)

A	B	C
Parent nucleus	Vesicles	Phargmoplast

d)

A	B	C
Parent nucleus	Phargmoplast	Vesicles

56. At which of the following stages, the chromosomes appear single, thin and thread like?

a) Leptotene b) Zygotene c) Pachytene d) Diplotene

57. At anaphase - II of melosis each chromosome contains ;

a) 4 DNA b) 3 - DNA c) 2 - DNA d) 1 - DNA

58. **Assertion:** Prophase is the first stage of mitosis which follows S and G₁ phases of interphase.

Reason: Prophase is marked by the initiation of clusters of chromosomes.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

59. **Assertion:** The final stage of meiotic prophase I is diplotene.

Reason: Diplotene is marked by terminalisation of chiasmata.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

60. Which one of the following structures will not be common to mitotic cells of higher plants?

a) Cell plate b) Centriole c) Centromere d) Spindle fibres

61. Human cells in culture show a cell cycle to be completed in approximately

a) 42 hours b) 24 hours c) 24 minutes d) 24 seconds.

62. Select the incorrect match regarding mitotic cell division.

(i) Prophase	Chromosomes begin to uncoil
(ii) Metaphase	Chromatids move apart
(iii) Telophase	The nuclear membrane reappears
(iv) Late	Each chromosome consists of two anaphase chromatids
(v) Interphase	Chromosomes are not distinct

a) (ii) and (iv) only b) (i) and (iii) only c) (ii), (iv) and (v) only

d) (i) and (v) only

63. In meiosis, nuclear membrane and nucleolus disappear during ;

a) Zygotene b) Pachytene c) Diakinesis d) Metaphase - I

64. DNA replication in bacteria occurs:

a) During S-phase b) Within nucleolus c) Prior to fission

d) Just before transcription.

65. Spindle fibres attach on to;

a) Telomere of the chromosome b) Kinetochore of the chromosome

c) Centromere of the chromosome d) Kinetosome of the chromosome

66. Colchicine is a cell poison which arrests cell division at _____ and can induce_____.

a) metaphase, parthenocarpy b) anaphase, parthenocarpy

c) metaphase, polyploidy d) anaphase, polyploidy

67. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Disintegration of nuclear membrane	(i) Anaphase

Column I	Column II
B. Appearance of nucleolus	(ii) Prophase
C. Division of centromere	(iii) Telophase
D. Replication of DNA	(iv) S-phase

- a) A-(ii), B-(iii), C-(i), D-(iv) b) A-(ii), B-(iii), C-(iv), D-(i)
 c) A-(iii), B-(ii), C-(i), D-(iv) d) A-(iii), B-(ii), C-(iv), D-(i)

68. Which one of the following precedes re-formation of the nuclear envelope during M phase of the cell cycle?

- a) Decondensation from chromosomes, and reassembly of the nuclear lamina.
 b) Transcription from chromosomes, and reassembly of the nuclear lamina.
 c) Formation of the contractile ring, and formation of the phragmoplast.
 d) Formation of the contractile ring, and transcription from chromosomes.

69. A cell's division time is 1 minute. In 20 minutes, a culture tube (culture medium) is 118^{th} filled with cells. When the tube will be fully filled?

- a) 21 minutes b) 23 minutes c) 60 minutes d) 160 minutes

70. To produce 102 pollen grains, how many meiotic divisions are required?

- a) 25 b) 25.5 c) 26 d) 27

71. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Chromosomes move to equator	(i) Pachytene
B. Centromere splits and chromatids move apart	(ii) Zygotene
C. Pairing between homologous	(iii) Anaphase chromosomes
D. Crossing over between homologous chromosomes	(iv) Metaphase

- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(ii), B-(iii), C-(iv), D-(i)
 c) A-(iv), B-(iii), C-(ii), D-(i) d) A-(iii), B-(i), C-(iv), D-(ii)

72. The Golgi complex participates in _____.

- a) Respiration in bacteria b) Formation of secretory vesicles
 c) Fatty acid breakdown d) Activation of amino acid

73. M-phase of cell cycle consist of;

- a) G_1 , S and G_2 , phase b) Prophase, Metaphase, Anaphase, Telophase
 c) Interphase, Prophase, Metaphase, Anaphase, Telophase d) Only Prophase

74. Balbiani rings (puffs) are sites of _____.

- a) DNA replication b) RNA and protein synthesis
 c) Synthesis of polysaccharides d) Synthesis of lipids

75. **Assertion:** Some cells enter G_0 phase leading to inactivation of cell cycle.
Reason: G_0 phase occurs due to non-availability of mitogen and energy rich compounds
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false.
76. At which stage of mitosis, the two daughter chromatids separate from each other, migrate towards the opposite poles and are now referred to as chromosomes of the future daughter nuclei?
- a) Prophase b) Metaphase c) Anaphase d) Telophase
77. Select the incorrect statement regarding S phase of interphase.
- a) It occurs between G_1 and G_2 .
- b) DNA replicates in the nucleus in this phase.
- c) Centrioles duplicate in the cytoplasm.
- d) As DNA is doubled, number of chromosomes also doubles
78. Which of the following is key event of anaphase of mitotic division?
- a)
Chromosomes are moved to spindle equator and get aligned through spindle fibres to both poles.
- b) Centromeres split and chromatids separate.
- c)
Chromosomes cluster at opposite spindle poles and their identity is lost as discrete elements
- d) Both (b) and (c)
79. **Assertion:** Metaphase II begins with splitting of centromere of each chromosome into two.
Reason: In Anaphase II chromosomes align at the equator.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

80. Meiosis does not occur in

a) bacteria b) cyanobacteria c) plant cell d) both (a) and (b)

81. Terminalization is related to

a) Diakinesis b) Zygotene c) Leptotene d) Pachytene

82. Thick - thread stage occurred in;

a) Leptotene b) Zygotene c) Pachytene d) Diplotene

83. This phase of cell cycle is a period of intense synthesis and growth. It constitutes 95% of the duration of cell cycle. It is

a) interphase b) telophase c) prophase d) anaphase.

84. Synaptonemal complex is characteristic of ;

a) Mitotic chromosomes b) Leptotene chromosome
c) Paired Meiotic chromosomes d) Metaphase

85. Reappearance of nuclear membrane & nucleolus along with thinning & elongation in chromosomes are diagnostic characters for the phase;

a) Anaphase b) Metaphase c) Interphase d) Telophase

86. You are provided with floral buds of Chrysanthemum in your class and are asked to count the chromosomes, then which of the following stages would you prefer to look into?

a) Prophase b) Metaphase c) Anaphase d) Interphase

87. In which of the following stages, a chromosome is minimum coiled?

a) Interphase b) Metaphase c) Prophase d) Anaphase

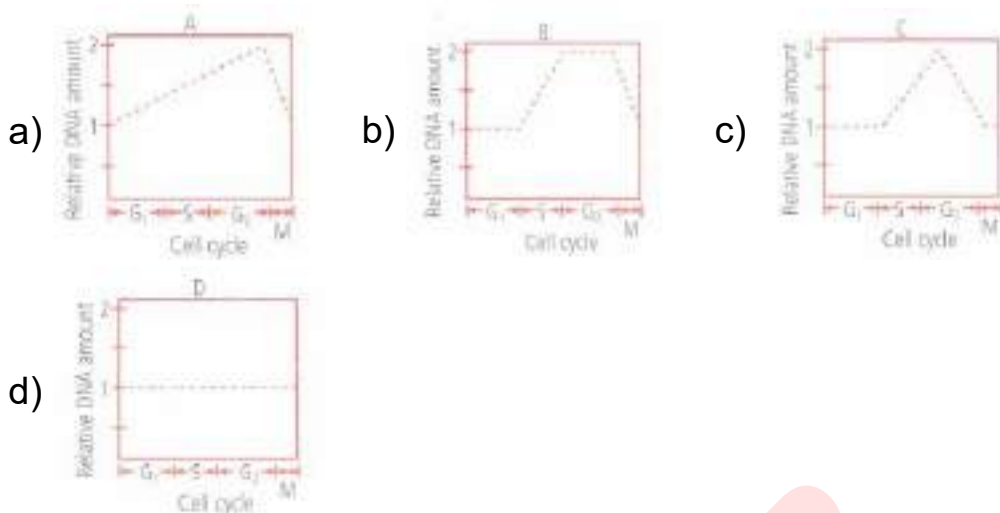
88. At what phase of meiosis there are two cells, each with separated sister chromatids that have been moved to opposite spindle poles?

a) Anaphase II b) Anaphase I c) Telophase II d) Telophase I

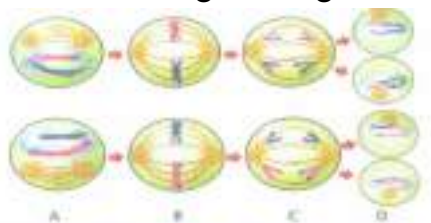
89. Zygotene of prophase-I is characterised by

a) chromomeres b) synaptonemal complex c) crossing over
d) terminalisation of chiasmata

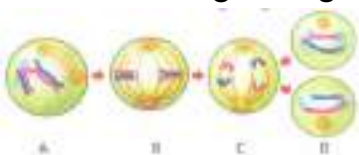
90. Which of the following graphs shows the relative change in the amount of mitochondrial DNA of a cell undergoing mitosis?



91. Refer to the given figure and select the correct statement.



- a) In stage B homologous chromosomes are interconnected and chromosomes occur in pairs.
- b) Stage A is divisible into five substages.
- c) In stage D, chromosomes are not enclosed by a nuclear envelope.
- d) In stage C centromeres divide and chromosomes are single stranded.
92. After meiosis - I the two chromatids of a chromosome are ;
- a) Genetically similar b) Genetically different
- c) There occurs only one chromatid in each chromosome d) None of the above
93. Number of chromosome in primary oocyte is:
- a) Same as that of secondary oocyte b) Half as that secondary oocyte
- c) Double as that of secondary oocyte d) Same as that of ovum
94. Crossing over takes place in ;
- a) Diplotene b) Diakinesis c) Zygotene d) pachytene
95. Refer to the given stages A, B, C and D of meiosis I and select the incorrect statement regarding them.



a)

The last stage of A is diakinesis which is marked by terminalisation of chiasmata.

b)

In stage B, microtubules from the opposite poles of the spindle attach to the pair of homologous chromosomes.

c)

In stage C, homologous chromosomes separate, while sister chromatids remain associated at their centromeres.

d)

In stage D, nuclear membrane and nucleolus disappear, cytokinesis follows and this is called as dyad of cells.

96. In meiosis;

a) Division of nucleus twice but replication of DNA only once

b) Division of nucleus twice and replication of DNA twice

c) Division of nucleus once and replication of DNA is also once

d) Division of nucleus once and DNA - replication is twice

97. Which stage DNA replication takes place?

a) Metaphase b) G₁-phase c) S-phase d) G₂-phase

98. At which stage of meiosis does the genetic constitution of gametes is finally decided?

a) Metaphase I b) Anaphase II c) Metaphase II d) Anaphase I

99. Synaptonemal complex first appear;

a) Leptotene b) Pachytene c) Zygotene d) Diplotene

100. In meiosis, division of centromere occurs during ;

a) Interphase b) Anaphase - I c) Anaphase - II d) Metaphase - I

101. While in mitosis, the daughter cells resemble each other and also the parent cell; in meiosis they differ not only from parent cell in having half the number of chromosomes, but also differ among themselves qualitatively in genetic constitution due to

a) segregation and crossing over only

b) independent assortment and segregation only


c) independent assortment and crossing over only

d) crossing over, independent assortment and segregation

102. Separation of homologous chromosomes during Anaphase - I is called ;

a) Synapsis b) Disjunction c) Nondisjunction d) Crossing Over

103. Meiosis consists of

- a) two cell divisions with only two rounds of chromosome replication
 b) a single cell division with chromosome replication
 c) two cell divisions without any DNA replication
 d) two cell divisions in which chromosome number is reduced to half
104. Which of the following options give the correct sequence of events during mitosis?
- a)
 condensation > nuclear membrane disassembly > crossing over > segregation > telophase
- b)
 condensation > nuclear membrane disassembly > arrangement at equator > centromere division > segregation > telophase
- c)
 condensation > crossing over > nuclear membrane disassembly > segregation > telophase
- d)
 condensation > arrangement at equator > centromere division > segregation > telophase
105. Identify the structures indicated by labels (i), (ii), (iii) and (iv) and select the correct option.
- 
- (i)-Chromatid, (i)-Chromosome, (i)-Chromatid,
 (ii)-Centriole, (ii)-Centricle, (ii)-Centromere,
 (iii)-Centromere, (iii)-Centromere, (iii)-Centriole,
 a) (iv)-Chromosome b) (iv)-Chromatid c) (iv)-Chromosome
 (i)-Chromosome,
 (ii)-Centromere,
 (iii)-Centriole,
 d) (iv)-Chromatid
106. Which of the following is longest phase of the cell cycle?
 a) prophase b) Interphase c) Telophase d) M - Phase
107. In which stage of cell division, number of chromosome best counted ;
 a) Prophase b) Metaphase c) Telophase d) Interphase
108. A bivalent consists of _____ .

- a) Two chromatids and one centromere
 - b) Two chromatids and two centromeres
 - c) Four chromatids and two centromeres
 - d) Four chromatids and four centromeres
109. Best material for studying mitosis in laboratory is
a) leaf tip b) shoot tip c) root tip d) gamete.
110. Which of the following not occurs in Anaphase -I but occurs in Anaphase - II
a) condensation of chromosomes b) poleward movement of chromosome
c) contraction of spindle fibers d) splitting of centromere
111. Synapsis occurs between:
a) Spindle fibres and centromeres b) mRNA and ribosomes
c) A male and female gamete d) Two homologous chromosomes
112. Cytokinesis in an animal cell takes place by _____ method in _____ direction; while in a plant cell it occurs by _____ method in _____ direction.
a) furrowing, centrifugal, cell plate, centripetal
b) furrowing, centripetal, cell plate, centrifugal
c) cell plate, centrifugal, furrowing, centripetal
d) cell plate, centripetal, furrowing, centrifugal
113. The DNA content of individual cells and the number of cells in each phase of a "cell cycle" can be determined using flow cytometry. Which of the following combinations of "phase of a cell cycle and its corresponding DNA content" can be considered normal?
(i) Diploid cells found in the G_0 or G_1 phase.
(ii) Cells with twice the normal DNA content in the early M phase.
(iii) Cells with intermediate amounts of DNA in the S phase.
(iv) Cells with twice the normal DNA content in the G_2 phase.
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)
114. The stage during which separation of the paired homologous chromosomes begins is:
a) Diakinesis b) Diplotene c) Pachytene d) Zygotene.
115. Which one of the following statements is correct?
a) Cell divided by cytokinesis only in mitosis
b) DNA is replaced before the start of meiosis only
c) Spindles consisting of microtubules are formed only in mitosis
d) Exchange of genetic materials occurs only in meiosis
116. Mitosis is characterised by

- a) reduction division b) equal division c) both reduction and equal division
d) pairing of homologous chromosomes

117. In animals meiotic division occurs during formation. This gametic meiosis results in

- a) haplontic life cycle b) diplontic life cycle c) diplohaplontic life cycle
d) none of these

118. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. V-shaped at anaphase	(i) Acrocentric chromosome
B. L-shaped at anaphase	(ii) Metacentric chromosome
C. J-shaped at anaphase	(iii) Telocentric chromosome
D. I-shaped at anaphase	(iv) Sub-metacentric chromosome

- a) A-(iv), B-(ii), C-(i), D-(iii) b) A-(ii), B-(iv), C-(i), D-(iii)
c) A-(ii), B-(iv), C-(iii), D-(i) d) A-(iv), B-(iii), C-(ii), D-(i)

119. Condensation of chromosomes and appearance of astral rays occur during;

- a) Prophase b) Metaphase c) Anaphase d) Telophase

120. If $2n = 4$, then identify the figures A, B and C. as per the following codes and select the correct option.



Anaphase of meiosis I = (i)

Anaphase of mitosis = (ii)

Anaphase meiosis II = (iii)

- a) A-(ij), B-(i), C-(iii) b) A-(iii), B-(ii), C-(i) c) A-(i), B-(ij), C-(iii)
d) A-(ijj), B-(i), C-(ii)

121. The significance of Meiosis is that it -

- a) $2n \xrightarrow{\text{Mitosis}} n \xrightarrow{\text{Fertilization}} 2n \xrightarrow{\text{Meiosis}} 2n$ b) $2n \xrightarrow{\text{Meiosis}} 2n \xrightarrow{\text{Fertilization}} 2n \xrightarrow{\text{Mitosis}} n$
c) $2n \xrightarrow{\text{Meiosis}} n \xrightarrow{\text{Fertilization}} 2n \xrightarrow{\text{Mitosis}} 2n$ d) $2n \xrightarrow{\text{Fertilization}} (n) \xrightarrow{\text{Meiosis}} 2n \xrightarrow{\text{Meiosis}} n$

122. An anther has 1200 pollen grains. How many PMCs must have been there to produce them?

- a) 1200 b) 300 c) 150 d) 2400

123. A bivalent of meiosis I consists of

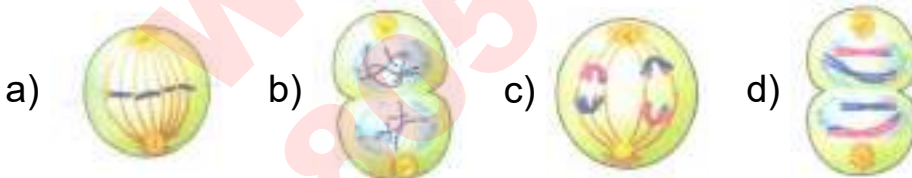
- a) two chromatids and one centromere
b) two chromatids and two centromeres

- c) four chromatids and two centromeres
d) four chromatids and four centromeres
124. The cell cycle of a somatic cell usually consists of all the following, except
a)
The first part of interphase is called G_1 phase. During this, there is maximum increase in cell size and there is active synthesis of RNA and proteins
b)
In synthesis phase the DNA molecule of each chromosome replicates by synthesis of a new DNA molecule
c)
During G_2 phase a cell contains double the amount of DNA ($4C$) present in the original diploid cell ($2n$)
d) The cell cycle consists of a short interphase and long M-phase
125. Which of the following is not the feature of meiosis?
a)
Meiosis involves two sequential cycles of nuclear and cell division, meiosis I and meiosis II but only a single cycle of DNA replication.
b)
Meiosis I is initiated after the parental chromosomes have replicated to produce identical sister chromatids at the S-phase.
c)
Meiosis involves pairing of non-homologous chromosomes and recombination between them.
d) Four haploid cells are formed at the end of meiosis II.
126. The concept of "Omnis cellula-e cellula" regarding cell division was first proposed by _____.
a) Theodore Schwann b) Schleiden c) Aristotle d) Rudolf Virchow
127. Mitotic anaphase differs from metaphase in possessing _____.
a) Same number of chromosomes and same number of chromatids
b) Half number of chromosomes and half number of chromatids
c) Half number of chromosomes and same number of chromatids
d) Same number of chromosomes and half number of chromatids
128. Select the incorrectly matched pair
a) Phragmoplast - Persistent spindle b) Reductional division - Meiosis I
c) Equational division - Meiosis II
d) Crossing over - Non-homologous chromosomes
129. Best material for the study of mitosis in laboratory is _____.

- a) Anther b) Root tip c) Leaf tip d) Ovary
130. In which phase of cell cycle the amount of DNA in a diploid cell become four times as compared to a haploid cell?
a) G_1 b) S c) G_2 , S & M d) G_0
131. Spindle usually persists in the form of _____ during _____ method of cytokinesis.
a) phragmoplast, cleavage b) phragmoplast, cell plate c) cell plate, cell plate
d) cell plate, cell plate
132. Which of the following is called heterotypic division;
a) Meiosis - I b) Meiosis - II c) Mitosis d) Amitosis
133. A cell cycle includes
a) interphase and M phase
b) prophase, metaphase, anaphase and telophase c) G_1 , S and G_2 phases
d) karyokinesis and cytokinesis.
134. During cell cycle in which phase normal components of cell synthesized , and assembled?
a) S b) G_2 c) G_1 d) M
135. Refer to the given figure of cell division.



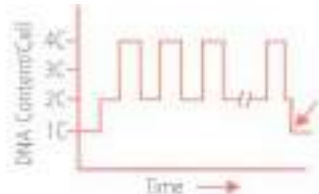
Which of the following options show previous stage of this process?



136. Cells in G_0 phase:
a) Enter the cell cycle b) Suspend the cell cycle c) Terminate the cell cycle
d) Exit the cell cycle
137. Which of the following is not a characteristic feature during mitosis in somatic cells?
a) Synapsis b) Spindle fibres c) Disappearance of nucleolus
d) Centromere of the chromosome
138. Number of chromatids at metaphase is _____.
a) Two each in mitosis and meiosis b) Two in mitosis and one in meiosis
c) Two in mitosis and four in meiosis d) One in mitosis and two in meiosis
139. Diakinesis represents ;

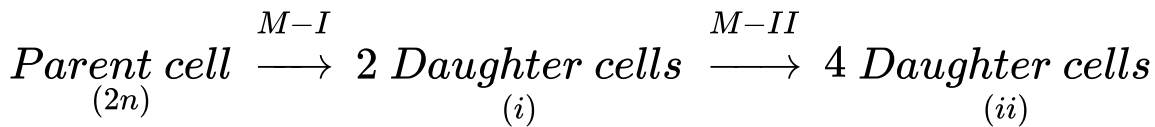
- a) transition to prophase b) transition to metaphase
c) transition to anaphase d) transition to telophase
140. Gap between division phase and start of DNA - replication is called
a) G1 - phase b) G2 - phase c) M - Phase d) Interkinesis
141. If gametes are produced after reduction division, they are termed a
a) coenogametes b) mitogametes c) pseudogametes d) meiogametes.
142. Yeast cell divides once in approximately every
a) 90 minutes b) 9 minutes c) 24 hours d) 24 days
143. Which phase occupies the maximum part of cell cycle?
a) Mitotic phase b) Meiotic phase c) Interphase d) Cytokinesis
144. Crossing over in diploid organisms is responsible for
a) dominance of genes b) linkage between genes c) segregation of alleles
d) recombination of alleles.
145. Meiosis-I is reductional division. Meiosis-II is equational division due to
_____.
a) Pairing of homologous chromosomes b) Crossing over
c) Separation of chromatids d) Disjunction of homologous chromosomes
146. During gamete formation, the enzyme recombinase participates during
_____.
a) Metaphase - I b) Anaphase - II c) Prophase - I d) Prophase - II
147. Chromosome exhibit high level of coiling at which phase of karyokinesis;
a) Prophase b) Metaphase c) Telophase d) Interphase
148. Which of the following is true for nucleolus?
a) It takes part in spindle formation. b) It is a membrane-bound structure.
c) Larger nucleoli are present in dividing cells.
d) It is a site for active ribosomal RNA synthesis.
149. In S-phase of cell cycle:
a) Amount of DNA remains same in each cell
b) Chromosome number is increased
c) Amount of DNA is reduced to half in each cell
d) Amount of DNA doubles in each cell
150. Identify the correct statement with regard to G1 phase (Gap I) of interphase
_____.
a) Cell is metabolically active, grows but does not replicate its DNA
b) Nuclear division takes place c) DNA synthesis or replication takes place
d) Reorganisation of all cell components takes place

151. The enzyme recombinase is required at which stage?
a) Pachytene b) Zygotene c) Diplotene d) Diakinesis
152. If the $n = 16$ in plant cell then what is possible in metaphase -I of meiosis?
a) 32 Bivalents b) 16 Telravalents c) 16 Bivalents d) 32 Bivalents
153. What is the role of NAD^+ in cellular respiration?
a) It is a nucleotide source of ATP synthesis.
b) It functions as an electron carrier. c) It functions as an enzyme.
d) It is the final electron acceptor for anaerobic respiration.
154. **Assertion:** Karyokinesis follows cytokinesis.
Reason: Karyokinesis is the division of cytoplasm into two daughter cells.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false
d) If both assertion and reason are false
155. To build up food reserves in the cytoplasm, chromosomes become unfolded to start transcription of mRNA and rRNA, during which phase of meiosis I?
a) Diakinesis b) Zygotene c) Diplotene d) Leptotene
156. The separation of two chromatids of each chromosome at early anaphase is initiated by
a) the interaction of centromere with the chromosomal fibres
b) the elongation of metaphasic spindle
c) the force of repulsion between the divided kinetochores d) all of these.
157. Given diagram shows variations in the amount of DNA of a developing eukaryote. What the arrow denotes?



- a) First meiotic anaphase b) Second meiotic anaphase c) Mitotic telophase
d) Mitotic telophase
158. Microtubules are absent in
a) mitochondria b) flagella c) spindle fibres d) centriole

159. What does (i) and (ii) represent in the given flowchart?



(i) = 2n (i) = n (i) = n (i) = 2n

a) (ii) = n b) (ii) = n c) (ii) = 2n d) (ii) = 2n

160. **Assertion:** The stage between the two meiotic divisions is called interkinesis.

Reason: Interkinesis is generally short lived.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

161. At which stage, the homologous chromosomes separate due to repulsion, but are yet held by chiasmata?

a) Zygotene b) Pachytene c) Diplotene d) Diakinesis

162. In meiosis, the daughter cells differ from parent cell as well as amongst themselves due to _____.

a) Segregation, independent assortment and crossing over

b) Segregation and crossing over

c) Independent assortment and crossing over

d) Segregation and independent assortment

163. Which phase of mitosis is essentially the reverse of prophase in terms of nuclear changes?

a) S-phase b) Anaphase c) Telophase d) Interphase

164. _____ is the best stage to count the number and study the morphology of chromosomes.

a) Prophase b) Metaphase c) Anaphase d) Telophase

165. When synapsis is completed all along the chromosome, the cell is said to have entered a stage called

a) Zygotene b) Pachytene c) Diplotene d) Diakinesis

166. During meiosis I in humans, one of the daughter cells receives

a) only maternal chromosomes

b) a mixture of maternal and paternal chromosomes

c) same number of chromosomes as present in parent cell d) none of these.

167. Which of the following is wrong about G_1 phase?
a) G_1 Stage followed by Mitosis b) Cell is metabolically active
c) Cells grows continuously d) Cell does not replicated its DNA
168. Chiasmata appears during;
a) Diakinesis b) Synaptotene c) Diplotene d) Leptotene
169. Spindle fibres attach on to:
a) Kinetosome of the chromosome b) Telomere of the chromosome
c) Kinetochore of the chromosome d) Centromere of the chromosome.
170. Chromosomal movement in Anaphase occurs with the help of;
a) Astral rays b) Centrioles c) NOR d) Spindle fibres
171. Which does not occurs in prophase?
a) Decondensation of chromatin b) Condensation of chromatin
c) Appearance of chromosome
d) Disapperance of nuclear membrance and nucleolus
172. During cell division in apical mieristem the nuclear membrane appears in _____ .
a) Metaphase b) Anaphase c) Telophase d) Cytokinesis
173. Identify the given stages of mitosis and select the correct option.
- a)
- | | | | |
|----------|-----------|-----------|----------|
| A | B | C | D |
| Prophase | Metaphase | Telophase | Anaphase |
- b)
- | | | | |
|-----------|----------|----------|-----------|
| A | B | C | D |
| Metaphase | Anaphase | Prophase | Telophase |
- c)
- | | | | |
|----------|-----------|----------|-----------|
| A | B | C | D |
| Anaphase | Metaphase | Prophase | Telophase |
- d)
- | | | | |
|----------|-----------|----------|-----------|
| A | B | C | D |
| Prophase | Metaphase | Anaphase | Telophase |
174. Minimum number of meiotic divisions required to produce 100 wheat grains are
a) 400 b) 125 c) 200 d) 25
175. In the somatic cell cycle _____ .

- a)
In G_1 phase DNA content is double the amount of DNA present in the original cell.
- b) DNA replication takes place in S-phase.
- c) A short interphase is followed by a long mitotic phase.
- d) G_2 phase follows mitotic phase.
176. During anaphasic movements of chromosomes, _____ of each chromosome is/are towards the pole and _____ of the chromosome trail(s) behind.
a) centromere, arms b) arms, centromere c) chromatids, centromere
d) none of these
177. In which stage of mitosis, the chromosomes are composed of two chromatids?
a) Prophase & metaphase b) Anaphase and telophase
c) Prophase and telophase d) Metaphase and anaphase
178. Meiosis in diploid organisms results in
a) production of gametes b) reduction in the number of chromosomes
c) introduction of variation d) all of the above
179. Which among the following is not a prokaryote?
a) Nostoc b) Mycobacterium c) Saccharomyces d) Oscillatoria
180. **Assertion:** Variations are important for the process of evolution.
Reason: Meiosis increases the genetic variability in the population of organisms from one generation to the next.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false
181. The process of crossing over is assisted by which of the following enzymes?
a) Endonuclease b) Polymerase c) Ligase d) Both (a) and (c)
182. A cell at telophase stage is observed by a student in a plant brought from the field. He tells his teacher that this cell is not like other at telophase stage there is no formation of cell plate and thus the cell is containing more number of chromosomes as compared to other dividing cells. This would result in;
a) Somaclonal variation b) Polyteny c) Aneuploidy d) Polyploidy
183. Nuclear envelope disappears at

a) Late metaphase b) Anaphase c) Early prophase d) Late prophase

184. During anaphase I of meiosis:

- a) homologous chromosomes separate
- b) non-homologous chromosomes separate
- c) sister chromatids chromosomes separate
- d) non-sister chromatids chromosomes separate

185. Linkage is a tendency of alleles of different genes to assort together in;

- a) Melosis b) Mitosis c) X - Y Linkage d) Inversion

186. During cell growth, DNA synthesis takes place in _____ .

- a) S-phase b) G₁phase c) G₂-phase d) M-Phase

187. In Anaphase - I each chromosome composed of

- a) One chromatid b) Two chromatid c) Four chromatid d) Many chromatid

188. The durations of mitotic stages in two situations, (A and B) are tabulated below

Phase	Duration of Mitotic Stages(in minutes)	
	A	B
Interphase	1356(22.6 h)	870 (14.5 h)
Prophase	126	54
Metaphase	24	14
Anaphase	5	3
Telophase	22	11
Total	1533(25.6 h)	952(15.9 h)

Following are some interpretations:

I. 'A' and 'B' indicate the same plant tissue grown at higher and lower temperatures respectively.

II. 'A' indicates a slow growing plant species and 'B' indicates a fast growing plant species.

III. Both 'A' and 'B' indicate dormant plant tissues with excessively long interphase.

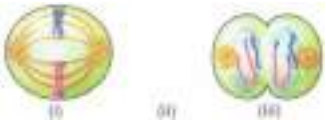




The correct interpretations is/are

- a) I and III b) II and III c) III only d) II only

189. At which of the given stages of mitosis, chromosomes appear in V, L, J and I shapes.

- a) A b) B c) C d) D

190. Diplotene stage of prophase-I is characterised by

- a) dissolution of synaptonemal complex
b)
separation of synapsed homologous chromosomes except at the site of crossovers
c) formation of X-shaped structures called chiasmata d) all of these.
191. Some dividing cells exit the cell cycle and enter vegetative inactive stage. This is called quiescent stage (G₀). This process occurs at the end of:
a) S phase b) G₂ phase c) M phase d) G₁ phase
192. 
In above sequence of figures showing different stages of cell division, the missing stage (ii) is:
a)  b)  c)  d) 
193. During cell division, spindle fibers attach to which part of chromosome ;
a) Primary constriction b) Sec, constriction c) Chromomere d) Chromatid
194. "Bouquet - stage" occur in which sub stages of prophase - I?
a) Leptotene b) Zygotene c) Pachytene d) Diplotene
195. Each chromosome composed of one chromatid in;
a) Anaphase - I b) Anaphase - II c) Metaphase - I d) Metaphase - II
196. Amitosis usually occurs in
a) eukaryotic cells b) prokaryotic cells c) meristems d) spore mother cells.
197. Which one is the correct sequence of a cell cycle?
a) $G_2 \rightarrow M \rightarrow G_1 \rightarrow S$ b) $S \rightarrow G_2 \rightarrow M \rightarrow G_1$ c) $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$
d) $M \rightarrow G_1 \rightarrow S \rightarrow G_2$
198. After karyogamy followed by meiosis, spores are produced exogenously in _____ .
a) Agaricus b) Alternaria c) Neurospora d) Saccharomyces
199. Chromosome duplication without nuclear division refers to
a) meiosis b) mitosis c) androgenesis d) endomitosis.
200. The correct sequence of phases of cell cycle is _____ .
a) $G_1 \rightarrow G_2 \rightarrow S \rightarrow M$ b) $S \rightarrow G_1 \rightarrow G_2 \rightarrow M$
c) $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$ d) $M \rightarrow G_1 \rightarrow G_2 \rightarrow S$

201. _____ is characterised by all the chromosomes coming to lie at the equator, with one chromatid connected by its kinetochore to spindle fibres from one pole and its sister chromatid connected by its kinetochore to spindle fibres from the opposite pole.
a) Prophase b) Metaphase c) Anaphase d) Telophase
202. Which of the following phases of the cell cycle is not a part of interphase?
a) S b) G_1 c) G_0 d) M
203. In which order, cytokinesis occurs in plants ;
a) Centripetal b) Centrifugal c) oblique d) Equatorail
204. Spindle formation can be disrupted by exposing cell to the microtubule poison such as
a) high concentration of oxygen b) vitamin A c) cholesterol d) colchicine
205. The number of DNA in chromosome at G_2 State of cell Cycle;
a) One b) Two c) Four d) Eight
206. Crossing over the results in genetic recombination in higher organisms occurs between -
a) Non -sister chromatids of a bivalent b) Two daughter nuclei
c) Two different bivalents d) Sister chromatids of a bivalents
207. _____ is the best stage to count the number and study the morphology of chromosomes.
a) Prophase b) Metaphase c) Anaphase d) Telophase
208. In salivary gland chromosomes/polytene chromosomes pairing is _____ .
a) Absent b) Occasional
c) Formed between non-homologous chromosomes
d) Formed between homologous chromosomes
209. In 'S' phase of the cell cycle:
a) Amount of DNA doubles in each cell.
b) Amount of DNA remains same in each cell.
c) Chromosome number is increased.
d) Amount of DNA is reduced to half in each cell.

210. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Division of nucleus	(i) Interphase
B. Division of cytoplasm	(ii) Cytokinesis
C. DNA replication	(iii) Syncytium

Column I	Column II
D. Karyokinesis not followed by cytokinesis	(iv) Karyokinesis

- a) A-(ii), B-(iv), C-(i), D-(iii) b) A-(iv), B-(ii), C-(i), D-(iii)
 c) A-(iv), B-(ii), C-(iii), D-(i) d) A-(iii), B-(ii), C-(iv), D-(i)

211. The complex formed by a pair of synapsed homologous chromosomes is called

- a) Kinetochore b) Bivalent c) Axoneme d) Equatorial plate

212. The chromosomes in which centromere is situated close to one end are:

- a) Acrocentric b) Telocentric c) Sub-metacentric d) Metacentric

213. Match the column - I with column - II and select the correct answer :

Column - I	Column - II
(A) Pachytene	(i) Bouquet stage
(B) Zygotene	(ii) Chiasma visible
(C) Diplotene	(iii) Terminalisation
(D) Leptotene	(iv) Gene exchange
(E) Diakinesis	(v) Synapsis

- a) A - i, B - ii, C-iii, D-iv, E-v b) A - iv, B - v, C-ii, D-i, E-iii
 c) A - iii, B - iv, C-v, D-ii, E-i d) A - ii, B - iii, C-iv, D-i, E-v

214. Meiosis is not having the one of the character out of the four given below

- a)
 It involves two stages of DNA replication, one before meiosis-I and another before meiosis - II
 b) It involves recombination and crossing over
 c) Sister chromatids separate during anaphase - II
 d) Nuclear membrane disappears during prophase

215. **Assertion:** During anaphase, centromere of each chromosome splits and chromatids separate.

Reason: During anaphase, chromatids move to opposite poles.

- a)
 If both assertion and reason are true and reason is the correct explanation of assertion
 b)
 If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false
 d) If both assertion and reason are false

216. Identify the different stages with respect to the above given features and select the correct option.

- (i) Thin thread like chromosomes with a beaded appearance
- (ii) Appearance of recombination nodules
- (iii) Formation of bivalents/tetrads
- (iv) Terminalisation of chiasmata
- (v) Appearance of chiasmata

a)

i	ii	iii	iv	v
Leptotene	Zygotene	Pachytene	Diplotene	Diakinesis

b)

i	ii	iii	iv	v
Leptotene	Zygotene	Pachytene	Diakinesis	Diplotene

c)

i	ii	iii	iv	v
Leptotene	Pachytene	Zygotene	Diakinesis	Diplotene

d)

i	ii	iii	iv	v
Leptotene	Pachytene	Diplotene	Zygotene	Diakinesis

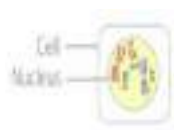
217. When the cell has started DNA replication, which check point should be predominantly activated?

- a) G_1/S b) G_2/M and M c) G_2/M d) M

218. The term "meiosis" was given by

- a) Johannsen b) Knoll and Ruska c) A. Flemming d) Farmer and Moore

219. Which of the following is correct regarding the given figure?



a)

Number of pairs of homologous chromosomes	Number of chromatids	Number of centromeres
3	6	12

b)

Number of pairs of homologous chromosomes	Number of chromatids	Number of centromeres
3	12	6

c)

Number of pairs of homologous chromosomes	Number of chromatids	Number of centromeres
6	6	12

d)

Number of pairs of homologous chromosomes	Number of chromatids	Number of centromeres
6	12	6

20. The enzyme recombinase is required at which stage of meiosis:

a) Pachytene b) Zygotene c) Diplotene d) Diakinesis

21. Read the following statements about cell division and select the correct ones.

(i) M phase represents the phase when actual cell division occurs and I phase represents the phase between two successive M phases.

(ii) In the 24 hours average duration of cell cycle of a human cell, cell division proper lasts for only about an hour.

(iii) M phase constitutes more than 95% of the duration of cell cycle

a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

22. Which of the following statements is correct?

a) Animals can show mitotic divisions in both haploid and diploid cells

b) After S phase the number of chromosomes becomes double i.e., $2n$ to $4n$.

c)

During the G_2 phase, proteins are synthesised in preparation for mitosis while cell growth continues.

d)

S or synthesis phase marks the period during which RNA synthesis takes place

23. Cells which are not dividing are likely to be at

a) G_1 b) G_2 c) G_0 d) S phase

24. Preparation phase of mitosis is

a) G_1 - phase b) S - Phase c) Prophase d) Interphase

25. At what phase of meiosis there are two cells, each with separated sister chromatids that have been moved to opposite spindle poles?

a) Anaphase II b) Anaphase I c) Telophase II d) Telophase I

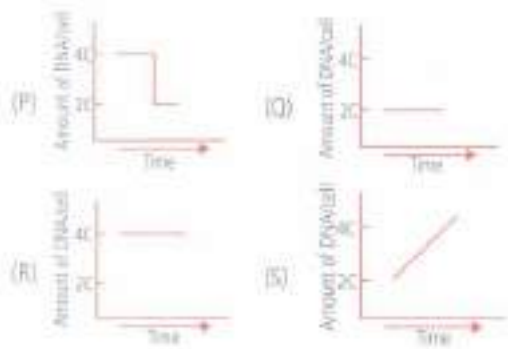
26. Given graphs P, Q, R and S show four stages of cell cycle i.e., G_1 , S, G_2 and M, but in random order. Identify the stages and match with the activities of the cell.

I. Taxol treatment, which prevents microtubule depolymerization, arrests the cell at this stage.

II. With a mitogen treatment, such as an epidermal growth factor, an arrested cell

at this stage proceeds to the next stage of the cell cycle.

III. The cell cycle check point at this stage confirms that DNA duplication is complete before the cell proceeds to the next stage.



- a) I - P, II - Q, III - R b) I - Q, II - S, III - R c) I - R, II - Q, III - S
d) I - P, II - S, III - Q

27. **Assertion:** Small disc-shaped structures at the surface of the centromeres are called kinetochores.

Reason: Kinetochores serve as the sites of attachment of spindle fibres to the centromeres.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false

d) If both assertion and reason are false

28. During G₂ - Phase a diploid cell contains the amount of DNA equal to a ;

- a) Diploid cell b) Tetraploid cell c) Haploid cell d) Nothing can be said

29. The movement of homologous chromosomes towards opposite poles occur by disassembly of spindle fibres during

- a) Anaphase b) Anaphase-I c) Anaphase-II d) Metaphase

30. Which of the following statements is correct regarding G₀ phase?

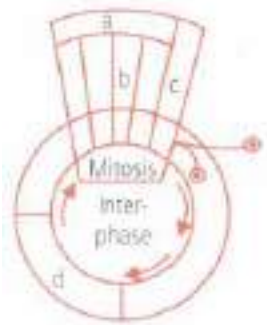
- a) Mitogens are present in G₀ phase.
b) Mitogens are present but energy rich compounds are absent.
c) Both mitogens and energy rich compounds are present.
d) Neither mitogens nor energy rich compounds are present.





31. In meiosis, how many cycles of chromosome division occurs?

- a) One b) Four c) Two d) Three

32. Lampbrush chromosomes occur during _____ .

- a) Prophase of mitosis b) Diplotene of meiosis c) Metaphase of meiosis
d) Interphase
233. The role of mitosis is not merely to divide a cell into two daughter cells but to ensure genetic continuity from one cell generation to another cell generation. The mechanism ensuring genetic continuity is
- a) formation of cells with new chromosomes
b) formation of two daughter cells c) formation of two cells with identical DNA
d) having the chromosome number between the two new cells.
234. The given figure is a schematic break-up of the phases/stages of cell cycle. Select the correct option regarding it.



- a) 'a' represents karyokinesis which is the division of cytoplasm.
b) 'b' is telophase which is just reverse of prophase.
c) 'c' is the best phase to count total number of chromosomes in any species.
d)
- In 'd' stage, replication of DNA takes place on the template of the existing DNA.
235. How many chromosome shall be present in a diploid cell at mitotic anaphse if its egg cell has ten chromosome;
- a) 10 (ten) b) 20 (twenty) c) 30 (thirty) d) 40 (Forty)
236. Which of the following is correct about bivalent?
- (i) Bivalents are tetrads.
(ii) A bivalent means 4 chromatids and 2 centromeres.
(iii) One bivalent consistsof 2 homologouschromosomes.
(iv) Bivalents form in zygotene
- a) (i), (ii), (iii) and (iv) b) (iii) only c) (iii) and (iv) d) (iv) only
237. Which of the following correctly shows a pair of homologous chromosomes at the start of meiosis?
- a) (a)  b) (b)  c) (c)  d) (d) 
238. If the number of bivalents are 8 in metaphase - I, what shall be the number of chromosomes in daughter cells after meiosis - I and meiosis -II respectively;

a) 8 and 4 b) 4 and 4 c) 8 and 8 d) 16 and 8

239. The given graph shows the change in DNA content during various phases (A to D) in a typical mitotic cell cycle. Identify the phases and select the correct option.



a)	b)	c)	d)																																
<table border="1"> <tr><td>A</td><td>B</td><td>C</td><td>D</td></tr> <tr><td>G₂</td><td>G₁</td><td>S</td><td>M</td></tr> </table>	A	B	C	D	G ₂	G ₁	S	M	<table border="1"> <tr><td>A</td><td>B</td><td>C</td><td>D</td></tr> <tr><td>G₂</td><td>S</td><td>G₁</td><td>M</td></tr> </table>	A	B	C	D	G ₂	S	G ₁	M	<table border="1"> <tr><td>A</td><td>B</td><td>C</td><td>D</td></tr> <tr><td>G₁</td><td>S</td><td>G₂</td><td>M</td></tr> </table>	A	B	C	D	G ₁	S	G ₂	M	<table border="1"> <tr><td>A</td><td>B</td><td>C</td><td>D</td></tr> <tr><td>M</td><td>G₁</td><td>S</td><td>G₂</td></tr> </table>	A	B	C	D	M	G ₁	S	G ₂
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G ₁	S	G ₂	M																																
A	B	C	D																																
M	G ₁	S	G ₂																																

240. Division of centromere occurs in;
 a) Prophase b) Metaphase c) Anaphase d) Telophase
241. In which stage DNA replication takes place?
 a) Metaphase b) G₁-phase c) S-phase d) G₂-phase
242. Select the correct option with respect to mitosis
 a)
 Chromosomes move to the spindle equator and get aligned along the equatorial plate in metaphase
 b) Chromatids separate but remain in the centre of the cell in anaphase
 c) Chromatids start moving towards opposite poles in telophase.
 d)
 Golgi complex and endoplasmic reticulum are still visible at the end of prophase.
243. Meiosis-II performs _____.
 a) Separation of sex chromosomes b) Synthesis of DNA and centromeres
 c) Separation of homologous chromosomes d) Separation of chromatids
244. Slipping of chiasmata towards the ends bivalent is called ;
 a) Terminalisation b) Diakinesis c) Interkinesis d) Heterpynosis
245. Splitting of centromere and hence separation of chromatids occur during
 a) anaphase of mitosis b) anaphase of meiosis I c) anaphase of meiosis II
 d) both (a) and (c)
246. A contractile mid body forms during cytokinesis in;
 a) Animals b) Higher Plants c) Fungi d) Algae
247. Bacterium divides every 35 minutes. If a culture containing 10^5 cells per mL is grown for 175 minutes, what will be the cell concentration per mL after 175 minutes?
 a) 5×10^5 cells b) 35×10^5 cells c) 32×10^5 cells d) 175×10^5 cells
248. Crossing over occurs during

- a) Pachytene b) Diplotene c) Diakinesis d) Zygotene
249. Mitotic spindle is mainly composed of _____ proteins.
a) tubulin b) myosin c) actin d) actomyosin
250. During which stage a diploid cell becomes tetraploid in mitosis ;
a) G_2 b) Prophase c) Metaphase d) Anaphase
251. Cell would normally proceed to mitosis without interruption
a) once it has entered the S phase b) once it has entered the G_2 phase
c) at any time during cell division activity d) none of these.
252. During meiosis I, chromosome number
a) is reduced to half b) doubles up c) remains the same d) either (a) or (b)
253. The members of a homologous pair of chromosomes
a) are identical in size and appearance
b) contain identical genetic information
c) separate and move to opposite poles of the cell during mitosis
d) are found only in haploid cells
254. Which of the following is most important point in the regulation of cell cycle during which it must decide whether the cell will start a new cycle or will become arrested in G_0 phase?
a) S-phase b) G_1 -phase c) G_2 -phase d) Interphase
255. Identify the given figures showing meiotic phases and select the correct option.



a)

A	B	C
Metaphase	Anaphase	Telophase

b)

A	B	C
Metaphase I	Anaphase I	Telophase I

c)

A	B	C
Metaphase II	Anaphase II	Telophase II

d)

A	B	C
Anaphase I	Metaphase I	Telophase I

256. Phragmoplast is related to
a) division of nucleolus b) cell elongation c) cytokinesis
d) assemblage of chromosomes at metaphase.
257. In which of the following ways are mitosis and meiosis similar?

- a) Both have pairing of homologous chromosomes
b) Both are preceded by DNA replication. c) Both occur in all kinds of cells.
d) Both include separation of paired chromosomes
258. During anaphasic movements of chromosomes, _____ of each chromosome is/are towards the pole and _____ of the chromosome trail(s) behind.
a) centromere, arms b) arms, centromere c) chromatids, centromere
d) none of these
259. Dissolution of the synaptonemal complex occurs during;
a) Diplotene b) Leptotene c) Pachytene d) Zygotene
260. In cell Cycle. which stage is misnomerly called resting during ;
a) S - Phase b) Telophase c) Cytokinesis d) Interphase
261. Pairing of homologous chromosomes is called
a) Disjunction b) Synapsis c) segregation d) Polyteny
262. The cells that do not divide further, exit G_1 phase to enter an inactive stage called _____ of the cell cycle.
a) M stage b) G_2 stage c) S stage d) G_0 stage
263. The number of chromosomes is reduced to half during
a) mitosis b) meiosis II c) meiosis I d) fertilisation.
264. **Assertion:** G_1 phase is the interval between mitosis and initiation of DNA replication
Reason: The cell is metabolically inactive during G_1 phase.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false
d) If both assertion and reason are false
265. Meiosis occurs in organisms during:
a) sexual reproduction b) vegetative reproduction
c) both sexual and vegetative reproduction d) none of these.

**RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308****Time : 1 Mins****TRANSPORT IN PLANTS 1****Marks : 800**

- Roots play insignificant role in absorption of water in____
a) Pistia b) Pea c) Wheat d) Sunflower
- In passive transport across a membrane, when two protein molecules move in opposite direction it is called as
a) uniport b) antiport c) symport d) co-port
- Less negative T.P. and first sign of shrinkage of protoplasm of cell is detectable at
a) Limiting plasmolysis b) Incipient plasmolysis c) Evident plasmolysis
d) Permanent plasmolysis
- Rupture and fractionation of water column present in tracheary elements does not occur during ascent of sap due to :
a) Transpiration pull b) Weak gravitational pull c) Cohesion and adhesion
d) Lignified thick walls
- Root system in a plant is well developed_____
a) due to deficiency of auxins b) due to deficiency of cytokinins
c) due to deficiency of minerals d) for increased absorption of water
- Facilitated diffusion
a) needs a carrier protein
b) All vertebrates are chordates and all chordates are vertebrates
c) occurs against the concentration gradient d) occurs against the concentration gradient
- The movement of water from one cell of the cortex to the adjacent one in roots is due to_____
a) accumulation of inorganic salts in the cells
b) accumulation of organic compounds in the cells c) chemical potential gradient
d) water potential gradient
- Water will move from the root hair through cortex if the water potentials are:
a)

Root hair	Cortex	Xylem
0	0	0

b)

Root hair	Cortex	Xylem
-2	-1	0

c)

Root hair	Cortex	Xylem
0	-1	-2

d)

Root hair	Cortex	Xylem
0	-1	+2
- The practice of breaking of rocks during rainy season by inserting wooden pegs in them is based on the phenomenon of

a) imbibition pressure b) turgor pressure c) osmotic pressure d) wall pressure

10. Which of the following is an effective adaptation for better gas exchange in plants?

- a) Presence of multiple epidermis b) Presence of hair on the lower epidermis
c) Presence of waxy cuticle covering the epidermis of the leaves
d)

The location of the stomata primarily on the lower surface of the leaf, the side turned away from the direct sun rays

11. The most important factor for absorption of water in plants is

- a) living cell b) force of capillarity c) imbibition d) cohesive force of water

12. Match column I with column II and select the correct option from the codes given below.

Column I		Column II
A. Dixon and Jolly	(i)	Root pressure
B. Stomata	(ii)	Only water available to plants
C. Manometer	(iii)	Transpiration
D. Capillary water	(iv)	Transpiration pull
E. Potometer	(v)	Rate of transpiration

- a) A-(iv), B-(iii), C-(v), D-(ii), E-(i) b) A-(i), B-(iii), C-(iv), D-(ii), E-(v)
c) A-(iv), B-(iii), C-(i), D-(ii), E-(v) d) A-(v), B-(iv), C-(iii), D-(ii), E-(i)

13. In the following question, a statement of assertion is followed by a statement of reason.

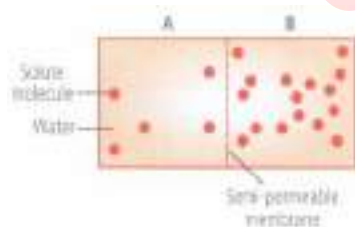
Mark the correct choice as :

Assertion: More is the number of solute molecules, the lower (more negative) is Ψ_W .

Reason: Presence of solute particles reduces the free energy of water and thus decreases the water potential.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

14. Based on the figure given below which of the following statements is not correct?



- a) Movement of solvent molecules will take place from chamber A to B.
b) Movement of solute will take place from A to B.
c) Presence of a semi-permeable is a pre-requisite for this process to occur.
d)

The direction and rate of osmosis depends on both the pressure gradient and concentration gradient.

15. An innovative professor who wanted to give a live demonstration of a physiological process, filled a glass bottle with previously moistened mustard seeds and water. He screwcapped the bottle and kept it away in a corner and resumed his lecture. Towards the end of his lecture

there was a sudden explosion with glass pieces of bottle thrown around.

Which of the following phenomena did the professor want to demonstrate?

- a) Diffusion b) Osmosis c) Anaerobic respiration d) Imbibition

16. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: The isobilateral leaf has equal number of stomata on both surfaces.

Reason: The dorsiventral leaf has greater number of stomata on upper surface.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

17. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Vein ending	(i) Transpiration
B. Necessary evil	(ii) Osmosis
C. Semi-permeable membrane	(iii) Transpiration pull
D. Cohesion	(iv) Guttation
E. Stomata closure	(v) ABA

- a) A-(iv), B-(i), C-(iii), D-(ii), E-(v) b) A-(iv), B-(i), C-(ii), D-(iii), E-(v)
c) A-(iii), B-(v), C-(i), D-(ii), E-(iv) d) A-(i), B-(ii), C-(iii), D-(iv), E-(v)

18. Ringing/girdling experiments demonstrate

- a) phloem is responsible for translocation of food b) xylem is responsible for ascent of sap
c) transpiration pull d) both (a) and (b).

19. Stomata open and close due to _____

- a) circadian rhythm b) genetic clock c) pressure of gases inside the leaves
d) turgor pressure of guard cells

20. The process responsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is _____.

- a) Imbibition b) Plasmolysis c) Transpiration d) Root Pressure

21. Which of the following occupies the space between the cell wall and the shrunken protoplast in a plasmolysed cell?

- a) Isotonic solution b) Hypotonic solution c) Hypertonic solution d) Water

22. Which of the following equation is wrong for a normal cell?

- a) $\Psi_s = -OP$ b) $DPD = OP + TP$ c) $\Psi_w = \Psi_s + \Psi_p$ d) $OP = CRT$

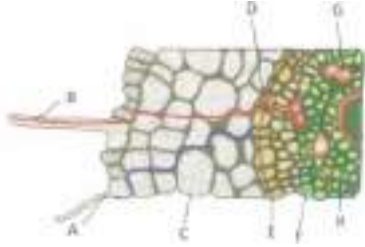
23. Water moves up against gravity and even for a tree of 20 m height, the tip receives water within two hours. The most important physiological phenomenon which is responsible for the upward movement of water is _____.

- a) guttation b) evaporation c) transpiration d) none of these

24. Organic substances such as sugars are translocated in the phloem. It can be demonstrated by

- a) ringing the stem b) root pressure c) girdling d) defoliation.

25. Refer to the given figure. Identify the labelled parts (A-H) and select the correct option.



a)

A - Symplastic path; B - Apoplastic path; C-Cortex; D - Endodermis; E-Casparian strips; F- Pericycle; G - Xylem; H - Phloem

b)

A - Apoplastic path; B - Symplastic path; C-Cortex; D - Endodermis; E-Casparian strips; F- Pericycle; G - Xylem; H - Phloem

c)

A - Apoplastic path; B - Symplastic path; C-Cortex; D - Endodermis; E-Casparian strips; F- Pericycle; G - Phloem; H - Xylem

d)

A - Symplastic path; B - Apoplastic path; C-Cortex; D - Endodermis; E-Casparian strips; F- Pericycle; G - Phloem; H - Xylem

26. Read the given statements and select the correct ones.

- (i) A membrane which permits the passage of pure solvent molecules to pass through it and not the solute particles is called semi-permeable.
- (ii) A membrane which allows some substances to pass through it more readily than others is known as selectively! differentially permeable.
- (iii) All living biological membranes are perfectly semipermeable.

a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

27. Following are the differences between apoplast pathway and symplast pathway.

	Apoplast pathway	Symplast pathway
(i)	It consists of nonliving parts of plant body, i.e., cell walls and intercellular spaces.	It consists of living parts of plant body, i.e., protoplasts connected by plasmodesmata.
(ii)	There is little resistance in the movement of water.	Some resistance occurs in the movement of water through symplast.
(iii)	It is slightly slower.	It is faster.
(iv)	Metabolic state of root directly affects apoplast pathway.	Metabolic state of root does not affect symplast pathway.

Which of the given differences is/are incorrect?

a) (iii) only b) (i) and (iii) only c) (iii) and (iv) only d) (ii) and (iii) only

28. The manufactured food in a green plant moves from the leaves to other parts through

a) xylem b) phloem c) cortex d) pith

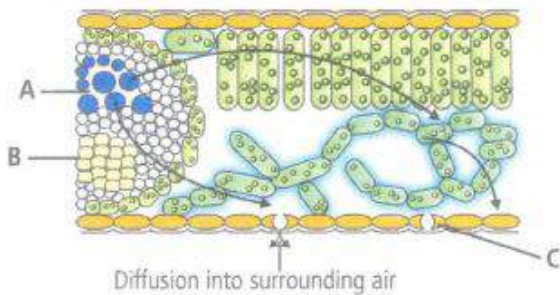
29. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: A plant cell shrinks in hypertonic solution.

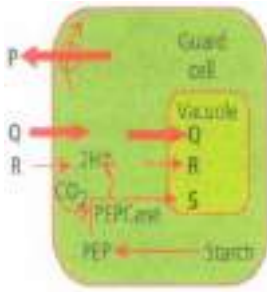
Reason: In hypertonic solution, water moves out of the cells due to plasmolysis.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
30. A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested chemically. Which one of the following test results indicates that it is phloem sap?
 a) Absence of sugar b) Acidic c) Alkaline d) Low refractive index
31. Refer to the given figure and select the option which correctly identifies A, B and C.



- a)
- | | | |
|-------|--------|---------------|
| A | B | C |
| Xylem | Phloem | Stomatal pore |
- b)
- | | | |
|--------|-------|---------------|
| A | B | C |
| Phloem | Xylem | Stomatal pore |
- c)
- | | | |
|--------|-------|------------|
| A | B | C |
| Phloem | Xylem | Guard cell |
- d)
- | | | |
|-------|--------|------------|
| A | B | C |
| Xylem | Phloem | Guard cell |

32. Unidirectional flow of water, minerals, some organic nitrogen and hormones occurs through
 a) xylem b) phloem c) root d) vascular tissue.
33. The lower surface of leaf will have more number of stomata in a:
 a) dorsiventral leaf b) isobilateral leaf c) both (a) and (b) d) none of these.
34. Which of the following biological membranes is semipermeable?
 a) Fish and animal bladders b) Egg membrane c) Plasma membrane of cell
 d) All of these
35. A girdled plant (upto bast) may survive for some time but it will eventually die, because
 a) water will not move downwards b) water will not move upwards
 c) sugars and other organic materials will not move downwards
 d) sugars and other organic materials will not move upwards.
36. Stomatal opening and closing involves the role of various ions. In the given figure, arrows depict the movement of certain ions during stomatal opening in light. Identify the ions (P, Q, R and S) and select the correct option.



a)

P	Q	R	S
H ⁺	K ⁺	Cl ⁻	Malate ²⁻

b)

P	Q	R	S
K ⁺	H ⁺	Cl ⁻	Malate ²⁻

c)

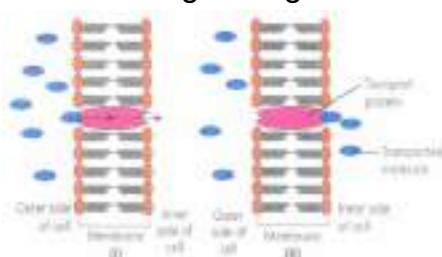
P	Q	R	S
H ⁺	K ⁺	Cl ⁻	Malate ²⁻

d)

P	Q	R	S
K ⁺	Malate ²⁻	H ⁺	Cl ⁻

37. The type of diffusion in which substances move across the membrane along their concentration gradient in the presence of certain carriers or transport proteins is called as
 a) simple diffusion b) facilitated diffusion c) osmosis d) active transport.
38. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Mass or bulk flow is the movement of substances in bulk from source to sink as a result of pressure differences.
Reason: Water, minerals and food are generally moved by mass flow.
 a) If assertion is true but reason is false. b) If both assertion and reason are false.
 c) If both assertion and reason are true and reason is the correct explanation of assertion
 d)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
39. The given table shows properties of four cells systems A, B, C and D. The maximum rate of inward diffusion of water will be observed in which of these systems?
- | System | Intracellular concentration of water | Extracellular concentration of water |
|--------|--------------------------------------|--------------------------------------|
| A | 0.09 M | 0.11 M |
| B | 0.2 M | 0.5 M |
| C | 0.05 M | 0.7 M |
| D | 0.03 M | 0.6 M |
- a) System A b) System B c) System C d) System D
40. When water moves through a semi permeable membrane then which of the following pressure develops?
 a) O.P b) S.P c) T.P d) W.P
41. Read the given statements and select the correct option.
Statement 1: Xylem transport is unidirectional.
Statement 2: Phloem transport is bi-directional.
 a) Both statements 1 and 2 are correct.
 b) Statement 1 is correct but statement 2 is incorrect.
 c) Statement 1 is incorrect but statement 2 is correct.
 d) Both statements 1 and 2 are incorrect.
42. What is the direction of movement of sugars in phloem?
 a) Upward b) Downward c) Bi-directional d) Non-multidirectional

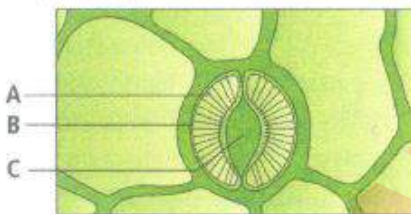
43. Phloem in gymnosperms lacks _____
a) Sieve tubes only b) Companion cells only c) Both sieve tubes and companion cells
d) Albuminous cells and sieve cells
44. Read the given statements and select the correct option.
Statement 1: It becomes difficult to open and shut the wooden doors and windows during rainy season.
Statement 2: Wooden doors and windows imbibe water in rainy season and thus their volume is increased.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
45. Multi-directional flow of a variety of organic and inorganic solutes occurs through
a) xylem b) vascular tissue c) phloem d) root
46. Water potential of a flaccid cell will be:
a) $\Psi_W = \Psi_S$ b) $\Psi_S = \Psi_P$ c) $\Psi_W = 0$ d) $\Psi_W = \Psi_S - \Psi_P$
47. Water vapour comes out from the plant leaf through the stomatal opening. Through the same stomatal opening carbon dioxide diffuses into the plant during photosynthesis. Reason out the above statements using one of following options _____ .
a) Both processes cannot happen simultaneously
b)
Both processes can happen together because the diffusion coefficient of water and CO_2 is different.
c) The above processes happen only during night time
d) One process occurs during day time, and the other at night.
48. Movement of solvent molecule from a region of its higher concentration to a region of its lower concentration through a semi-permeable membrane, is referred to as
a) simple diffusion b) facilitated diffusion c) osmosis d) active transport.
49. In a terrestrial habitat which of the following is affected by temperature and rainfall condition?
a) Translocation b) Transpiration c) Transformation d) Thermodenaturation
50. The most important function of transpiration in plants is to cause
a) Loss of surplus water b) Cooling of the plant c) Rapid ascent of sap
d) Rapid rise of minerals
51. Refer to the given figure. What does it represent?



- a) Simple diffusion b) Facilitated diffusion c) Osmosis d) Active transport

52. The transpiration-driven ascent of xylem sap depends mainly upon _____ property of water.
a) cohesion b) adhesion c) surface tension d) all of these
53. In succulent plants the stomata opens at night and closes by day. Which of following would be best hypothesis to explain the mechanism of stomata opening at night only?
a) CO_2 used up, increased pH results in accumulation of sugars
b) CO_2 accumulates, reduces pH stimulates enzymes resulting in accumulation of carbohydrate
c) Increase in CO_2 concentration, conversion of organic acids into starch resulting in the increased uptake of potassium ions and water
d) High CO_2 concentration causes accumulation of organic acids in guard cells resulting in to the increased concentration of cell sap

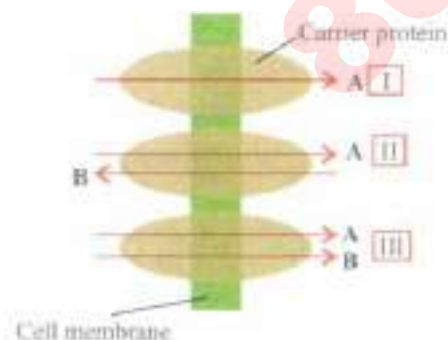
54. Refer to the given figure.



- Select the correct statement regarding the labelled parts A-C.
a) The inner wall of B towards C is thick and elastic.
b) The opening and closing of the stomata is due to change in the turgidity of B.
c) The opening of the stoma is aided due to the orientation of A in the cell walls of B.
d) All of these
55. In a flaccid cell which condition does not occur
a) $\text{TP} = 0$ b) $\text{SP} = 0$ c) $\text{WP} = 0$ d) $\text{SP} = \text{OP}$
56. The spraying of phenyl mercuric acetate in leaves _____
a) increases transpiration b) reduces transpiration c) increases rate of photosynthesis
d) causes guttation
57. Which option is true for a fully turgid cell?
a) $\text{OP} = \text{DPD}$ b) $\text{OP} = \text{Zero}$ c) $\text{DPD} = \text{Zero}$ d) $\text{TP} = \text{Zero}$
58. In guard cells when sugar is converted into starch the stomatal pore _____
a) opens fully b) opens partially c) closes completely d) remains unchanged
59. Osmotic concentration of a cell kept in water is chiefly regulated by:
a) Vacuoles b) Plastids c) Ribosomes d) Mitochondria
60. When transpiration is rapid
a) Ψ_w of epidermal cells decreases b) A negative pressure develops in xylem vessel
c) Water is absorbed through the root passively d) All of these
61. Guard cells help in _____

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- a) transpiration b) guttation c) fighting against infection d) protection against grazing
62. In the mechanism of opening of stomata, the important factor is
 a) Turgidity of the guard cells b) Chlorophyll content of the guard cells
 c) Hormone content of the subsidiary cells d) Protein content of the epidermal cells
63. Transpiration and root pressure cause water to rise in plants by _____
 a) Pulling and pushing it, respectively b) Pushing it upward
 c) Pushing and pulling it, respectively d) Pushing it upward
64. Which one of the following structures between two adjacent cells is an effective transport pathway?
 a) Plasmalemma b) Plasmodesmata c) Plastoquinone d) Endoplasmic reticulum
65. Root pressure develops due to _____
 a) Low osmotic potential in soil b) Passive absorption c) Increase in transpiration
 d) Active absorption
66. Select the incorrect statement regarding imbibition.
 a)
 Imbibition is the phenomenon of adsorption of water or any other liquid without forming solution.
 b) The liquid which is imbibed is called as imbibate.
 c) There occurs a decrease in volume of imbibant during imbibition
 d) Water is absorbed by germinating seeds through imbibition.
67. The bulliform cells of leaves lose their turgidity during excessive
 a) assimilation b) transpiration c) photosynthesis d) respiration
68. Water moves from a cell with _____ DPD to a cell with _____ DPD.
 a) higher, lower b) lower, higher c) lower, lower d) higher, higher
69. The given figure shows transport of two molecules A and B through three different modes of facilitated diffusion. Select the correct option regarding it.



a)

I	II	III
Uniport	Symport	Antiport

b)

I	II	III
Uniport	Antiport	Symport

c)

I	II	III
Antiport	Uniport	Symport

d)

I	II	III
Antiport	Symport	Uniport

70. If the solute is added in the given solution than what observation can be made

- a) Its DPD decreases b) It's water potential decreases
c) DPD & water potential remains unchanged d) Its water potential increases
71. The pathway of water from soil upto the secondary xylem
a) Soil → root hair → cortex → endodermis → pericycle → protoxylem → Metaxylem
b) Metaxylem → protoxylem → pericycle → cortex → endodermis → Soil → root hair
c) Cortex → root hair → → endodermis → pericycle → protoxylem → Metaxylem
d) pericycle → Soil → root hair → cortex → endodermis → Protoxylem → Metaxylem
72. Use of excessive fertilisers causes wilting due to
a) endosmosis b) exosmosis c) imbibition d) none of these.
73. The plant cell cytoplasm is surrounded by both cell wall and cell membrane. The specificity of transport of substances is mostly across the cell membrane, because
a) cell membrane is impermeable b) cell membrane is selectively permeable
c) cell membrane is fully permeable d) cell wall is impermeable
74. Which of the following facilitates opening of stomatal aperture?
a) Contraction of outer wall of guard cells b) Decrease in turgidity of guard cells
c) Radial orientation of cellulose microfibrils in the cell wall of guard cells
d) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
75. Which of the following statements is correct?
a) Cells shrink in hypertonic solution and swell in hypotonic solution
b) Imbibition is a special type of diffusion when water is absorbed by non living parts.
c) Most of water flow in the roots occur via the apoplast d) All of these
76. Select the incorrect statement regarding facilitated diffusion.
a) It is a very specific process b) It is a passive process
c) It helps the hydrophilic substances to be transported across the membrane
d) It is faster than active process.
77. Two cells A and B are contiguous. A has OP = 10 atm, TP = 7 atm and DPD = 3 atm. B has OP = 8 atm, TP = 3 atm, DPD = 5 atm. The result would be :
a) No movement of water b) Equilibrium between the two
c) Movement of water from A to B d) Movement of water from B to A
78. The water potential of pure water is _____
a) Less than zero b) More than zero but less than one c) More than one d) zero
79. Which of the following is used to determine the rate of transpiration in plants?
a) Porometer b) potometer c) Auxanometer d) Tensiometer
80. A plasmolysed cell can be deplasmolysed by placing it in
a) pure water or hypotonic solution b) hypertonic solution c) isotonic solution
d) saturated solution.
81. The most important factor affecting transpiration is
a) Light b) Temperature c) Wind d) Atmospheric humidity
82. Which one of the following will not directly affect transpiration?
a) Temperature b) Light c) Wind speed d) Chlorophyll content of leaves

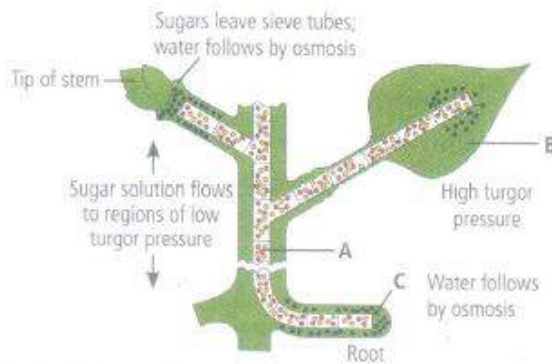
83. If a cell is placed in a hypertonic solution then y_w of the cell will be
a) Increased b) Decreased c) Unchanged d) First increases then decreases

84. The given diagram shows a potato plant forming new tubers.
Which route would be taken by most of the food at this time?

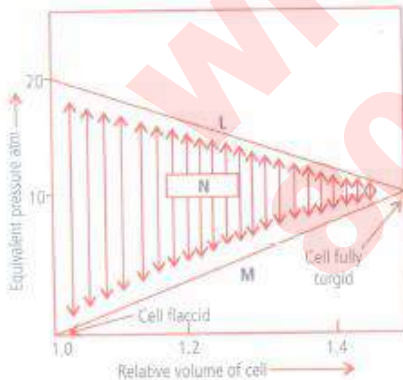


- a) 1 → 4 → 2 → 3 b) 6 → 5 → 2 → 3 c) 1 → 4 → 5 → 6 d) 6 → 5 → 4 → 1
85. When the stomata are opening; we observe following changes in the guard cells?
a) OP increase, TP decreases b) OP & TP increases c) OP decreases, TP increases
d) OP & TP decreases
86. The water potential of pure water is:
a) Zero b) Less than zero c) More than zero but less than one d) More than one
87. Uphill transport i.e., movement of substances from their lower concentration to their higher concentration occurs in
a) simple diffusion b) facilitated diffusion c) active transport d) both (b) and (c).
88. In a fully turgid cell
a) $\Psi_W = \Psi_S + \Psi_P$ b) $\Psi_W = \text{zero}$ c) $\Psi_W - \Psi_S - \Psi_P$ d) $\Psi_W = \Psi_S = \Psi_P$
89. The direction and rate of water movement from cell to cell is based on____
a) WP b) TP c) DPD d) incipient plasmolysis
90. Identify the incorrect statement____
a) Sapwood is the innermost secondary xylem and is lighter in colour.
b) Due to deposition of tannins, resins, oils etc., heart wood is dark in colour.
c) Heart wood does not conduct water but gives mechanical support.
d) Sapwood is involved in conduction of water and minerals from root to leaf
91. Ascent of sap is best explained by
a) mass (bulk) flow b) pulsation theory c) root pressure
d) cohesion-tension transpiration pull
92. The concentration of solute in four cells is 0.4 M. They are placed in four separate containers I, II, III and IV, filled with saline water of concentrations 0.1 M, 0.4 M, 2 M and 3M respectively. In which container will the cell swell?
a) I b) II c) III d) IV
93. Which helps in maintaining form and structure of cells & soft parts of plants?
a) Osmotic pressure b) Turgor pressure c) Atmospheric pressure d) DPD

94. Refer to the given figure representing mechanism of translocation and select the option which correctly identifies A, B and C.



- a) A-Phloem; B-Sugars enter sieve tube; C-Sugars leave sieve tube
 b) A-Xylem; B-Sugars enter sieve tube; C-Sugars leave sieve tube
 c) A-Xylem; B-Sugars leave sieve tube; C-Sugars enter sieve tube
 d) A-Phloem; B-Sugars leave sieve tube; C-Sugars enter sieve tube
95. The hydrostatic pressure developed inside the cell on the cell wall due to endosmosis is called
 a) osmotic potential b) diffusion pressure c) wall pressure d) turgor pressure
96. The rupture and fractionation do not usually occur in the water column in vessel/tracheids during the ascent of sap because of _____.
 a) lignified thick walls b) cohesion and adhesion c) weak gravitational pull
 d) transpiration pull e) rapid turgor pressure changes
97. The osmotic expansion of a cell kept in water is chiefly regulated by:
 a) Mitochondria b) Vacuoles c) Plastids d) Ribosomes
98. Given diagram illustrates the changes that occur when a plant cell takes up water. Identify L, M, N and select the incorrect statement regarding the given diagram.



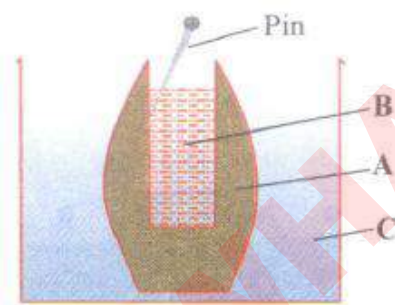
- a) N is the diffusion pressure deficit which becomes zero when L and M are equal in magnitude.
 b) In a flaccid cell, value of N becomes equal to that of L.
 c) M represents osmotic pressure, which increases when a flaccid cell takes up water.
 d) L represents solute potential, which decreases with the increase in turgidity of the cell.
99. Meaningful girdling (ringing) experiment cannot be performed within sugarcone _____.
 a) its phloem is situated interior to xylem b) its stem surface is covered with wax coating
 c) its vascular bundles are not present in a ring d) its stem is thin
100. Cell wall of plant cell is
 a) semi-permeable b) selectively permeable c) fully permeable d) impermeable

101. Two cells A and B are contiguous. Cell A has osmotic pressure 10 atm, turgor pressure 7 atm and diffusion pressure deficit 3 atm. Cell B has osmotic pressure 8 atm, turgor pressure 3 atm and diffusion pressure deficit 5 atm. The result will _____ .
a) no movement of water b) equilibrium between the two
c) movement of water from cell A to B. d) movement of water from cell B to A.
102. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: During apoplastic movement of water, water travels through the cells and their cytoplasm.
Reason: The symplastic movement of water occurs exclusively through the intercellular spaces and the walls of the cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
103. When a plant undergoes senescence, the nutrients may be
a) accumulated b) bound to cell wall c) translocated d) none of these
104. Two adjacent cells A and B are being studied. Cell A has OP of 10 atm and TP of 6 atm. Cell B has OP of 10 atm and TP of 4 atm. Movement of water will occur from:
a) cell A to cell B b) cell B to cell A c) no movement of water d) cannot be determined
105. The form of sugar transported through phloem is
a) glucose b) fructose c) sucrose d) ribose.
106. In _____ pathway, water crosses at least two membranes for each cell in its path (i.e., plasma membrane on entering and exiting).
a) apoplast b) symplast c) transmembrane d) both (a) and (c)
107. The water potential and osmotic potential of pure water are _____
a) 100 and zero b) zero and zero c) 100 and 200 d) zero and 100
108. Which of the following is an example of imbibition?
a) Uptake of water by root hair b) Exchange of gases in stomata
c) Swelling of seed when put in soil d) Opening of stomata
109. Which of the following substance serve as an anti-transpirant in plant?
a) Phenyl mercuric acetate b) Aspirin c) Silicon oil d) All of these
110. If cell A with DPD 5 atm is surrounded by many cells with DPD 4 atm then
a) the net movement of water will be from cell A to the surrounding cells
b) the net movement of water will be from cell A to the surrounding cells
c) water will not move at all d) water movement will depend on other unknown factors.
111. If a cell A with DPD = 5 bars is connected to cells B and D, whose OP and TP are respectively 5 and 5, 10 and 4, and 8 and 3, the flow of water will be:
a) C to A B and D b) A and D to B and C c) A to B, C and D d) B to A, C and D.

112. Absorption of water from soil by seeds increases the ____ thus helping seedlings to come out of soil.
a) DPD b) diffusion pressure c) imbibition pressure d) solute potential
113. Mass flow hypothesis was first described by
a) Swanson b) Buchman c) Kursanov d) Munch
114. Read the given statements and select the correct option.
Statement 1: Plant cells do not rupture when placed in distilled water.
Statement 2: Animal cells rupture when placed in distilled water.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
115. When a fresh-water protozoan possessing a contractile vacuole, is placed in a glass containing marine water, the vacuole will ____
a) increase in number b) disappear c) increase in size d) decrease in size
116. The translocation of organic solutes in sieve tube members is supported by :
a) Root pressure and transpirational pull b) P-Proteins
c) Mass flow involving a carrier and ATP d) Cytoplasmic streaming
117. Osmotic pressure in the leaf cells is positive during ____
a) excessive transpiration b) low transpiration c) excessive absorption d) guttation
118. Pressure exerted by cell wall to balance turgor pressure is called
a) wall pressure b) DPD c) water potential d) osmotic pressure.
119. Concentration of minerals in the soil is usually _____ than the concentration of minerals in the root.
a) lower b) higher c) similar d) none of these
120. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: The positive pressure that develops in the plant cell due to entry of water is called turgor pressure.
Reason: The turgor pressure is responsible for enlargement and extension during growth of cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
121. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Capillary water is not readily available to the plants as it lies below the level of roots.
Reason: Gravitational water constitutes the only water available to the plants.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
122. To initiate cell plasmolysis, the salt solution should be
a) isotonic b) hypertonic c) hypotonic d) none of these.
123. Salt is added to preserve meat, pickles, etc. because salting kills bacteria by the process of
a) dissolution b) distillation c) plasmolysis d) imbibition
124. Water potential can be obtained by _____.
a) $OP + TP$ b) $OP = WP$ c) $\psi_s + \psi_p$ d) $OP - DPD$
125. Which of the following elements are most readily mobilised?
a) Phosphorus, sulphur, nitrogen and potassium
b) Calcium, sulphur, nitrogen and phosphorus
c) Phosphorus, sulphur, nitrogen and calcium d) Potassium, sulphur, nitrogen and calcium
126. Cohesion-tension theory of "ascent of sap" was given by
a) Godlewski b) Dixon and Jolly c) Tansley d) Sir J.C. Bose
127. Guttation is caused by_____
a) transpiration b) osmosis/DPD c) root pressure d) osmotic pressure
128. In soil, water available for roots (to plants) is_____
a) capillary water b) hygroscopic water c) gravitational water d) chemically bound water
129. If turgidity of a cell surrounded by water increases, the wall pressure will _____.
a) increase b) decrease c) fluctuate d) remain unchanged
130. Some of the growth regulators affect stomatal opening. Closure of stomata is brought about by_____
a) indole butyric acid b) abscisic acid c) kinetin d) gibberellic acid
131. Match column I with column II and select the correct option from the codes given below.
- | Column I | Column II |
|---------------|-----------------------------------|
| A. Hypotonic | (i) No net flow of water |
| B. Hypertonic | (ii) Water moves into the cell |
| C. Isotonic | (iii) Water moves out of the cell |
- a) A-(ii), B-(iii), C-(i) b) A-(iii), B-(ii), C-(i) c) A-(i), B-(ii), C-(iii) d) A-(ii), B-(i), C-(iii)
132. Specialised epidermal cells surrounding the guard cells are called
a) Complementary cells b) Subsidiary cells c) Bulliform cells d) Lenticels
133. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: The loss of water in its liquid phase from the leaves is called guttation.
Reason: Guttation takes place at night only.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

134. Swelling of wooden plants and door-penals during the rainy season is due to
a) Imbibition b) Endosmosis c) Deplasmolysis d) Diffusion
135. Read the given statements and select the correct option.
Statement 1: The process of diffusion does not require any input of energy.
Statement 2: Diffusion involves movement of particles from a region of higher concentration to a region of lower concentration.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect
136. Which of the following statements is incorrect?
a) Endodermis is impervious to water due to the presence of suberised Casparian strips.
b) Xylem vessels and tracheids, being non-living, are parts of the apoplast
c) Ascent of sap is best explained by root pressure theory. d) None of these
137. Mainly conduction of water in an angiosperm occurs through _____
a) tracheid b) xylem vessels c) sieve tubes d) All of these
138. The given figure shows set up of potato osmoscope experiment. Select the option that correctly identifies the labels A, B and C.



a)

A	B	C
Peeled potato	Water	Sugar solution

b)

A	B	C
Peeled potato	Sugar solution	Water

c)

A	B	C
Unpeeled potato	Sugar solution	Water

d)

A	B	C
Unpeeled potato	Water	Sugar solution

139. On a warm summer day, the transpiration pull is the main force that drives from root parenchyma into the root xylem. The table shows values of Ψ_P (pressure potential) and Ψ_S (solute potential) in root xylem and root parenchyma, in kPa. In which of the options (a-d) would transpiration pull cause water to move from root parenchyma into the root xylem?

a)

Root parenchyma		Root xylem	
Ψ_P	Ψ_S	Ψ_P	Ψ_S
200	-190	-200	5

b)

Root parenchyma		Root xylem	
Ψ_P	Ψ_S	Ψ_P	Ψ_S
-200	220	65	-5

c)

Root parenchyma		Root xylem	
Ψ_P	Ψ_S	Ψ_P	Ψ_S
200	-220	65	-5

d)

Root parenchyma		Root xylem	
Ψ_P	Ψ_S	Ψ_P	Ψ_S
200	-250	-65	-5

140. Match the followings and choose the correct option.

Column I		Column II
A. Leaves	(i)	Anti-transpirant
B Seed	(ii)	Transpiration
C Roots	(iii)	Negative osmotic potential

- a) A-(ii), B-(iv), C-(v), D-(i), E-(iii) b) A-(iii), B-(ii), C-(iv), D-(i), E-(v)
 c) A-(i), B-(ii), C-(iii), D-(iv), E-(v) d) A-(v), B-(iv), C-(iii), D-(ii), E-(i)

141. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: Osmosis is a special type of diffusion of water through a semi-permeable membrane.

Reason: The net direction and rate of osmosis depends only on the pressure gradient.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false.

142. Loss or excretion of water in the form of liquid droplets from the margins and tips of leaves is called

- a) transpiration b) guttation c) bleeding d) precipitation

143. In which of the following pathways, movement of water occurs from one cell to another cell through plasmodesmata?

- a) Apoplast pathway b) Symplast pathway c) Vacuolar pathway
 d) Transmembrane pathway

144. If some solute is dissolved in pure water, its water potential

- a) remains same b) increases c) decreases d) first decreases then increases

145. Osmosis is a special kind of diffusion, through which water diffuses across the cell membrane. The rate and direction of osmosis depends upon

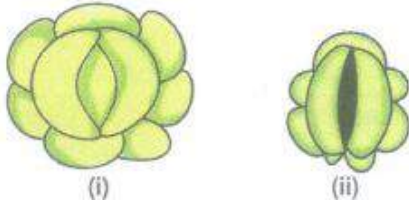
- a) pressure gradient b) concentration gradient c) both (a) and (b) d) none of these.

146. Which of the following statements does not apply to reverse osmosis?

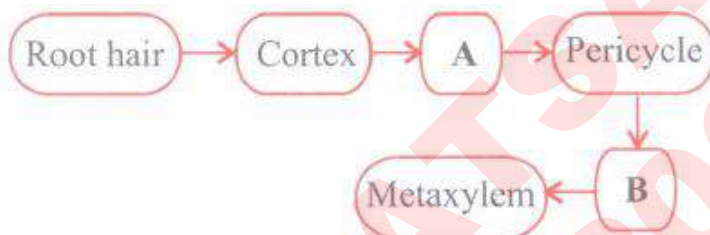
- a) It is used for water purification.
 b) In this technique, pressure greater than osmotic pressure is applied to the system
 c) It is a passive process. d) It is an active process

147. Active transport

- a) uses energy to pump molecules against the concentration gradient
b) is an active process c) is carried out by membrane proteins d) all of these.
148. Amphistomatic leaf, with stomata distributed equally on both the surfaces, is an example of
a) isobilateral leaf b) dorsiventral leaf c) xerophytic leaf d) hydrophytic leaf.
149. Stomata of a plant open due to _____
a) influx of calcium ions b) influx of potassium ions c) efflux of potassium ions
d) influx of hydrogen ions
150. The given figure shows two states of a stomata.



- In which of the conditions (i) and (ii), guard cells will have higher water content?
a) (i) only b) (ii) only c) Equal in both d) No water content in both
151. In the given flow chart, the flow of water is shown from soil to xylem of the root. Identify the tissues involved in steps A and B.



- a) A - Hypodermis; B - Protoxylem b) A - Medullary rays; B - Phloem
c) A - Endodermis; B - Phloem d) A - Endodermis; B - Protoxylem
152. When water enters into a cell what happens to its OP, TP and DPD?
a) OP & TP increase & its DPD increase b) OP & DPD increase & TP decrease
c) TP & DPD decrease & OP increase d) OP & DPD decrease & TP increase
153. Smaller, lipid soluble molecules diffuse faster through cell membrane, but the movement of hydrophilic substances is facilitated by certain transporters which are chemically
a) proteins b) carbohydrates c) lipids d) phospholipids
154. Stomata in angiosperms open and close due to _____
a) their genetic constitution b) effect of hormones
c) change of turgor pressure in guard cells d) pressure of gases inside the leaves
155. The restoration of turgidity in a plasmolysed cell, when placed in a hypotonic solution is caused by
a) hydration b) electrolysis c) plasmolysis d) deplasmolysis
156. Water passes into a cell due to
a) OP b) DPD c) turgor pressure d) diffusion
157. A column of water within xylem vessels of tall trees does not break under its weight because of _____
a) Tensile strength of water b) Lignification of xylem vessels c) Positive root pressure
d) Dissolved sugars in water

158. Read the given statements that refer to different stages of plasmolysis. Select the correct option regarding them.

(i) First stage of plasmolysis, when osmotic concentration of cell sap is just equivalent to that of external solution.

(ii) Protoplast withdraws itself from corners of the cell wall.

(iii) Protoplast gets detached from the cell wall and attains a spherical shape.

a)

(i)	(ii)	(iii)
Incipient plasmolysis	Limiting plasmolysis	Evident plasmolysis

b)

(i)	(ii)	(iii)
Limiting plasmolysis	Incipient plasmolysis	Evident' plasmolysis

c)

(i)	(ii)	(iii)
Limiting plasmolysis	Evident plasmolysis	Incipient plasmolysis

d)

(i)	(ii)	(iii)
Evident plasmolysis	Incipient plasmolysis	Limiting plasmolysis

159. Movement of the molecules of solids, gases or liquids from the region of their higher concentration to the region of their lower concentration is known as

a) diffusion b) osmosis c) imbibition d) active transport.

160. When transport proteins simultaneously move two molecules across a membrane in the same direction, the process is called

a) uniport b) antiport c) symport d) diffusive port.

161. In apoplast pathway, water moves exclusively through the

a) plasmodesmata b) cell walls c) intercellular spaces d) both (b) and (c).

162. Refer to the given table and select the option that correctly fills the blanks in it.

Property	Simple diffusion	Facilitated transport	Active transport
Highly selective	A	Yes	B
Uphill transport	No	C	Yes
Requires ATP	No	D	Yes

a)

A	B	C	D
No	Yes	No	No

b)

A	B	C	D
Yes	Yes	Yes	No

c)

A	B	C	D
No	No	No	Yes

d)

A	B	C	D
No	Yes	Yes	Yes

163. Osmosis means movement of

a) Solute from low concentration to higher b) Solute from higher concentration to low

c) Solvent from low concentration of solution to higher conc. of solution

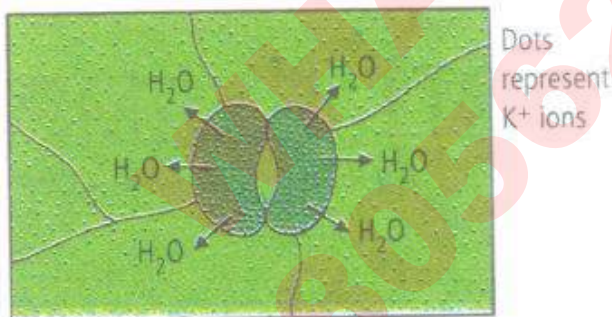
d) Solvent from higher concentration solution to low concentration solution

164. In submerged hydrophytes, the absorption of water takes place through

a) root b) stem c) leaf d) general surface of plant.

165. Mark the mismatched pair.

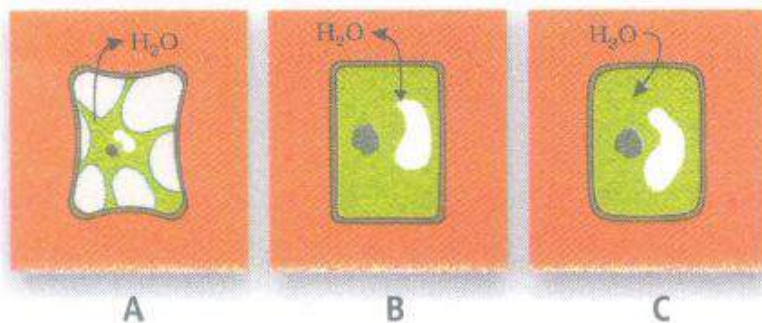
- a) Amyloplast - Store protein granule b) Elaioplast - Store oils or fats
c) Chloroplasts - Contain chlorophyll pigments
d) Chromoplasts - Contain coloured pigments other than chlorophyll
166. Osmotic pressure depends upon
a) Conc. of solutes b) Temperature c) Ionization of solutes d) All of these
167. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: Normally stomata are open in the day time and close during the night.
Reason: The cause of the opening or closing of stomata is the change in the turgidity of the guard cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.
168. Ringing experiment can not be done on a sugar cane plant because
a) Its xylem is scanty b) Its phloem is without phloem parenchyma
c) Its vascular bundles are scattered d) Its phloem is present inside the xylem
169. If a soft stemmed plant is cut horizontally near the base of its stem with a sharp blade on early morning of a humid day, drops of solution ooze through cut stem. This is due to:
a) guttation b) bleeding c) transpiration pull d) root pressure
170. The given diagram illustrates stomatal closing. The major mistake in the diagram is that



- a) the concentration of the K^+ should be more outside the guard cells
b) the concentration of the K^+ should be equal on both inside and outside
c) the peripheral walls of the guard cells should be thicker
d) the water should move inside the guard cells
171. If Ψ_W = water potential; Ψ_S = solute potential; Ψ_P = pressure potential, then select the correct equation showing their inter-relation.
a) $\Psi_W = \Psi_S - \Psi_P$ b) $\Psi_W = \Psi_S + \Psi_P$ c) $\Psi_S = \Psi_W + \Psi_P$ d) $\Psi_W = \Psi_S = \Psi_P$
172. When a plant cell is placed in a hypotonic solution, which of the following will not apply?
a) Wall pressure is decreased b) The cell becomes turgid
c) Suction pressure of the cell sap will decrease
d) Water potential of the cell sap will increase
173. If the molar concentration of the given sugar solution is 0.3M, find out the osmotic pressure of this solution

- a) 6.72 atm b) 67.2 atm c) 2.24 atm d) 5.60 atm
174. A flowering plant is planted in an earthen pot and irrigated. Urea is added in high amounts to make the plant grow faster, but after some time the plant died. This may be due to _____.
- a) exosmosis b) endosmosis c) water logging d) suffocation
175. Which one gives the most valid and recent explanation for stomatal movements?
- a) Potassium influx and efflux b) Starch hydrolysis c) Guard cell photosynthesis
d) Transpiration
176. The 96% of water absorption in plants is due to
- a) Passive absorption b) Active absorption c) Symplastic pathway
d) Mostly active sometimes passive
177. Stomatal movement is not affected by :
- a) O₂ concentration b) light c) Temperature d) CO₂ concentration
178. Basis of stomatal opening is _____
- a) exosmosis b) endosmosis c) decrease in cell sap concentration
d) plasmolysis of guard cells
179. Passive absorption of water from the soil by the root is mainly effected by
- a) Typical tissue organisation b) Respiratory activity of root
c) Tension on cell sap due to transpiration d) None of the above
180. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** In symport method, both molecules cross the membrane in the same direction at the same time.
- Reason:** In antiport method, both molecules move in opposite direction.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.

181. Refer to the given figure and identify cells A, B and C.



- a) A - Plasmolysed; B - Flaccid; C - Turgid b) A - Flaccid; B - Turgid; C - Plasmolysed
c) A - Turgid; B - Plasmolysed; C - Flaccid d) A - Turgid; B - Flaccid; C - Plasmolysed
182. Xylem translocates _____
- a) Water and mineral salts only b) Water, mineral salts and some organic nitrogen only
c) Water, mineral salts, some organic nitrogen and hormones d) Water only

183. Conversion of starch to organic acid is essential for ____
a) stomatal closure b) stomatal opening c) stomatal initiation d) stomatal growth
184. Choose the correct option Mycorrhiza is a symbiotic association of fungus with root system which helps in
A. absorption of water
B. mineral nutrition
C. translocation
D. gaseous exchange
a) Only A b) Only B c) Both A and d) Both B and C
185. The process of diffusion is involved in:
a) respiration b) photosynthesis c) transpiration d) all of these.
186. The cell A has an osmotic potential of -20 bars and a pressure potential of + 6 bars. What will be its water potential?
a) - 20 bars b) - 26 bars c) - 14 bars d) + 14 bars
187. Select the option which correctly satisfies the same relationship.
Stomata: Transpiration: : Hydathode : ____
a) Guttation b) Root pressure c) Bleeding d) Oozing
188. Water entering root due to diffusion is part of ____
a) endosmosis b) osmosis c) passive absorption d) active absorption
189. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: Ions are absorbed from the soil by active transport only.
Reason: The proteins present in the membranes of root hair cells passively pump ions from the soil into the cytoplasm of the epidermal cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
190. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: Cohesion, adhesion and surface tension give high tensile strength to water.
Reason: Capillarity is aided by small diameter of the tracheary elements.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.
191. If DPD represents diffusion pressure deficit, OP is the osmotic pressure and TP is the turgor pressure, then which of the following equations is correct?
a) $DPD = OP = TP$ b) $DPD = OP + TP$ c) $DPD = OP - TP$ d) $DPD = OP$
192. Stomatal movements are influenced by a number of environmental factors. Which of the following statements is/are incorrect regarding this?
(i) Blue light keeps stomata open during the day promoting the movement of K^+ ions into guard

cells.

(ii) Increased CO_2 concentration reduces the pH of guard cells which promotes conversion of sugar into starch, ultimately causing closure of stomata.

(iii) Abscissic acid, under stress conditions, causes rapid movement of K^+ ions into guard cells.

(iv) Highly concentrated sucrose or salt solution when applied over to stomata, results in stomatal opening.

a) (i) and (ii) b) (iii) and (iv) c) (iii) only d) (iv) only

193. The process of guttation takes place

a) when the root pressure is high and the rate of transpiration is low

b) when the root pressure is low and the rate of transpiration is high

c) when the root pressure equals the rate of transpiration

d) when the root pressure as well as rate of transpiration are high.

194. Read the following statements and select the correct option.

(i) Pure water has the highest water potential, i.e., zero.

(ii) Process of diffusion does not require any input of energy.

(iii) Water moves from the system containing water at higher water potential to the one having lower water potential.

a) Statements (i) and (ii) are correct. b) Statements (ii) and (iii) are correct.

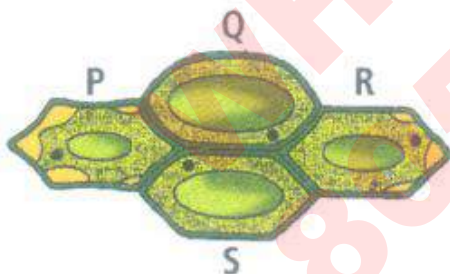
c) Statements (i) and (iii) are correct. d) Statements (i), (ii) and (iii) are correct

195. Potometer works on the principle of _____

a) osmotic pressure b) amount of water absorbed equals the amount transpired

c) root pressure d) potential difference between the tip of the tube and that of the plant

196. Which out of the four plant cells (P, Q, R and S) would not exhibit any wall pressure?



a) P and Q b) Q and S c) P and R d) R and S

197. Which of the following criterion does not pertain to facilitated transport?

a) High selectivity b) Transport saturation c) Uphill transport

d) requirement of special membrane

198. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: The direction of movement of organic solutes in the phloem is bi-directional.

Reason: The transportation depends on variability of source-sink relationship.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false.

199. Read the given statements and select the correct option.

Statement 1: Plasmolysis is bursting of cell membrane when a cell is kept in a hypertonic solution.

Statement 2: Hypertonic solution causes endosmosis.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

200. Guttation is the result of:

- a) Osmosis b) Root pressure c) Diffusion d) Transpiration

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RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

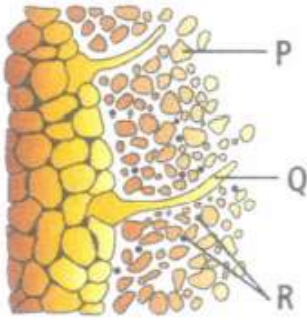
MINERAL NUTRITION 1

Marks : 800

- One example of a nutrient in its reduced form is
a) carbon in CO_2 b) hydrogen in H_2O c) nitrogen in NH_3 d) sulphur in sulphate
- In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as:
Assertion: Reduction of nitrogen to ammonia by living organisms is called nitrification.
Reason: Example of free-living nitrogen fixing anaerobic microbes are Azotobacter and Beijerinckia
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
- While in N, K and Mg deficiency, chlorosis appears first in _____ leaves; in Sand Ca deficiency, _____ leaves are the first to be affected.
a) young, old b) old, young c) old, old d) young, young
- Which is essential for the growth of root tip?
a) Fe b) Ca c) Mn d) Zn
- Arrange the following elements in order of their abundance in human body:
a) $\text{Na} > \text{K} > \text{Fe} > \text{Cu}$ b) $\text{Na} \approx \text{K} > \text{Fe} > \text{Cu}$ c) $\text{K} > \text{Na} > \text{Cu} > \text{Fe}$
d) $\text{Cu} > \text{Fe} > \text{Na} > \text{K}$
- Deficiency symptoms of readily mobilised essential elements will first appear in _____
a) younger tissues b) older tissues c) roots d) shoots
- Which of the following is not a deficiency symptom of minerals?
a) Internode shortening b) Necrosis c) Chlorosis d) Etiolation
- Which of the following is a non-symbiotic nitrogen fixing prokaryote?
a) Azotobacter b) Clostridium c) Beijerinckia d) All of these
- Which of the following minerals activate the enzymes involved in respiration?
a) Nitrogen and phosphorus b) Magnesium and manganese
c) Potassium and calcium d) Sulphur and iron

10. Which one of the following is a free-living obligate anaerobic bacterium?
a) Clostridium b) Rhodospirillum c) Azotobacter d) Bacillus subtilis
11. Which one of the following is wrong Statement?
a) Anabaena and Nostoc are capable of fixing nitrogen in free living state also.
b) Root nodule forming nitrogen fixers live as aerobes under free-living conditions.
c)
Phosphorus is a constituent of cell membranes. certain nucleic acids and cell proteins.
d) Nitrosomonas and Nitrobacter are chemoautotrophs
12. Mineral salts are translocated through Jil along with the IliL stream of water, which is pulled up through the plant by transpirational pull. Fill up the blanks in the given statement and select the Correct option.
- | | | | |
|-----------------|------------------|------------------|-------------------|
| a) | b) | c) | d) |
| (i) (ii) | (i) (ii) | (i) (ii) | (i) (ii) |
| xylem ascending | xylem descending | phloem ascending | phloem descending |
13. Select the option that contains micronutrients only.
a) Mn, Mo, Zn b) C, H, N c) N, P, O d) Mn, K, S
14. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Some essential elements are called structural elements of cells.
Reason: These essential elements are the components of certain biomolecules
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false d) If both assertion and reason are false
15. Select the incorrectly matched pair.
a) Magnesium (Mg) - Formation of mitotic spindle
b) Iron (Fe)- Formation of chlorophyll c) Chlorine (Cl) - Anion-cation balance in the cell
d) Sulphur (S) - Component of vitamins
16. During biological nitrogen fixation, inactivation of nitrogenase by oxygen poisoning is prevented by
a) Cytochrome b) Leghaemoglobin c) Xanthophyll d) Carotene
17. In which of the following all three are macronutrients ?
a) Boron, Zinc, Manganese b) Iron, Copper, molybdenum
c) Molybdenum, magnesium, manganese d) Nitrogen, nickel, phosphorus
18. The process of transfer of amino group from one amino acid to the keto group of a keto acid is called as _____
a) oxidative amination b) reductive amination c) transamination d) deamination

19. The amino acid which plays a central role in nitrogen metabolism is/are
 a) Glutamic acid b) α -ketoglutaric acid c) Aspartic acid d) Oxaloacetic acid
20. Refer to the given figure and select the correct option.



a)

P	Q	R
Soil particles	Root hair	Bacteria

b)

P	Q	R
Bacteria	Hook	Soil particle

c)

P	Q	R
Nodule	Infection thread	Bacteria

d)

P	Q	R
Bacteria	Infection thread	Root hair

21. Which one of the following statements can best explain the term critical concentration of an essential element?
- Essential element concentration below which plant growth is retarded
 - Essential element concentration below which plant growth becomes enhanced
 - Essential element concentration below which plant remains in the vegetative phase
 - None of the above
22. Read the given statements and select the correct option.
- Statement 1:** Soil serves as a reservoir of essential elements.
- Statement 2:** Soil develops, over the years, through physical and chemical weathering of rocks.
- Both statements 1 and 2 are correct.
 - Statement 1 is correct but statement 2 is incorrect.
 - Statement 1 is incorrect but statement 2 is correct
 - Both statements 1 and 2 are incorrect.
23. The major role of minor elements inside living organisms is to act as _____
- binder of cell structure
 - co-factors of enzymes
 - building blocks of important amino acids
 - constituent of hormones
24. A plant requires magnesium for _____
- protein synthesis
 - chlorophyll synthesis
 - cell wall development
 - holding cells together
25. Which elements are considered as balancing elements?
- Ca & K
 - C & H
 - N & S
 - Mg and Fe

26. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: As per carbonic acid exchange theory of mineral salt absorption, CO_2 released during respiration of roots forms H_2CO_3 when dissolved in soil water.

Reason: H_2CO_3 dissociates into H^+ and HCO_3^- ions, where H^+ ions exchange with anions adsorbed on clay particles.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

27. Which of the following set represents micronutrients?

a) B, Ni, Mo, Mn, Fe b) B, N, Mo, Mn, P c) S, Ca, B, Mo, Fe d) N, Mo, Mn, K, Mg

28. Which element is required in comparatively least quantity for the growth of plant?

a) Zn b) N c) P d) Ca

29. Which of the following are macronutrients?

a) Carbon, nitrogen b) Oxygen, phosphorus c) Potassium, sulphur d) All of these

30. Which of the following plant with nodules containing filamentous nitrogen - fixing microorganism?

a) *Cicer arietinum* b) *Cesuerltie equisetifolia* c) *Cratalaria juncea* d) *Cycas revoluta*

31. Which one of the following is the incorrect statement?

a) Phosphorus is a constituent of cell membranes, certain nucleic acids and all proteins

b) *Nitrosomonas* and *Nitrobacter* are chemoautotrophs

c) *Anabaena* and *Nostoc* are capable of fixing nitrogen in free-living state also

d) Root nodule forming nitrogen fixers live as aerobes under free-living conditions

32. Plants can be grown in (Tick the incorrect option)

a) soil with essential nutrients b) water with essential nutrients

c) either water or soil with essential nutrients

d) water or soil without essential nutrients

33. Which one is the major constituent of proteins, nucleic acids, vitamins and hormones?

a) P b) N c) K d) S

34. Following observations are made for a plant grown under different conditions.

I. Chloride and magnesium in soil + light \rightarrow green plant

II. Chloride and magnesium in soil + dark \rightarrow etiolated plant

III. Magnesium + light \rightarrow green plant

IV. Intermittent light flashes + chloride \rightarrow etiolated plant

From the above observations, it is concluded that the factors necessary for the green colour in plants are

- a) chloride and light b) chloride, magnesium and light c) magnesium and light
d) flash of light with chloride.
35. The macronutrient _____ is a component of all organic compounds but is not obtained from soil.
a) carbon b) hydrogen c) oxygen d) nitrogen
36. During N_2 fixation, reduction of one molecule of nitrogen into 2 molecules of NH_3 consumes _____ molecules of ATP.
a) 4 b) 16 c) 56 d) 38
37. Leguminous plants are able to fix atmospheric nitrogen through the process of symbiotic nitrogen fixation. Which one of the following statement is not correct during this process of nitrogen fixation?
a) Nodules act as sites for nitrogen fixation
b) The enzyme nitrogenase catalyses the conversion of atmospheric N_2 to NH_3
c) Nitrogenase is insensitive to oxygen
d) Leghaemoglobin scavenges oxygen and is pinkish in colour
38. Necrosis refers to
a) inhibition of cell division b) delay in flowering c) death of tissues
d) falling of leaves
39. Which one of the following is essential for photolysis of water?
a) Boron b) Manganese c) Zinc d) Copper
40. Which of the following is not caused by deficiency of mineral nutrition?
a) Necrosis b) Chlorosis c) Etiolation d) Shortening of internodes
41. Brown heart rot of beets is due to deficiency of:
a) B b) P c) Mg d) Mo
42. The first stable product of fixation of atmospheric nitrogen in leguminous plants is _____
a) Ammonia b) NO_3 c) Glutamate d) NO_2
43. One of the free-living, anaerobic nitrogen - fixer is _____
a) Beijerinckia b) Rhodospirillum c) Rhizobium d) Azotobacter
44. Nitrite is oxidised to nitrate with the help of
a) Nitrosomonas b) Nitrococcus c) Nitrobacter d) Thiobacillus
45. Which of the following element is responsible for maintaining turgor in cells:
a) Potassium b) Sodium c) Magnesium d) Calcium
46. Which element essential for stability of chromosome structure?
a) Zn b) Ca c) Mo d) Fe
47. Which of the following statements is incorrect about leghaemoglobin?
a) It acts as O_2 scavenger b) It imparts pink or red colour to the nodules
c) It combines with O_2 and protects nitrogenase d) It is a Mo-Fe protein

48. During nodule formation in leguminous plants, an infection thread is produced carrying the _____(i)_____ into the _____(ii)_____ of the root, where they initiate the nodule formation in the _____(iii)_____ of the root. Fill up the blanks by choosing the correct option.

a)

(i)	(ii)	(iii)
cyanobacteria	pericycle	cortex

b)

(i)	(ii)	(iii)
bacteria	cortex	cortex

c)

(i)	(ii)	(iii)
cyanobacteria	cortex	pericycle

d)

(i)	(ii)	(iii)
bacteria	pericycle	pericycle

49. Minerals absorbed by roots move to the leaf through _____

- a) xylem b) phloem c) sieve tubes d) None of these

50. Which one is the correct summary equation of nitrogen fixation?

- a) $N_2 + 8e^- + 8H^+ + 8ATP \rightarrow NH_3 + H_2 + 16ADP + 16P_i$
 b) $N_2 + 8e^- + 8H^+ + 16ATP \rightarrow 2NH_3 + H_2 + 16ADP + 16P_i$
 c) $2NH_3 + 4O_2 \rightarrow 2H^+ + 2H_2O + 2NO_3^-$ d) $2NH_3 + 3O_2 \rightarrow 2NO_2^- + 2H^+ + 2N_2O$

51. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as:

Assertion: Reductive amination involves the transfer of amino group from one amino acid to the keto group of a keto acid.

Reason: In reductive amination, transfer of NH_2 from glutamic acid takes place

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

52. A. Macronutrients are present in plant tissues in excess of 10 mmole kg^{-1} of dry matter.

B. C, H and O are obtained mainly from carbondioxide and water and others are absorbed from soil.

- a) Only A is correct b) Only B is correct c) Both A and B are correct
 d) Both A and B are incorrect

53. Which of the group of elements is not essential for a normal plant?

- a) K, Ca, Mg b) Fe, Zn, Mn, B c) Pb, I, Na d) Mg, Fe, Mo

54. Which of the following is not a micronutrient:

- a) Boron b) Molybdenum c) Magnesium d) Zinc

55. A free living nitrogen-fixing" cyanobacterium which can also form symbiotic association with the water fern Azolla is _____

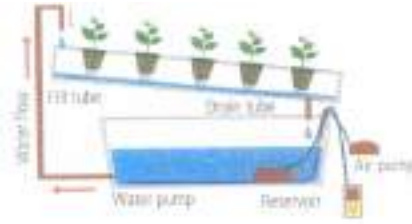
- a) Tolypothrix b) Chlorella c) Nostoc d) Anabaena

56. You observe that a plant's younger leaves, not the older ones, are yellowing. You recall that the cause of plant sickness can be diagnosed by which leaves are yellowing. What is the most likely cause of your plant's blight?
- a) Too much shade b) Lack of nitrogen-fixing Rhizobium bacteria
c) A deficiency in a mobile mineral nutrient
d) A deficiency in a non-mobile mineral nutrient
57. Nitrifying bacteria ____
- a) oxidise ammonia to nitrates b) convert free nitrogen to nitrogen compounds
c) convert proteins into ammonia d) reduce nitrates to free nitrogen
58. All N_2 fixers belong to
- a) Eubacteria b) Algae c) Plantae d) Protista
59. Which of the following statements about mineral absorption in plants is correct?
- a)
In the initial phase rapid uptake of ions into the outer space of cells - the apoplast, is a passive process.
- b)
In the final phase, ions are taken in slowly into the inner space - the symplast of cells, and is an active process.
- c)
Passive movement of ions into the apoplast occurs through ion-channels, transmembrane proteins which act as selective pores.
- d) All of these
60. Amides are different from amino acids as they contain more
- a) hydrogen b) oxygen c) nitrogen d) carbon
61. The technique of growing plants in a nutrient solution, in complete absence of soil is called as
- a) aeroponics b) water culture c) hydroponics d) soil culture.
62. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
- Assertion:** The movement of ions into or out of the cells is usually called flux.
Reason: The entry or exit of ions to and from the symplast, is an active process.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false d) If both assertion and reason are false
63. The largest reservoir of nitrogen on Earth is
- a) soil b) air c) oceans d) rocks

64. From _____ acid, more than 17 amino acids are formed through transamination.
a) aspartic b) glutamic c) acetic d) pyruvic
65. The function of leg haemoglobin in the root nodules of legumes is _____
a) inhibition of nitrogenase activity b) oxygen removal c) nodule differentiation
d) expression of nif gene
66. Deficiency symptom of nitrogen and potassium are visible first in:
a) Buds b) Roots c) Senescent leaves d) Young leaves
67. According to carbonic acid exchange theory of mineral salt absorption by roots, which of the following is incorrect?
a) H^+ ions may be exchanged for cations adsorbed on clay particles.
b)
Cations thus released into soil solution are adsorbed on root cells in exchange for anions (e.g., Cl^- ions),
c) CO_2 released by the respiration of roots combines with soil H_2O to form H_2CO_3
d) H_2CO_3 dissociates into H^+ and HCO_3^- ions in soil solution
68. The group of mineral nutrients known as frame work elements:
a) N, S, P b) C, H, O c) Mg, Fe, Zn d) Zn, Mn, Cu
69. Phosphorus (P) is a structural element of
a) cell membranes b) proteins c) nucleic acids d) all of these
70. Which of the following set contains macro nutrients?
a) P, N, K and Mg b) K, Mn, Fe and Co c) P, Fe, Mn and K d) Fe, Co, Si and N
71. Which of the four most abundant elements in most plants (C, H, O and N), does a terrestrial green plant procure mainly through its roots from the soil?
a) H and O b) H and N c) C and O d) O and N
72. In which of the following forms is iron absorbed by plants?
a) Free element b) Ferrous c) Ferric d) Both Ferric and Ferrous
73. Select the correctly matched pair
a) Zinc - Helps to maintain the ribosome structure
b) Magnesium - Needed during the formation of mitotic spindle
c) Calcium - Plays a role in the opening and closing of stomata
d)
Manganese - Needed in the splitting of water to liberate oxygen during photosynthesis
74. Premature leaf fall is due to deficiency of
a) sodium b) potassium c) zinc d) phosphorus
75. Which of the following is a symbiotic nitrogen fixer?
a) Azotobacter b) Frankia c) Azolla N d) Glomus
76. The disease related with deficiency of molybdenum is;

- a) Whiptail disease of cauliflower b) Little leaf disease
c) Reclamation disease of cereals d) Brown heart disease

77. Identify the given type of hydroponic technique and select the correct option.



- a)
A very shallow stream of water containing dissolved nutrients is recirculated past the roots of plants in a watertight channel
- b)
The nutrient solution flows in a thin film over the roots ensuring that the upper part of the roots gets sufficient supply of oxygen
- c)
Roots keep suspended in the air over the nutrient solution which is provided in the form of a nutrient mist.
- d) Both (a) and (b)
78. Which one of the following is not an essential minerals element for plants while the remaining three are?
a) Iron b) Manganese c) Cadmium d) Phosphorus
79. Which one of the following elements in plants is not remobilised?
a) Phosphorus b) Calcium c) Potassium d) Sulphur
80. Which aquatic fern performs nitrogen fixation?
a) Azolla b) Nostoc c) Salvia d) Salvinia
81. Deficiency symptoms of nitrogen and potassium are visible first in_____
a) Senescent leaves b) young leaves c) Roots d) Buds
82. The non-mineral elements are:
a) C, H, O b) N, Ca, Mg c) Fe, Co, Mn d) Cu, Mo, N.
83. The most abundant element present in the plants is_____
a) Carbon b) Nitrogen c) Manganese d) Iron
84. Select the mismatch
a) Frankia - Alnus b) Rhodospirillum - Mycorrhiza c) Anabaena - Nitrogen Fixer
d) Rhizobium -Alfalafa
85. The core metal of chlorophyll is_____
a) iron b) magnesium c) nickel d) copper
86. Which of the following is not one of the three plant macronutrients included in most fertilisers?
a) O b) N c) P d) K

87. Decomposition of organic nitrogen of dead plants and animals into ammonia is called _____
a) nitrification b) nitrate reduction c) N_2 -fixation d) ammonification
88. Mineral ion concentration in tissues that reduces the dry weight of tissues by about 10% is considered as:
a) critical concentration b) toxic concentration c) optimum concentration
d) beneficial concentration.
89. The bacterium ___ belonging to group Actinomycetes, produces N_2 -fixing nodules on the roots of nonleguminous plants (e.g. Alnus).
a) Frankia b) Rhizobium c) Rhodospirillum d) Clostridium
90. Conversion of $NO_3^- \rightarrow NO_2^- \rightarrow NH_4$ is called _____ and is catalysed by _____
a) Nitrate assimilation, nitrate and nitrite reductase
b) Nitrification, nitrate and nitrite reductase
c) Ammonification, glutamate dehydrogenase d) Denitrification, transaminase
91. Protoplasmic elements are:
a) C, H, O, P, N, S b) C, H, O, Fe, N c) N, S, Fe, P, K d) Fe, Mg, Ca, N, P
92. Monovalents (e.g., Na^+ , K^+) _____ membrane permeability while divalents (e.g., Ca^{2+}) _____ the same
a) increase, decrease b) decrease, increase c) increase, increase
d) decrease, decrease
93. Symbiotic bacteria are found in the root nodules of members of Family
a) Solanaceae b) Asteraceae c) Leguminosae d) Malvaceae
94. Leghaemoglobin is produced in response to
a) respiration b) fatty acid oxidation c) photosynthesis d) N_2 -fixation.
95. The amino acid having S in its composition is-
a) Cystine b) Cysteine c) Methionine d) All
96. Passive absorption of minerals depend on _____
a) temperature b) temperature and metabolic inhibitor c) metabolic inhibitor
d) humidity
97. The technique of hydroponics is being employed for the commercial production of vegetables like
a) tomato b) cucumber c) lettuce d) all of these.
98. The two elements responsible for splitting of H_2O to liberate O_2 during photosynthesis are
a) Mn and Mo b) Ca and Mg c) Mn and Cl d) Mg and Cl
99. Chlorosis, i.e., loss of chlorophyll leading to yellowing in leaves, is caused by the deficiency of:

- a) N, K, Mg b) S, Fe, Zn c) Mn, Mo, Mg d) all of these
100. Mineral nutrients absorbed by roots, move to leaves through
a) xylem b) phloem c) sieve tube d) companion cell
101. Hydroponics or soilless culture helps in knowing:
a) essentiality of an element b) deficiency symptoms caused by an element
c) toxicity caused by an element d) all of these.
102. In the following questions, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
- Assertion:** Nitrate present in the soil is reduced to nitrogen by the process of denitrification.
Reason: Denitrification is carried by bacteria *Pseudomonas* and *Azotobacter*.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false d) If both assertion and reason are false
103. Match the following concerning essential elements and their functions in plants:
- | Column - I | Column - II |
|--------------|---|
| A. iron | (i) photolysis of water |
| B. Zinc | (ii) pollen germination |
| C. Boron | (iii) Required for chlorophyll biosynthesis |
| D. Manganese | (iv) IAA biosynthesis |
- Select the correct option _____ .
- a) (iii) (iv) (ii) (i) b) (iv) (i) (ii) (iii) c) (ii) (i) (iv) (iii) d) (iv) (iii) (ii) (i)
104. Which one of the following essential elements plays an important role in opening and closing of stomata?
a) Mg b) K c) Mn d) P
105. Amides are transported to the other parts of the plant via
a) phloem parenchyma b) phloem companion cells c) xylem vessels
d) phloem fibre
106. Phosphorus and nitrogen ions generally get depleted in soil because they usually occur as _____
a) neutral ions b) negatively charged ions c) positively charged ions
d) both positively and negatively charged but disproportionate mixture

107. Hydroponics is a technique in which plants are grown in?

- a) Green house b) Water saturated sand c) Balanced nutrient solution
d) Purified distilled water

108. Nitrogen is a limiting nutrient for

- a) natural ecosystem b) aquatic ecosystem c) agricultural ecosystem
d) both (a) and (c)

109. Some functions of a nutrient element are given below

- (i) Important constituent of proteins involved in ETS
(ii) Activator of catalase
(iii) Important constituent of cytochrome
(iv) Essential for chlorophyll synthesis

The concerned nutrient is _____ .

- a) Cu b) Fe c) Ca d) Mo

110. Match the element with its associated functions/roles and choose the correct option among given below

A. Boron	(i)	Splitting of H_2O to liberate O_2 during photosynthesis
B.	(ii)	Needed for synthesis of auxins
C.	(iii)	Component of nitrogenase
D.	(iv)	Pollen germination
E.	(v)	Component of ferredoxin

- a) A-(i), B-(ii), C-(iii), D-(iv), E-(v) b) A-(iv), B-(i), C-(iii), D-(ii), E-(v)
c) A-(iii), B-(ii), C-(iv), D-(v), E-(i) d) A-(ii), B-(iii), C-(v), D-(i), E-(iv)

111. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: The technique of growing plants in a nutrient solution is known as hydroponics.

Reason: Hydroponics is used for commercial production of vegetables such as tomato, seedless cucumber and lettuce.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false.

112. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Nitrosomonas, Nitrosococcus	(i) Ammonia to nitrite
B. Nitrobacter, Nitrocystis	(ii) Nitrite to nitrate
C. Pseudomonas, Thiobacillus	(iii) Nitrate to N_2

- a) A-(i), B-(ii), C-(iii) b) A-(i), B-(iii), C-(ii) c) A-(ii), B-(i), C-(iii) d) A-(ii), B-(iii), C-(i)

113. Match column I with column II and select the correct option from the codes given below

Column I (Activator element)	Column II (Enzyme)
A. Mg^{2+}	(i) Nitrate reductase
B. Zn^{2+}	(ii) RuBisCO, PEPCase
C. Mo	(iii) Alcohol dehydrogenase

- a) A-(ii), B-(iii), (C)-(i) b) A-(iii), B-(ii), (C)-(i) c) A-(i), B-(iii), (C)-(ii)
d) A-(ii), B-(i), (C)-(iii)

114. The process of conversion of atmospheric free N_2 gas to nitrogenous compounds like NH_3 is termed as

- a) nitrification b) nitrate reduction c) N_2 fixation d) ammonification

115. Minerals are absorbed in the form of

- a) molecules b) ions c) compounds d) mixtures

116. The inorganic essential elements which are obtained from the soil are called as:

- a) mineral elements b) non-mineral elements c) non-essential elements
d) both (b) and (c).

117. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: Necrosis occurs due to deficiency of Ca, Mg, Cu and K.

Reason: Necrosis is the death of tissue, particularly leaf tissue.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false.

118. Which one of the following elements is not an essential micronutrient for plant growth?

- a) Zn b) Cu c) Ca d) Mn

119. Nodules in soybean plant export the fixed nitrogen in the form of

- a) ureides b) amides c) amino acids d) both (b) and (c).

120. An organism used as a biofertilizer for raising soyabean crop is:

- a) Azotobacter b) Azospirillum c) Rhizobium d) Nostoc

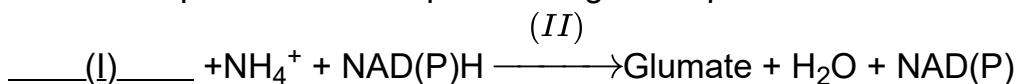
121. Minerals known to be required in large amounts for plant growth include _____.

- a) calcium, magnesium, manganese. copper
b) potassium, phosphorus, selenium, boron c) magnesium, sulphur, iron. zinc
d) phosphorus, potassium, sulphur, calcium

122. A farmer adds Azotobacter culture to soil before sowing maize. Which mineral element will be replenished by doing so?
a) N b) P c) K d) S
123. The common nitrogen fixer in paddy fields is
a) Frankia b) Rhizobium c) Azospirillum d) Oscillatoria
124. Minerals which maintain cation-anion balance in cells are
a) Cl and K b) K and Fe c) Cl and Mg d) Ca and Mg
125. Deficiency of which of the following elements delay flowering in plants?
a) Fe, Mn, Mo b) N, S, Mo c) Ca, Mg, K d) N, K, S
126. Nitrogen and hydrogen combine to form ammonia under high temperature and pressure conditions. This is an example of
a) biological N_2 fixation b) natural N_2 fixation c) industrial N_2 fixation
d) electrical N_2 fixation
127. The product(s) of reaction catalyzed by nitrogenase in root nodules of leguminous plant is / are _____
a) Ammonia and oxygen b) Ammonia and hydrogen c) Ammonia alone
d) Nitrate alone
128. Certain non-leguminous plants also form nodules to fix N_2 . Example of such plants is
a) Alnus b) Casuarina c) Myrica d) all of these.
129. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Sulphur is the main constituent of several coenzymes, vitamins and ferredoxin.
Reason: Sulphur is present in two amino acids - valine and cysteine
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
130. Deficiency symptoms of an element tend to appear first in young leaves. It indicates that the element is relatively immobile. Which one of the following elemental deficiency would show such symptoms?
a) Sulphur b) Magnesium c) Nitrogen d) Potassium
131. Which of the following elements are required for chlorophyll synthesis?
a) Fe and Mg b) Mo and Ca c) Cu and Ca d) Ca and K
132. For its activity, nitrogenase requires:
a) Light b) Manganese c) Super oxygen radicals d) High input of energy

133. Which is a criteria for essentiality of a mineral element?
a) Direct role in metabolism b) Requirement is specific
c) Deficiency causes hunger signs d) More than one option is correct
134. Minerals associated with redox reactions are:
a) Na, Cu b) N, Cu c) Fe, Cu d) Ca, Fe
135. Manganese is required in :
a) Plant cell wall formation b) Photolysis of water during photosynthesis
c) Chlorophyll synthesis d) Nucleic acid synthesis
136. The cofactor of nitrate reductase is.
a) Cu b) Zn c) Ca d) Mo
137. With regard to the Biological Nitrogen Fixation by Rhizobium in association with soybean, which one of the following statement/statements does not hold true?
a) Nitrogenase may require oxygen for its functioning. b) Nitrogenase is Mo-Fe protein
c) Leghaemoglobin is a pink coloured pigment.
d) Nitrogenase helps to convert N_2 gas into two molecules of ammonia
138. Necrosis mainly occurs by the deficiency of
a) Ca, Mg b) N, S c) Mn, Mo d) Fe, Mn
139. More than _____ elements of the _____ discovered so far are found in different plants.
a) 60, 105 b) 105, 60 c) 30, 60 d) 4, 105
140. Which of the following helps in pollen germination, membrane functioning and cell differentiation?
a) B b) Mn c) Ni d) S
141. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: The enzyme nitrogenase is a Mo-Fe protein and catalyses the conversion of atmospheric nitrogen to ammonia.
Reason: The enzyme nitrogenase is highly sensitive to the molecular oxygen.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.
142. The nodules present in the leguminous plants appear pink in colour due to the presence of
a) RBCs b) leg haemoglobin c) nitrogenase enzyme d) bacterial secretion
143. In plants inulin and raphides_____

- a) reserved food material b) wastes c) secretory material
d) insect attracting material
144. Sulphur is a constituent of which of the following amino acids?
a) Threonine b) Cysteine c) Methionine d) Both (b) and (c)
145. A prokaryotic autotrophic nitrogen fixing symbiont is found in____
a) Alnus b) Cycas c) Cicer d) pisum
146. The element which can not be placed along with micronutrients:
a) Mn b) Mo c) Cu d) Ca
147. Read the following statements and select the correct answer.
(i) Rhizobium leguminosarum is also known as Bacillus radicicola.
(ii) Nitrifying bacteria (Nitrosomonas, etc.) are chemoautotrophs.
(iii) Enzyme nitrogenase fixes N_2 under aerobic conditions.
(iv) Leghaemoglobin creates aerobic conditions for the enzyme nitrogenase.
a) Statements (i), (ii) and (iii) are correct b) Statements (i) and (ii) are correct
c) Statements (iii) and (iv) are correct d) All statements are correct.
148. The limiting factor in nitrogen fixation of soil is
a) soil nature (pH) b) light c) temperature d) air
149. N_2 -fixing blue-green alga Anabaena which is extensively used in rice cultivation, forms symbiotic association with:
a) Cycas roots b) Azolla c) Anthoceros d) Alnus
150. Yellowish edges appear in leaves deficient in
a) potassium b) calcium c) magnesium d) phosphorus
151. If by radiation all nitrogenase enzyme is inactivated, then there will be no
a) fixation of nitrogen in legumes b) conversion of nitrate into nitrogen
c) conversion from nitrate to nitrite in legumes
d) conversion from ammonium to nitrate in soil
152. Select the option which completes the given equation for reductive amination



a)

(I)	(II)
α -ketoglutaric acid	Transaminase

b)

(i)	(ii)
α -ketoglutaric acid	Glutamate dehydrogenase

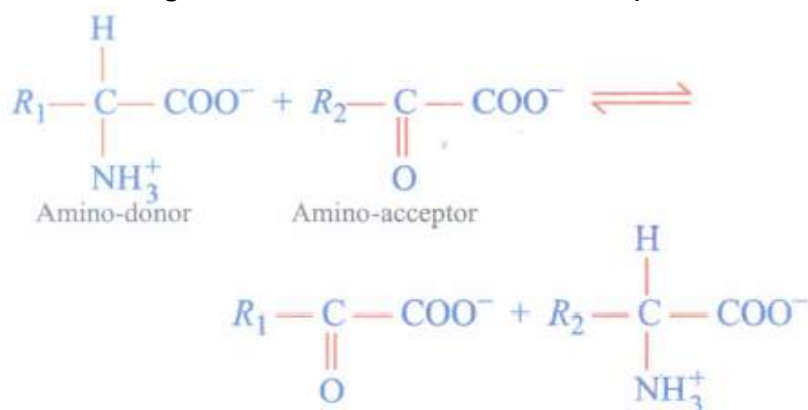
c)

(I)	(II)
Asparagine	Glutamate dehydrogenase

d)

(I)	(II)
Glutamine	Transaminase

153. Refer to the given reaction. What does it depict?



- a) Oxidative amination b) Reductive amination c) Transamination d) Deamination
154. Enzyme involved in nitrogen assimilation _____
 a) nitrogenase b) nitrate reductase c) transferase d) transaminase
155. For chlorophyll formation a plant needs:
 a) Fe, Ca & light b) Fe, Mg & Light c) Ca, K & light d) Mn & Cu
156. Which of the following statements will not hold true if a plant is grown in only sand (S), only clay (C) and only humus (H)?
 a) Water availability to the roots will be more in (C) and (H) as compared to (S).
 b) Ability of roots to penetrate (S) and (H) will be low as compared to (C).
 c) Nutrient availability to roots will be less in (S) as compared to (C) and (H).
 d) Oxygen availability to roots will be low in (C) as compared to (S) and (H).
157. Which one of the following is a micronutrient for plants?
 a) Calcium b) Magnesium c) Manganese d) Nitrogen
158. Which of the following can fix atmospheric nitrogen?
 a) Albugo b) Cystopus c) Saprolegnia d) Anabaena
159. _____ is a free-living N₂-fixing aerobic bacterium.
 a) Rhodospirillum b) Azotobacter c) Clostridium d) Rhizobium
160. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: Plants obtain molybdenum in the form of molybdate ions (MoO₄²⁺).
Reason: Molybdenum is a component of pollen germination, cell elongation and cell differentiation.
- a)
 If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
 If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false d) If both assertion and reason are false

161. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: Plants absorb calcium from soil in the form of calcium ions (Ca^{2+}).

Reason: Calcium is required by meristematic and differentiating tissues.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

162. Select the mismatched pair.

a) Symbiotic bacteria - Rhizobium, Frankia

b) Symbiotic cyanobacteria - Frankia, Aulosira

c) Free-living bacteria - Beijerinckia, Azotobacter d) None of these

163. Ammonia synthesis by nitrogenase requires

a) high input of energy b) super oxygen radicals c) Mn^{2+} d) none of these

164. With reference to absorption of minerals, the term 'outer space' represents _____ while 'inner space' represents _____

a) intercellular space and cell wall; cytoplasm and vacuole

b) cytoplasm and vacuole; intercellular space and cell wall

c) intercellular space; vacuole d) cytoplasm; vacuole

165. Which one of the following is not a micronutrient?

a) Molybdenum b) Magnesium c) Zinc d) Boron

166. In the following questions, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: Ammonia is converted into nitrate by soil bacteria like Nitrosomonas and Nitrobacter.

Reason: These nitrifying bacteria are photoautotrophs.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

167. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: The prominent symptom of manganese toxicity is the appearance of brown spots surrounded by chlorotic veins.

Reason: Excess of manganese may induce deficiencies of iron, magnesium and calcium

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false.

168. Which one of the following roles is not characteristic of an essential element?

a) Being a component of biomolecules b) Changing the chemistry of soil

c) Being a structural component of energy related chemical compounds

d) Activation or inhibition of enzymes

169. Select the correct statement(s) regarding the solution culture techniques

a)

Successful hydroponic culture requires a large volume of nutrient solution or frequent adjustment of the nutrient solution to prevent roots from producing radical changes in nutrient concentrations and pH of the medium.

b)

In nutrient film growth system, plant roots lie on the surface of a trough, and nutrient solutions flow in a thin layer along the trough over the roots.

c)

In aeroponics technique, plants are grown with their roots suspended in air while being sprayed continuously with a nutrient solution.

d) All of these

170. Read the given statements and select the correct option.

Statement 1 : Deficiency symptoms of N, K and Mg are first visible in the senescent leaves.

Statement 2 : Biomolecules containing these elements are broken down in the older leaves, making these elements available for mobilising to younger leaves

a) Both statements 1 and 2 are correct

b) Statement 1 is correct but statement 2 is incorrect

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect

171. Die back disease in citrus is due to deficiency of:

a) Mo b) B c) Cu d) Zn

172. Read the following statements and select the incorrect ones.

(i) The co-ordinated activities of the legume and Rhizobium bacteria depend on chemical interactions between the symbiotic partners.

(ii) Leguminous roots secrete chemical attractants that attract Rhizobium bacteria living nearby.

- (iii) N, P and K usually do not get deficient in soil due to their low plant requirement.
(iv) Nitrogen cycle is regular circulation of nitrogen amongst living organisms with its reservoir pool in lithosphere and cycling pool in atmosphere.
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (ii), (iii) and (iv)
173. Which one of the following mineral elements plays an important role in biological nitrogen fixation?
a) Molybdenum b) Copper c) Manganese d) Zinc
174. Which of the following is not a criterion for essentiality of an element?
a) Requirement of the element is specific
b) Necessary for normal growth and reproduction
c) Not replaceable by another element d) Indirectly involved in plant metabolism
175. The process that is the opposite of nitrogen fixation is
a) nitrification b) denitrification c) ammonification d) nitrate reduction
176. The major portion of the dry weight of plants comprises of _____.
a) Carbon, hydrogen and oxygen b) Nitrogen, phosphorus and potassium
c) Calcium, magnesium and sulphur d) Carbon, nitrogen and hydrogen
177. Essential elements are:
a) only macronutrients b) only micronutrients c) both macro and micronutrients
d) C, H, O and N only.
178. Which of the following elements in plants is not immobilized?
a) Sulphur b) Phosphorus c) Calcium d) Potassium
179. Boron in green plants assists in _____.
a) sugar transport b) activation of enzymes c) acting as enzyme cofactor
d) photosynthesis
180. _____ conditions are created by leghaemoglobin in the root nodule of a legume.
a) Aerobic b) Anaerobic c) Acidic d) Alkaline
181. Deficiency symptoms tend to appear first in _____ whenever the essential elements are relatively immobile and are not transported out of the mature organs.
a) younger tissues b) older tissues c) roots d) shoots
182. In the initial phase of mineral ion absorption, there is a rapid uptake of ions into _____ space of cells. Ions absorbed in this phase are _____ exchangeable. It is _____ uptake as it _____ the expenditure of metabolic energy.
a) inner, not freely, active, requires b) inner, freely, passive, requires
c) outer, freely, passive, does not require d) outer, not freely, active, requires
183. Reaction carried out by N₂ fixing microbes include
 $2\text{NH}_3 + 3\text{O}_2 \rightarrow 2\text{NO}_2^- + 2\text{H}^+ + 2\text{H}_2\text{O}$ (i)
 $2\text{NO}_2^- + \text{O}_2 \rightarrow 2\text{NO}$; (ii)
Which of the following statements about these equations is not true?

- a) Step (i) is carried out by Nitrosomonas or Nitrosococcus.
- b) Step (ii) is carried out by Nitrobacter.
- c) Both steps (i) and (ii) can be called nitrification.
- d) Bacteria carrying out these steps are usually photoautotrophs.

184. Which of the following is a free-living nitrogen fixing cyanobacteria?

- a) Cyndrospermum b) Nostoc c) Rhodospirillum d) Both (a) and (b)

185. The process of conversion of soil nitrates into free N_2 is called ____ (i) ____ and is carried out by bacteria ____ (ii) ____.

a)

I	II
nitrification	Nitrosomonas

b)

I	II
denitrification	Nitrobacter

c)

I	II
denitrification	Thiobacillus

d)

I	II
N_2 fixation	Rhizobium

186. An element playing important role in nitrogen fixation is ____

- a) Molybdenum b) Copper c) Manganese d) Zinc

187. Best defined function of Manganese in green plants is ____

- a) Photolysis of water b) Calvin cycle c) Nitrogen fixation d) Water absorption

188. Nitrogen is absorbed by plants in form of

- a) NO_3^- b) NH_3 c) NO_2^- d) both (a) and (c).

189. Micronutrients are present in plant tissues in concentrations less than _____ of dry matter.

- a) 1 m mole Kg^{-1} b) 10 m mole Kg^{-1} c) 0.1 m mole Kg^{-1} d) 2 m mole Kg^{-1}

190. A. The parts of plants that show deficiency symptoms also depend on mobility of the element in the plant.

B. Actively mobilised elements like N, P, Mg which are exported to young developing tissues show deficiency symptoms first in older, senescent parts.

- a) Only A is correct b) Only B is correct c) Both A and B are correct
- d) Both A and B are incorrect

191. A. Nitrogen is a limiting nutrient for both natural and agricultural ecosystems

B. Plants do not compete with microbes for limited nitrogen available in soil.

- a) Only A is correct b) Only B is correct c) Both A and B are correct
- d) Both A and B are incorrect

192. Consider the following steps involved in nodule formation in the root of a legume.

- (i) Bacteria release chemicals and enzymes.
- (ii) Bacteria stop dividing and form bacterioides.
- (iii) Roots secrete chemical attractants.
- (iv) Formation of infection thread.
- (v) Formation of nodules.

(vi) Division of infected cortical cells.

(vii) Curling of root hair and degradation of their cell wall.

(viii) Infection thread grows along with multiplication of bacteria.

Arrange the steps in the right sequence and mark the correct option

a) (iii), (i), (vii), (iv), (viii), (vi), (v), (ii) b) (iii), (iv), (viii), (i), (vi), (vii), (ii), (v)

c) (i), (iv), (iii), (vi), (v), (vii), (viii), (ii) d) (i), (iii), (vi), (iv), (viii), (ii), (v), (vii)

193. Which one of the following symptoms is not due to manganese toxicity in plants?

a) Calcium translocation in shoot apex is inhibited.

b) Deficiency in both iron and nitrogen is induced.

c) Appearance of brown spot surrounded by chlorotic veins. d) None of the above

194. Select the correct statement regarding manganese toxicity

a) Appearance of brown spots surrounded by chlorotic veins

b) Inhibition of Ca translocation in shoot apex c) Induction deficiencies of Mg and Fe

d) All of these

195. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as:

Assertion: Deficiency symptoms appear when the availability of the essential nutrients falls below the critical concentration.

Reason: Critical concentration is that limited concentration of the essential element below which growth of the plant is reduced

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false

196. Which one of the following is correctly matched?

a) Passive transport of nutrients - ATP b) Apoplast - plasmodesmata

c) Potassium - Readily immobilisation d) Bakane of rice seedlings - F. Skoog

197. Which element is not considered as macronutrient?

a) Mg b) Ca c) Mn d) P

198. Which one of the following is not an essential element for plants?

a) Potassium b) Iron c) Iodine d) Zinc

199. The technique of hydroponics was first demonstrated by

a) M. Calvin (1961) b) Julius Von Sachs (1860) c) Arnon (1940)

d) Hoagland (1940).

200. Which of the following is a free living aerobic non-photosynthetic nitrogen fixer?

a) Rhizobium b) Azotobacter c) Azospirillum d) Nostoc



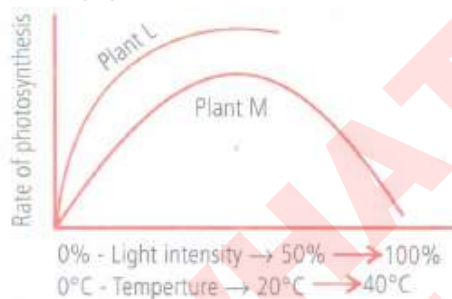
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PHOTOSYNTHESIS IN HIGHER PLANTS 1

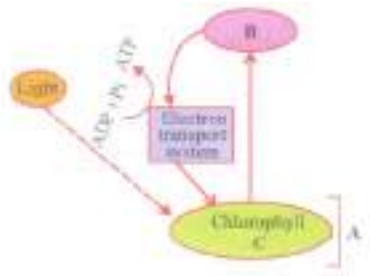
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1. Select the correct match.
a) Stroma - Light reactions b) Membrane system - Trapping of light energy
c) Thylakoids - CO_2 fixation d) Stromal lamellae - Synthesis of ATP
2. During fixation of one molecule of CO_2 by C_3 plants, number of ATP and NADPH_2 required are
a) 3 ATP and 2 NADPH_2 b) 5 ATP and 2 NADPH_2 c) 12 ATP and 12 NADPH_2
d) 2 ATP and 3 NADPH_2
3. When two plants L and M were exposed to different light intensities and temperatures, they showed changes in their rates of photosynthesis, which have been represented in the following graph.



- The graph indicates that
- a) plant L is a C_3 plant for which the light saturation point is 100% of full sunlight
 - b) plant M is a C_4 plant for which the optimum temperature is around 20°C
 - c) plant M is a C_3 plant which is more affected at higher temperature and higher light intensity as compared to plant L
 - d) plant L is a C_4 plant and cannot function at light intensities above the saturation point.
4. The factor which is not limiting in normal conditions for photosynthesis is
a) water b) chlorophyll c) light d) carbon dioxide
 5. Photosynthetic pigments such as chl a, chl b, xanthophyll and carotene can be separated by which of the following techniques?
a) Paper chromatography b) Gel Electrophoresis c) X-ray diffusion d) ELISA test
 6. Pigment-containing membranous extensions in some cyanobactena are____
a) Basal bodies b) pneumatophores c) Chromatophores d) Heterocysts
 7. Oxygenic photosynthesis occurs in____
a) Oscillatoria b) Rhodospirillum c) Chlorobium d) Chromatium
 8. Bundle sheath chloroplast of C_4 plant are
a) Large & agranal b) Large & granal c) small & agranal d) small & granal

9. The substrate for photorespiration is _____
 a) ribulose bis-phosphate b) glycolate c) serine d) glycine
10. A very efficient converter of solar energy with net productivity of 2- 4 kg/m² or more is the crop of _____.
 a) Wheat b) Sugarcane c) Rice d) Bajra
11. Dark reactions of photosynthesis occur in_____
 a) granal thylakoid-membranes b) stromal lamella membranes
 c) stroma outside photosynthetic lamellae d) periplastidial space
12. Study the given flow chart of cyclic photophosphorylation and select the correct answer for A, B and C.



a)

A	B	C
PS II	Cytochrome	P 680

b)

A	B	C
PS I	e- acceptor	P 680

c)

A	B	C
PS I	e- acceptor	P 700

d)

A	B	C
PS II	Cytochrome	P 700

13. **Assertion:** The C₄ plants have a special type of leaf anatomy called kranz anatomy.
Reason: Chloroplasts of bundle sheath cells have well-developed grana and starch grains.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
14. Element which helps in electron transport in the process of photosynthesis is
 a) Zinc b) Molybdenum c) Boron d) Manganese
15. How many ATP and NADPH₂ are respectively produced in the process of photorespiration?
 a) 2 and 4 b) 1 and 2 c) 4 and 6 d) 0 and 0
16. **Assertion:** The colour of the leaf is due to the presence of four pigments-chlorophyll a, chlorophyll b, xanthophylls and carotenoids.
Reason: Chlorophyll b is the chief pigment associated with photosynthesis.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false
17. Photosystem-II occurs in_____
 a) stroma b) cytochrome c) grana d) mitochondrial surface

18. Photosynthesis is
a) Oxidative, exergonic, catabolic b) Redox-reaction, endergonic, anabolic
c) Reductive, endergonic, catabolic
19. The size of chlorophyll molecule is _____.
a) head $15 \times 15 \text{ \AA}$, tail 25 \AA b) head $20 \times 20 \text{ \AA}$, tail 25 \AA c) head $15 \times 15 \text{ \AA}$, tail 20 \AA
d) head $10 \times 12 \text{ \AA}$, tail 25 \AA
20. In photosynthesis the light-independent reactions take place at ____
a) Photosystem-I b) photosystem-II c) Stromal matrix d) Thylakoid lumen
21. Nine-tenth of all photosynthesis of world (85-90%) is carried out by _____.
a) large trees with millions of branches and leaves b) algae of the ocean
c) chlorophyll containing ferns of the forest d) scientists in the laboratories
22. Energy required for ATP synthesis in PSII comes from
a) proton gradient b) electron gradient c) reduction of glucose d) oxidation of glucose
23. Ingenhousz in an experiment showed that in bright sunlight, small bubbles were formed around the green parts of the plant, while in the dark, they did not. He identified these bubbles to be of
a) CO_2 b) H_2O c) O_2 d) H_2
24. Product of light reaction of photosynthesis is
a) Carbohydrate b) ATP c) NADP and O_2 d) NADPH_2 ATP & O_2
25. With reference to factors affecting the rate of photosynthesis. Which of the following statements is not correct?
a) Light saturation for CO_2 fixation occurs at 10% of full sunlight
b) Increasing atmospheric CO_2 concentration upto 0.05% can enhance CO_2 fixation rate
c)
C3 plants responds to higher temperatures with enhanced photosynthesis while C4 plants have much lower temperature optimum
d)
Tomato is a greenhouse crop which can be grown in CO_2 enriched atmosphere for higher yield
26. Which of the following is not an external factor influencing photosynthesis?
a) CO_2 concentration b) O_2 concentration c) Availability of water
d) Chlorophyll concentration
27. In photosystem-I the first electron acceptor is _____.
a) Cytochrome b) Plastocyanin c) An iron-sulphur Protein d) Ferredoxin
28. PEP is primary CO_2 acceptor in:
a) C_4 plants b) C_3 plants c) C_2 plants d) both C_3 and C_4 plants
29. CAM helps the plants in _____.
a) conserving water b) secondary growth c) disease resistance d) reproduction
30. Which of the following absorb light energy for photosynthesis?
a) Chlorophyll b) Water molecule c) O_2 d) RUBP

31. Photorespiration is favoured by_____
- a) high O_2 and low CO_2 b) low light and high O_2 c) low temperature and high O_2
d) low O_2 and high CO_2
32. During photocatalytic splitting of water, liberation of O_2 requires
- a) Mn^{2+} b) Cl^- c) Ca^{2+} d) All of these.
33. Cytochrome is_____
- a) Metallo - Flavo protein b) Fe-containing porphyrin pigment c) Glycoprotein d) Lipid
34. Study the following statements regarding chl a molecule.
- (i) Molecular formula of chl a is $C_{55}H_{72}O_5N_4Mg$.
(ii) It is the primary photosynthetic pigment.
(iii) In pure state, it is red in colour and thus it absorbs more blue wavelength of light than the red wavelength.
(iv) It is soluble in water as well as petroleum ether.
- Which of the above statements is/are not correct?
- a) (i) and (iii) b) (iii) and (iv) c) (ii) only d) (iv) only
35. Formation of ATP in photosynthesis and respiration is an oxidation process which utilises the energy from_____
- a) cytochromes b) ferredoxin c) electrons d) carbon dioxide
36. During Hatch and Slack pathway, PEP combines with CO_2 in the presence of enzyme PEP Case, to form OAA. This process of initial fixation of CO_2 occurs in
- a) mesophyll cells b) bundle sheath cells c) both (a) and (b) d) none of these.
37. Photosynthesis in C_4 plants is relatively less limited by atmospheric CO_2 level because of_____
- a) Effective pumping of CO_2 into bundle sheath cells.
b) Rubisco in C_4 plants has higher affinity for CO_2
c) Four carbon acids are the primary initial CO_2 fixation products.
d) The primary fixation of CO_2 is mediated via PEP carboxylase
38. Glucose synthesis occurs during which stage of C_3 cycle?
- a) Carboxylation b) Oxygenation c) Reduction d) Regeneration
39. Who, after conducting experiments on purple and green sulphur bacteria, inferred that O_2 evolved during photosynthesis comes from H_2O not from CO_2 ?
- a) Sachs b) Engelmann c) van Niel d) Blackmann
40. CO_2 concentrating steps are found in
- a) C_3 plants b) C_4 plants c) CAM plants d) Temperate plants only
41. Chlorophyll in chloroplasts is located in_____
- a) grana b) Pyrenoid c) stroma d) both grana and stroma
42. Read the following four statements, A, B, C and D and select the right option having both correct statements
- Statements:
- (A) Z scheme of light reaction takes place in presence of PSI only

- (B) Only PSI is functional in cyclic photophosphorylation
 (C) Cyclic photophosphorylation results into synthesis of ATP and NADPH₂
 (D) Stroma lamellae lack PSII as well as NADP
 a) A and B b) B and C c) C and D d) B and D

43. Splitting of water is associated with

- a) photosystem I b) lumen of thylakoid c) both photosystem I and II
 d) inner surface of thylakoid membrane.

44. Which of the following is not a product of light reaction of photosynthesis?

- a) NADPH b) NADH c) ATP d) Oxygen

45. **Assertion:** Tropical plants have a higher optimum temperature for photosynthesis than temperate plants.

Reason: The temperature optimum for photosynthesis of different plants depends on their habitat.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

46. Secondary xylem and phloem in dicot stem are produced by _____

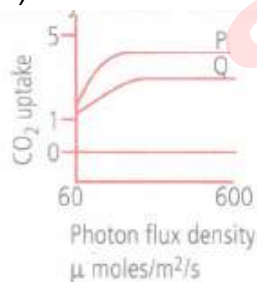
- a) phellogen b) vascular cambium c) apical meristems d) axillary meristems

47. The main difference between chlorophyll 'a' and 'b' is :

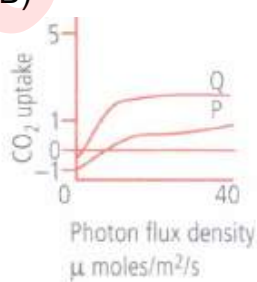
- a) Chlorophyll 'a' is all a linear chain compound and 'b' is branched chain
 b) Chlorophyll 'a' has no Mg⁺ ion in center of molecule
 c) In chlorophyll 'a' there is -CH₃ group whereas in 'b' it is -CHO group d) All of the above

48. Which of the following graphs correctly depicts the rate of photosynthesis of sun plant (P) and shade plant (Q)?

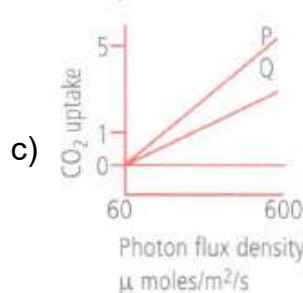
(A)



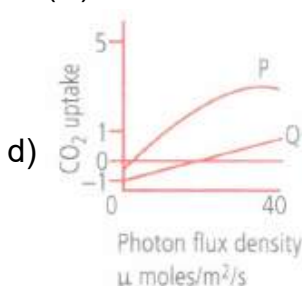
(B)



(C)



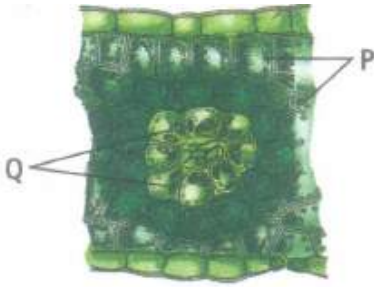
(D)



49. Which of the following scientists concluded by his experiments that green plant parts play a role in purifying the noxious air only in the presence of sunlight?

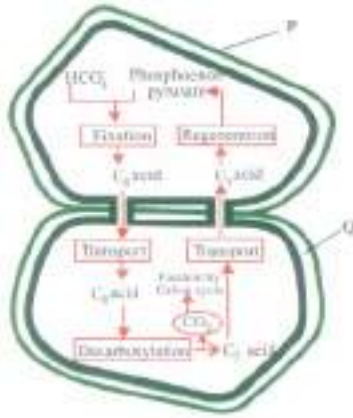
- a) Priestley b) Ingenhousz c) Sachs d) Engelmann
50. How many ATP and NADPH molecules are respectively required to make one molecule of glucose through Calvin cycle?
a) 3 and 2 b) 9 and 6 c) 18 and 12 d) 12 and 18
51. In PSI, the reaction centre Chi a has absorption maxima at _____ ; whereas in PS II, the reaction centre Chi a has absorption maxima at _____.
a) 700 nm, 680 nm b) 680 nm, 700 nm c) 400 nm, 500 nm d) 700 nm, 800 nm
52. The principle of limiting factors was proposed by _____.
a) Blackmann b) Hill c) Arnon d) Liebig
53. Which of the following is produced during the light phase of photosynthesis?
a) ATP b) NADPH₂ c) Both ATP and NADPH₂ d) Carbohydrates
54. When CO₂ is added to PEP, the first stable product synthesised is:
a) pyruvate b) glyceraldehyde- 3-phosphate c) phosphoglycerate d) oxaloacetate.
55. Read the given statements and select the correct option.
Statement 1: Carboxylation is the most crucial step of Calvin cycle where CO₂ is utilised for the carboxylation of RuBP.
Statement 2: Carboxylation is catalysed by the enzyme RuBisCO which results in the formation of two molecules of 3PGA.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect
56. Which element is located at the centre of the porphyrin ring in chlorophyll?
a) Manganese b) Calcium c) Magnesium d) Potassium
57. **Assertion:** The splitting of water is associated with PS II
Reason: Water is split into H⁺, O₂ and electrons.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
58. A CAM help the plants in
a) Reproduction b) Secondary growth c) Conserving water d) Disease resistance
59. Mints adapted to low light intensity have____
a) larger photosynthetic unit size than the sun plants
b) higher rate of CO₂ fixation than the sun plants c) more extended root system.
d) leaves modified to spines
60. Stomata of CAM plants_____
a) never open b) are always open c) open during the day and close at night
d) open during the night and close during the day

61. Refer to the given cross section of a C_4 leaf and select the incorrect option.



- a) P are the chloroplasts in which thylakoids are stacked together to form grana.
b)
P are the chloroplasts which can perform light reaction, evolve molecular O_2 and produce assimilatory power.
c) Q are the chloroplasts in which thylakoids occur as stroma lamellae.
d)
Q are the chloroplasts in which CO_2 is fixed by phosphoenol pyruvic acid to form oxaloacetic acid.
62. Chlorophyll a appears _____ in colour and chlorophyll b appears _____ in colour in the chromatogram
a) bluish green, yellowish green b) yellowish green, bluish green c) blue, blue
d) green, green
63. Which of the following is the site of photolysis of water?
a) Stroma of chloroplast b) Cristae of chloroplast c) Ribosome of chloroplast
d) Lumen of thylakoid sacs
64. RuBisCO is _____.
a) RuBP carboxylase b) RuBP oxygenase c) RuBP carboxylase-oxygenase
d) RuBP carboxydismutase.
65. PSI occurs in -
a) Appressed part of granal thylakoids
b) Appressed and non-appressed part of grans thylakoids c) stroma
d) stroma thylakoids and non-appressed part of grans thylakoids
66. **Assertion:** In C_4 plants, the bundle sheath cells are rich in an enzyme phosphoenol pyruvate carboxylase (PEPCase).
Reason: In C_4 plants, the mesophyll cells are rich in an enzyme Ribulose biphosphate carboxylase-oxygenase (RuBisCO).
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
67. Who provided the evidence that glucose is formed during photosynthesis and is then stored in the form of starch?
a) Sachs b) Engelmann c) van Niel d) Blackmann

68. Which kind of cells are represented by letters P and Q in the given figure showing C_4 pathway?



a)

P	Q
Palisade parenchyma	Spongy parenchyma

b)

P	Q
Spongy parenchyma	Palisade parenchyma

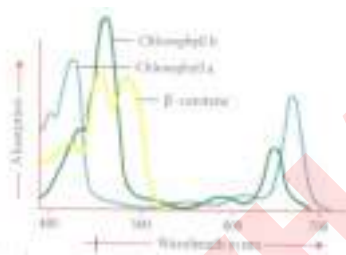
c)

P	Q
Mesophyll cell	Bundle sheath cell

d)

P	Q
Bundle sheath cell	Mesophyll cell

69. Given graph represents the absorption spectra of three photosynthetic pigments, chi a, chi b and β -carotene.



Select the correct statement regarding this.

a)

The curve showing the amount of absorption of different wavelengths of light by a photosynthetic pigment is called as absorption spectrum.

b) Chi a and chi b absorb maximum light in blue and red wavelengths of light.

c) Rate of photosynthesis is maximum in blue and red wavelengths of light. d) All of these

70. Read the given statements and select the correct option.

Statement 1: Photorespiration interferes with the successful functioning of Calvin cycle.

Statement 2: Photorespiration oxidises ribulose-1, 5 biphosphate which is an acceptor of CO_2 in Calvin cycle.

a) Both statements 1 and 2 are correct.

b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect

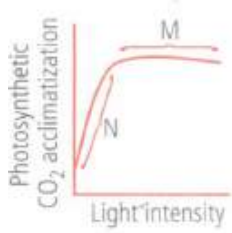
71. Stomata in grass leaf are _____

a) rectangular b) kidney-shaped c) dumb-bell-shaped d) barrel-shaped

72. The first carbon dioxide acceptor in C_4 - plants is _____ .

- a) phosphoenol-pyruvate b) ribulose 1, 5-diphosphate c) oxalo acetic acid
d) phosphoglyceric acid

73. A typical light response curve of photosynthesis is shown. The limiting factor/s for photosynthesis at M and N is/are



- a) temperature and CO₂ respectively b) CO₂ and light respectively c) only CO₂
d) light and CO₂ respectively.
74. Incorrect statement in relation to chemiosmotic hypothesis is
a) Primary electron acceptor is located towards outer side of membrane
b) NADP reductase is located on lumen side of thylakoid membrane
c) Splitting of water releases protons in the lumen of thylakoid membrane
d) Decrease in pH of thylakoid lumen due to proton accumulation
75. Maximum solar energy is trapped by _____
a) planting trees b) cultivating crops c) growing algae in tanks d) growing grasses
76. Select the incorrect pair
a) 2-carbon compound - Aspartic acid b) 3-carbon compound - PGA
c) 4-carbon compound - Malic acid d) 5-carbon compound - RuBP
77. c-4 plants are found among
a) Only gramineae b) Only monocot c) Only dicot d) Monocots and dicots
78. Which one of the following correctly depicts the biochemical reaction for photosynthesis?
- a) $C_6H_{12}O_6 + 6O_2 \xrightarrow{\text{Enzymes}} 6CO_2 + 6H_2O + \text{energy}$
b) $C_6H_{12}O_6 + 6O_2 + 6H_2O \rightarrow 6CO_2 + 12H_2O + \text{energy}$
c) $6CO_2 + 6H_2O \xrightarrow[\text{Chlorophyll}]{\text{sunlight}} C_6H_{12}O_6 + 6O_2$
d) $6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{sunlight}} C_6H_{12}O_6 + 6O_2 + 6H_2O$
79. Oxygen is not produced during photosynthesis by _____
a) Cycas b) Nostoc c) Green sulphur bacteria d) Chara
80. Assume a thylakoid which is somehow punctured so that the interior of the thylakoid is no longer separated from the stroma. This damage will have the most direct effect on which of the following processes?
a) Splitting of water b) Absorption of light energy by chlorophyll
c) Flow of electrons from photosystem II to photosystem I d) Synthesis of ATP
81. Which of the following statements about dark reactions is correct?
a) They occur in darkness. b) They are not light dependent.
c) They are dependent upon the products synthesised during light reactions. d) All of these

82. Match column I with column II and select the correct option from the given codes.

	Column I		Column II
A.	C ₄ plants	(i)	Succulents
B.	Chlorophyll b	(ii)	Accessory photosynthetic pigment
C.	PSII	(iii)	Photooxidation of H ₂ O
D.	CAM	(iv)	Kranz anatomy

- a) A-(iv), B-(ii), C-(iii), D-(i) b) A-(iii), B-(ii), C-(iv), D-(i) c) A-(i), B-(iii), C-(iii), D-(iv)
d) A-(i), B-(ii), C-(iii), D-(iv)
83. PGA as the first CO₂ fixation product was discovered in photosynthesis of _____
a) Bryophyte b) Glmnosperm c) Angiosperm d) Alga
84. PGA as the first carbon dioxide fixation product was discovered in photosynthesis of
a) Gymnosperm b) Angiosperm c) Alga d) Bryophyte
85. In photosynthesis energy from light reaction to dark reaction is transferred in the form of _____
a) ADP b) ATP c) RUDP d) Chlorophyll
86. Optimum temperature conditions for photosynthesis in C₃ and C₄ plants are respectively
a) 10°C-25°C and 30°C-45°C b) 30°C-45°C and 10°C-25°C c) 0°C-10°C and 10°C-30°C
d) 25°C-30°C and 40°C -50°C.
87. Kranz anatomy is typical of _____
a) C₄ - Plants b) C₃ - Plants c) C₂ - Plants d) CAM - Plants
88. Number of carboxylations reactions during fixation of one CO₂ molecule in sorghum and maize is
a) 1 b) 2 c) 3 d) 4
89. Carbon dioxide joins the photosynthetic pathway in _____
a) PS - I b) PS - II c) light reaction d) dark reaction
90. Identify the correct sequence of stages of Calvin cycle.
a) Reduction → Carboxylation → Regeneration
b) Carboxylation → Regeneration → Reduction
c) Carboxylation → Reduction → Regeneration
d) Reduction → Regeneration → Carboxylation
91. In C₄-plants, Calvin cycle operates in _____.
a) stroma of bundle sheath chloroplasts b) grana of bundle sheath chloroplasts
c) grana of mesophyll chloroplasts d) stroma of mesophyll chloroplasts
92. Glycolate induces opening of stomata in _____
a) presence of oxygen b) low CO₂ con. c) high CO₂ con d) absence of CO₂
93. **Assertion:** The external factors that affect photosynthesis are number, size, age and orientation of leaves, mesophyll cells and chloroplasts and the amount of chlorophyll.
Reason: The internal factors that affect photosynthesis are availability of sunlight, temperature, CO₂ concentration and water.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

94. In C_4 plants, first product of CO_2 fixation is

a) 3-PGA b) OAA c) Malic acid d) Glutamic acid

95. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. C_3 plants	(i) Kalanchoe, Opuntia
B. C_4 plants	(ii) Maize, sugarcane
C. CAM plants	(iii) Helianthus

a)	b)	c)	d)
A B C	A B C	A B C	A B C
(ii)(iii)(i)	(i)(ii)(iii)	(iii)(ii)(i)	(i)(iii)(ii)

96. Which pigment acts directly to convert light energy to chemical energy?

a) Chlorophyll a b) Chlorophyll b c) Xanthophyll d) Carotenoid

97. The carbon dioxide acceptor in Calvin cycle/ C_3 - plants is _____.

a) Phosphoenol Pyruvate (PEP) b) Ribulose 1, 5-Diphosphate (RuDP)
c) Phosphoglyceric Acid (PGA) d) Ribulose Monophosphate (RMP)

98. In chloroplast, the highest number of protons are found in

a) Antenna complex b) Stroma c) Lumen of thylakoids d) Intermembrane space

99. In the leaves of C_4 plants, malic acid formation during CO_2 fixation occurs in the cells of

a) Epidermis b) Mesophyll c) Bundle Sheath d) Phloem

100. C_4 plants are more efficient in photosynthesis than C_3 plants due to _____

a) Higher leaf area b) Presence of larger number of chloroplasts in the leaf cells
c) Presence of thin cuticle d) Lower rate of photorespiration

101. In C_4 plants, Calvin cycle enzymes are present in

a) chloroplasts of mesophyll cells b) chloroplasts of bundle sheath cells
c) cytoplasm of guard cells d) cytoplasm of epidermal cells

102. Which one of the following equations suggests that O_2 released during photosynthesis comes from water?

a) $6CO_2^{18} + 12H_2O \rightarrow 6O_2^{18} + C_6H_{12}O_6 + 6H_2O^{18}$
b) $6CO_2 + 12H_2O^{18} \rightarrow 6O_2 + C_6H_{12}O_6 + 6H_2O^{18}$
c) $6CO_2^{18} + 12H_2O \rightarrow 6O_2^{18} + C_6H_{12}O_6 + 6H_2O$
d) $6CO_2 + 12H_2O^{18} \rightarrow 6O_2^{18} + C_6H_{12}O_6 + 6H_2O$

103. Read the following statements and select the correct ones.

(i) PS I is involved in non-cyclic photophosphorylation only.
(ii) PS II is involved in both cyclic and non-cyclic photophosphorylation.
(iii) Stroma lamellae membranes possess PS I only, whereas grana lamellae membranes possess both PS I and PS II.
a) (i) only b) (ii) only c) (iii) only d) (i), (ii) and (iii)

104. Which of these is a type of phycobilin pigments?

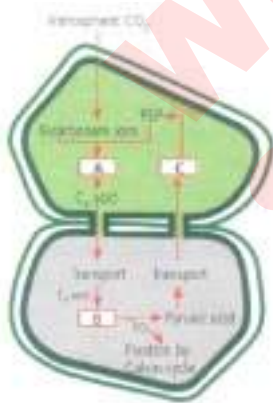
a) Phycocyanin b) Allophycocyanin c) Phycoerythrin d) All of these

105. Which pigment system is inactivated in red drop?

- a) PS-I and PS-II b) PS - I c) PS - II d) None of these
106. Cytochromes are found in _____.
a) Outer wall of mitochondria b) Cristae of mitochondria c) Lysosomes
d) Matrix of mitochondria
107. Protochlorophyll differs from chlorophyll in lacking____
a) 2 hydrogen atoms in one of its pyrrole rings
b) 2 hydrogen atoms in two of its pyrrole rings
c) 4 hydrogen atoms in one of its pyrrole rings
d) 4 hydrogen atoms in two of its pyrrole rings
108. The enzyme that catalyses initial carbon dioxide fixation in C_4 - plants is _____.
a) RuBP carboxylase b) PEP carboxylase c) carbonic anhydrase d) carboxydismutase
109. The wavelength of light absorbed by Pr form of phytochrome is _____.
a) 680nm b) 720nm c) 620nm d) 640nm
110. Wavelength of PAR (Photosynthetically active radiation) varies from
a) 40 - 70 nm b) 400 - 700 nm c) 400 - 700 \AA d) 40 - 70 \AA
111. Electron from excited chlorophyll molecule of photosystem II are accepted first by
a) Quinone b) Ferredoxin c) Cytochrome - b d) Cytochrome - f
112. Chlorophyll-a occurs in____
a) all photosynthetic autotrophs b) in all higher plants c) all oxygen liberating autotrophs
d) all plants except fungi
113. The essential element required for water splitting in photosynthesis leading to oxygen evolution is
a) Mo b) Mn c) Mg d) K
114. Quality of light refers to
a) intensity of light b) frequency of light c) wavelength of light d) duration of light.
115. Water soluble pigments found in plant cell vacuoles are____
a) Xanthophylls b) Chlorophylls c) Carotenoids d) Anthocyanins
116. CO_2 combines with RuBP in the presence of enzyme RuBisCO to form 3-PGA. This process of Calvin cycle is included under
a) carboxylation b) oxygenation c) reduction d) regeneration
117. Translocation of carbohydrate nutrients usually occurs in the form of____
a) glucose b) maltose c) starch d) sucrose
118. Absorption spectrum of chl a shows maximum absorption in_____ and_____ regions of light.
a) blue and green b) blue and red c) red and green d) red and far red
119. Stroma in the chloroplasts of higher plants contain
a) Chlorophyll b) Light dependent reaction enzymes
c) Light independent reaction enzymes d) Ribosomes
120. A point at which illuminated plant parts stop absorbing CO_2 from their environment, is known as

- a) CO₂ compensation point b) CO₂ saturation point c) CO₂ optimum point
d) CO₂ limiting point
121. The process which makes major difference between C₃ and C₄ plants is
a) Respiration b) Glycolysis c) Calvin cycle d) Photorespiration
122. Which enzyme is most abundantly found on earth?
a) Catalase b) RuBisCO c) Nitrogenase d) Invertase
123. C₄ - cycle was discovered by____
a) Hatch and Slack b) Calvin c) Hill d) Arnon
124. How many number of CO₂ molecules are required to synthesise one molecule of glucose during C₃ cycle?
a) One b) Three c) Six d) Five
125. During non-cyclic photophosphorylation, electrons are continuously lost from the reaction centre of PS II. Which source is used to replace these electrons?
a) Sunlight b) O₂ c) H₂O d) CO₂
126. PS II is located on
a) inner side of thylakoid membrane b) outer side of thylakoid membrane
c) lumen of thylakoid membrane d) stroma lamellae.
127. The reaction that is responsible for the primary fixation of CO₂ is catalysed by:
a) RuBP carboxylase b) PEP carboxylase c) RuBP carboxylase and PEP carboxylase
d) PGA synthase.
128. Emerson's enhancement effect and Red drop have been instrumental in the discovery of :
a) Oxidative phosphorylation b) Photophosphorylation and non-cyclic electron transport
c) Two photo systems operating simultaneously
d) Photophosphorylation and cyclic electron transport
129. The 'law of limiting factors' was given by_____ in the year_____.
a) Blackman, 1905 b) Blackman, 1804 c) Engelmann, 1909 d) Warburg, 1920
130. Which light range is least effective in photosynthesis?
a) Blue b) Green c) Red d) Violet
131. Which range of wavelength (in nm) is called photosynthetically active radiation (PAR)?
a) 100-390 b) 390-430 c) 400-700 d) 760-10,000
132. In cyclic photophosphorylation, the electron released by reaction centre (P₇₀₀) is ultimately accepted by
a) ferredoxin b) NADP⁺ c) reaction centre (P₇₀₀) d) plastocyanin
133. Visible part of electromagnetic spectrum consists of radiations having a wavelength in the range of
a) 400-800 nm b) 300-2600 nm c) 390-760 nm d) 650-760 nm
134. For NADPH⁺ H⁺ formation:
a) only PS I is required b) only PS II is required c) both PS I and PS II are required
d) only stroma is required

135. The 'Red - drop' phenomenon is due to the distribution of the photo chemical activity of
a) PS-I b) PS-I & PS-II both c) PS-II d) Carotenoids
136. Process that makes important difference, between C_3 and C_4 plants is _____.
a) Transpiration b) Glycolysis c) Photosynthesis d) photorespiration
137. Dark reaction in photosynthesis is called so because
a) it can occur in dark also b) it does not directly depend on light energy
c) it cannot occur during day light d) it occurs more rapidly at night.
138. In light reaction, plastoquinone facilitates the transfer of electrons from_____
a) PS-I to NADP+ b) PS-I to ATP synthase c) PS-II to Cytb6f complex
d) Cytb-6complex to PS-I
139. The enzyme RuBisCO has
a) more affinity for CO_2 , than for O_2 b) more affinity for O_2 , than for CO_2
c) equal affinity for both d) more affinity for sugars, than for CO_2 .
140. Which one of the following ions is essential for photolysis of water?
a) Manganese b) Zinc c) Copper d) Boron
141. The C_4 plants are photosynthetically more efficient than C_3 plants because_____
a) the CO_2 compensation point is more
b) CO_2 generated during photorespiration is trapped and recycled through PEP carboxylase
c) the CO_2 efflux is not Prevented d) they have more chloroplasts
142. Indigo and red regions of VIBGYOR, respectively fall in the range of wavelength
a) 430-470 nm and 660-760 nm b) 300-390 nm and 600-650 nm
c) 390-760 nm and 430-470 nm d) 660-760 nm and 430-470 nm.
143. Given figure represents C_4 pathway. Select the suitable options for A, B and C.



a)

A	B	C
Decarboxylation	Reduction	Regeneration

b)

A	B	C
Fixation	Transamination	Regeneration

c)

A	B	C
Carboxylation	Decarboxylation	Reduction

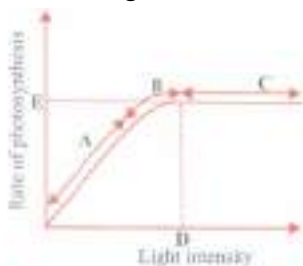
d)

A	B	C
Fixation	Decarboxylation	Regeneration

144. In the leaves of C_4 plants, malic acid formation during CO_2 fixation occurs in the cells of_____
a) bundle sheath b) Phloem c) epidermis d) mesophyll

145. How many quanta are required to reduce one molecule of CO_2 and produce one molecule of O_2 in green plant photosynthesis?
a) 1 b) 8 c) 16 d) 32
146. The process of photo-phosphorylation take place in
a) Cell-wall b) Chloroplast c) Ribosomes d) Mitochondria
147. Which of the following is not a product of light reaction of photosynthesis?
a) NADPH b) NADH c) ATP d) Oxygen
148. Which of the following equations holds true for acidification reactions of CAM pathway?
a) $\text{PEP} + \text{CO}_2 + \text{H}_2\text{O} \xrightarrow{\text{PEP case}} \text{OAA} + \text{H}_3\text{PO}_4$
b) $\text{OAA} + \text{NADH} \xrightarrow{\text{Dehydrogenase}} \text{Malic acid} + \text{NAD}^+$
c) $\text{Malic acid} + \text{NADP}^+ \xrightarrow[\text{enzyme}]{\text{Malic}} \text{Pyruvic acid} + \text{CO} + \text{NADPH}$ d) Both (a) and (b)
149. Cyclic photophosphorylation results in the formation of
a) ATP and NADPH b) NADPH and O_2 c) NADPH d) ATP
150. Phospho enol Pyruvate (PEP) is the primary CO_2 acceptor in:
a) C_3 plants b) C_4 plants c) C_2 plants d) C_3 and C_4 plants
151. Consider the following statements regarding starch and sucrose synthesis during day time and select the correct ones.
(i) Triose phosphate is confined to chloroplast and is utilised for the synthesis of starch only.
(ii) Triose phosphate is translocated to cytosol from chloroplast.
(iii) Triose phosphate is utilised for the synthesis of both starch and sucrose.
(iv) Triose phosphate is translocated from cytosol to chloroplast
a) (i) and (iii) b) (ii) and (iii) c) (ii) and (iv) d) (iii) and (iv)
152. Which pigment system donates e^- for the reduction of NADP
a) PS II b) PS I c) CO_2 d) Plastoquinone
153. NADP^+ is reduced to NADPH in _____
a) PS - I b) PS - II c) Calvin cycle d) Non-cyclic photophosphorylation
154. The correct sequence of flow of electrons in the light reaction is
a) PSII, plastoquinone, cytochromes, PSI, ferredoxin
b) PSI, plastoquinone, cytochromes, PSII, ferredoxin c) PSI, ferredoxin, PSII
d) PSI, plastoquinone, cytochromes, PSII, ferredoxin.
155. To reduce 1 CO_2 in C_3 cycle, assimilatory power needed is
a) 3ATP, 2 NADPH_2 b) 2 ATP, 3 NADPH_2 c) 5 ATP, 2 NADPH_2 d) 6 ATP, 2 NADPH_2
156. During monsoon, the rice crop of Eastern states of India shows lesser yield due to limiting factor of _____
a) CO_2 b) light c) temperature d) water
157. During high light intensity, the chloroplasts align themselves
a) in vertical position along lateral walls b) along tangential walls
c) in centre and get scattered d) perpendicular to light.

158. Reaction centre of PSI is _____ and reaction centre of PS II is _____.
a) P680, P700 b) P700, P680 c) P800, P600 d) P700, P900
159. Which of the following statements is incorrect regarding the Calvin cycle of C_3 plants?
a) First stable product of Calvin cycle in C_3 plants is 3-Phosphoglyceric acid.
b) Sunflower is an example of C_3 plants.
c) Calvin cycle occurs in bundle sheath cells of C_3 plants.
d) Enzyme PEPcase is absent in C_3 plants.
160. Red colour of tomatoes, carrots and chilies is due to the presence of a type of carotene pigment called as
a) lutein b) lycopene c) fucoxanthin d) phycoerythrin
161. Select the incorrect statement as far as kranz anatomy is concerned.
a) Undifferentiated mesophyll occurs in concentric layers around vascular bundles.
b) Centrifugal chloroplasts are present in bundle sheath cells.
c) Large sized bundle sheath cells are arranged in a wreath-like manner in one to several layers
d) Chloroplasts of bundle sheath cells possess well developed grana lamellae
162. Photosynthetically active radiation is represented by the range of wavelength _____.
a) 340 - 450nm b) 400 - 700nm c) 500-600nm d) 400-950nm
163. Name the scientist, who first pointed out that plants purify foul air by bell jar experiment
a) Willstatter b) Robert Hooke c) Priestly d) lean Snebier
164. When temperature is increased from minimum to optimum, rate of photosynthesis doubles for every _____ rise in temperature.
a) 1°C b) 10°C c) 20°C d) 30°C
165. Which one is involved in Z-scheme of photosynthesis?
a) PS I (b) b) PS II c) e carriers d) All of these
166. Study the given graph showing the effect of light intensity on the rate of photosynthesis. Which of the following statements regarding this is correct?



- a) Light is a limiting factor in the region A.
b) Region C represents that rate of photosynthesis is not increased further by increasing light intensity because some other factor became limiting.
c) Point D represents the intensity of light at which some other factor became limiting.
d) All of these

167. **Assertion:** Dark reactions are called biosynthetic phase of photosynthesis.
Reason: Dark reactions do not directly depend on the presence of light but are dependent on the products of the light reaction, i.e., ATP and NADPH.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
168. **Assertion:** Photorespiration is a wasteful process.
Reason: In photorespiratory pathway, there is no synthesis of sugars or ATP.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
169. **Assertion:** In C_4 plants, photorespiration does not occur.
Reason: C_4 plants have a mechanism that increases the concentration of CO_2 at the enzyme site.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
170. The biochemical objective of PS I is to
a) oxidise NADPH b) hydrolyse ATP c) phosphorylate ADP d) reduce $NADP^+$.
171. The significance of light & chlorophyll in photosynthesis discovered by
a) Priestly b) Ingenhousz c) Englemann d) Blackman
172. Synthesis of complex organic substances from simple inorganic raw materials in the presence of sunlight and chlorophyll is called as _____, which is a _____ process.
a) photosynthesis, anabolic b) photosynthesis, catabolic c) respiration, anabolic
d) respiration, catabolic
173. NADPH is generated through____
a) photosystem-I b) photosystem-II c) anaerobic respiration d) glycolysis
174. A photosynthesising plant is releasing ^{18}O more than the normal. The plant must have been supplied with _____.
a) O_3 b) H_2O with ^{18}O c) CO_2 with ^{18}O d) $C_6H_{12}O_6$ with ^{18}O
175. Kranz anatomy is not exhibited by which of the following plants?
a) Maize b) Sorghum c) Sugarcane d) Sunflower
176. Which pair is wrong
a) C_3 plant - maize b) Calvin cycle - PGA c) Hatch-Stack cycle - OAA
d) C_4 -plant Kranz Anatomy
177. When wheat and sugarcane leaves are fed with radioactive $^{14}CO_2$, in which molecule would the radioactivity appear first in these plants?

a)

Wheat	Sugarcane
3-Phosphoglycerate	Oxaloacetate

b)

Wheat	Sugarcane
3-Phosphoglycerate	3-Phosphoglycerate

c)

Wheat	Sugarcane
Oxaloacetate	Oxaloacetate

d)

Wheat	Sugarcane
Malate	3-Phosphoglycerate

178. **Assertion:** Chloroplasts occur inside the leaves mostly in mesophyll cells along their walls.

Reason: The membrane system of chloroplast is responsible for trapping the light energy and also for the synthesis of ATP and NADPH.

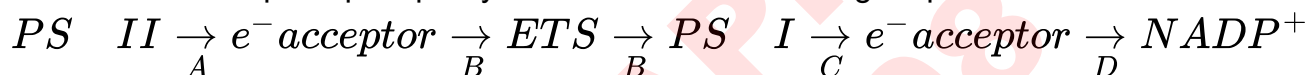
a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

179. The Z scheme of photophosphorylation follows the following sequence:



Which of the following options is correct for A, B, C and D transfer of electrons?

a)

A	B	C	D
Uphill	Downhill	Uphill	Downhill

b)

A	B	C	D
Downhill	Uphill	Downhill	Uphill

c)

A	B	C	D
Downhill	Uphill	Uphill	Downhill

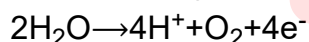
d)

A	B	C	D
Uphill	Downhill	Downhill	Uphill

180. In an experiment in which photosynthesis is performed during the day, you provide a plant with radioactive carbon dioxide ($^{14}\text{CO}_2$) as a metabolic tracer. The ^{14}C is incorporated first into oxaloacetic acid. The plant is best characterised as a

a) CAM plant b) insectivorous plant. c) C_4 plant d) C_3 plant

181. Refer to the given reaction.



Where does this reaction take place in the chloroplasts of plants?

a) Outer surface of thylakoid membrane b) Inner surface of thylakoid membrane

c) In the matrix (stroma) d) Intermembrane space

182. In leaves of C_4 plants, malic acid synthesis during CO_2 fixation occurs in

a) Bundle sheath b) Guard cells c) Epidermal cells d) Mesophyll cells

183. _____ is the process of synthesis of ATP from ADP and P_i in the presence of light.

a) Phosphorylation b) Photophosphorylation c) Photosystem

d) Oxidative phosphorylation

184. Warburg effect refers to

a) decreased photosynthetic rate at very high O_2 concentration

b) increased photosynthetic rate at very high O_2 concentration

- c) decreased photosynthetic rate at very low O_2 concentration
 d) increased photosynthetic rate at very low O_2 concentration.
185. Accessory photosynthetic pigments in most green plants are
 a) chlorophyll a b) chlorophyll b c) carotenoids and xanthophylls d) both (b) and (c).
186. Which one of the following is wrong in relation to photorespiration ?
 a) It is a characteristic of C_3 plants. b) It occurs in chloroplasts.
 c) It occurs in daytime only d) It is a characteristic of C_4 plants
187. Select the option which correctly depicts the functions of parts X, Y and Z.
- a)
- | | | |
|---------------|----------------|-------------------------|
| X | Y | Z |
| Dark reaction | Light reaction | Cytoplasmic inheritance |
- b)
- | | | |
|----------------|------------------------|----------------------|
| X | Y | Z |
| Light reaction | Carbohydrate synthesis | Carbohydrate storage |
- c)
- | | | |
|----------------|----------------------|------------------------|
| X | Y | Z |
| Light reaction | Carbohydrate storage | Carbohydrate synthesis |
- d)
- | | | |
|------------------------|----------------------|-------------------------|
| X | Y | Z |
| Carbohydrate synthesis | Carbohydrate storage | Cytoplasmic inheritance |
188. The correct sequence of cell organelles during photorespiration is _____
 a) Chloroplast-Golgi bodies-mitochondria
 b) Chloroplast-Rough Endoplasmic reticulum. Dictyosomes
 c) Chloroplast-peroxisome-mitochondria d) Chloroplast-vacuole-peroxisome
189. Consider following statements with respect to the C_4 pathway and select the correct ones.
 (i) Mesophyll cells possess both RuBisCO and PEP case enzymes.
 (ii) Initial CO_2 fixation occurs in mesophyll cells.
 (iii) Final CO_2 fixation occurs in bundle sheath cells.
 a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)
190. Breakdown of proton gradient developed during chemiosmosis leads to the release of
 a) oxygen b) water c) energy d) protons
191. Select the option that correctly identifies X, Y and Z.
- a)
- | | | |
|--------|-------|-----------------|
| X | Y | Z |
| Stroma | Grana | Chloroplast DNA |
- b)
- | | | |
|--------|-------|----------------|
| X | Y | Z |
| Stroma | Grana | Starch granule |
- c)
- | | | |
|-------|--------|----------------|
| X | Y | Z |
| Grana | Stroma | Starch granule |
- d)
- | | | |
|-------|--------|-----------------|
| X | Y | Z |
| Grana | Stroma | Chloroplast DNA |
192. Photosynthetic pigments found in the chloroplasts occur in _____.
 a) thylakoid membranes b) plastoglobules c) matrix d) chloroplast envelope
193. Chromatophores take part in _____

a) Growth b) Movement c) Respiration d) photosynthesis

194. In C_4 pathway the fixation of CO_2 by PEPCase occurs in

a) Palisade tissue b) Mesophyll c) Bundle sheath d) Guard cell

195. Which fractions of the visible spectrum of solar radiations are primarily absorbed by carotenoids of the higher plants?

a) Violet and blue b) Blue and green c) Green and red d) Red and violet

196. Following table summarises the differences between light reactions and dark reactions.

	Light reactions	Dark reactions
(i)	These are also called as biosynthetic phase	These are also called as photochemical
(ii)	These reactions occur over thylakoids.	These reactions occur in stroma of chloroplasts.
(iii)	These produce assimilatory power i.e; $NADPH_2$ and ATP	These consume $NADPH_2$ and ATP.
(iv)	These are directly dependent upon light.	These depend upon the products synthesised during light reactions

Which of the above pairs of differences is/are incorrect?

a) (i) and (iv) b) (iii) and (iv) c) (ii) only d) (i) only

197. In C_3 plants, the first stable product of photosynthesis during the dark reaction is _____

a) Malic acid b) Oxaloacetic acid c) 3-phosphoglyceric acid d) Phospho glyceraldehyde

198. CO_2 is accepted by RUBP in C_4 plants in

a) Mesophyll cells b) Bundle sheath cell c) Stomatal guard cells d) Epidermal cells

199. Ferredoxin is a constituent of _____

a) PS - I b) PS - II c) Hill reaction d) P_{680}

200. Select the correct statement regarding the first stable product formed in Hatch and Slack pathway in C_4 plants.

a)

Oxaloacetate is formed by carboxylation of phosphoenol pyruvate (PEP) in the bundle sheath cells.

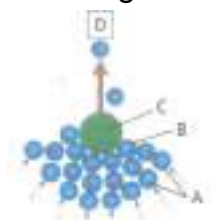
b)

Oxaloacetate is formed by carboxylation of phosphoenol pyruvate (PEP) in the mesophyll cells.

c) Phosphoglyceric acid is formed in the mesophyll cells.

d) Phosphoglyceric acid is formed in the bundle sheath cells.

201. Given figure depicts the light harvesting complex (LHC) of photosystem I (PS I).



Select the correct identification for A, B, C and D

a)

A	B	C	D
Core molecules	Antenna molecule	P ₆₈₀	Primary eacceptor

b)

A	B	C	D
Antenna molecules	Core molecule	P ₇₀₀	Primary e- acceptor

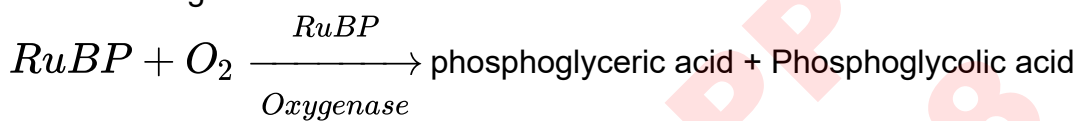
c)

A	B	C	D
Antenna molecules	Core	P ₇₀₀	Plastocyanin molecule

d)

A	B	C	D
Core molecules	Reaction center	P ₆₈₀	Plastocyanin

202. Refer to the given reaction



It is the first reaction of

a) C₃ pathway b) C₄ pathway c) C₂ pathway d) glycolysis

203. Who used prism, green alga *Cladophora* and aerobic bacteria and plotted the first action spectrum for photosynthesis?

a) Sachs b) Arnon c) Arnold d) Engelmann

204. A tadpole like configuration is found in

a) Chlorophyll b) Carotenoids c) Phycobilins d) Anthocyanin

205. Moll's half-leaf experiment proves that _____ is essential for photosynthesis to take place.

a) chlorophyll b) CO₂ c) light d) H₂O

206. Chlorophyll-a molecule at its carbon atom 3 of the pyrrole ring-II has one of the following _____

a) aldehyde group b) methyl group c) carboxyl group d) magnesium

207. If the total incident solar radiation the proportion of PAR is:

a) About 60% b) Less than 50% c) More than 80% d) About 70%

208. Which is not a step in Calvin cycle?

a) Carboxylation b) Glycolytic reversal c) Regeneration d) Photophosphorylation

209. What does the given diagram represent with respect to the various photosynthetic processes?



a) C₂ cycle b) Cyclic photophosphorylation c) Non-cyclic photophosphorylation
d) Z-scheme of phosphorylation

210. **Assertion:** The first product of CO_2 fixation in C_3 pathway is OAA.

Reason: The first product of CO_2 fixation in C_4 pathway is PGA.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

211. Given table shows the CO_2 compensation point and optimum CO_2 concentration for photosynthesis for C_3 and C_4 plants.

	C_3 plants	C_4 plants
CO_2 compensation point	25-100 ppm	A
Optimum CO_2 concentration	B	360 ppm

Select the correct values for A and B

a)

A	B
0-50 ppm	300 ppm

b)

A	B
0-10 ppm	450 ppm

c)

A	B
100-150 ppm	250 ppm

d)

A	B
100-110 ppm	290 ppm

212. Which one of the following pigments does not occur in the chloroplast?

a) Carotene b) Xanthophyll c) Chlorophyll 'b' d) Anthocyanin

213. If green plant cells are incubated with O^{18} - labelled water, which of the following molecules will become radioactive when the cells are exposed to light?

a) O_2 b) CO_2 c) H_2O d) Sugar

214. Which metal ion is a constituent of chlorophyll?

a) Iron b) Copper c) Magnesium d) Zinc

215. Which of the following photosynthetic bacteria have both PS-I & PS-II?

a) Purple sulphur bacteria b) Cyanobacteria c) Purple non sulphur bacteria
d) Green sulphur bacteria

216. Study the following statements.

(i) Red light falling in the range of wavelength 660-760 nm is the most effective for photosynthesis.

(ii) Green light falling in the range of wavelength 500-580 nm is the least effective for photosynthesis.

(iii) Chl a, chl b, carotenes and xanthophylls are soluble in organic solvents.

(iv) Phycobilins (phycocyanin, allophycocyanin and phycoerythrin) are soluble in water.

Which of the above statements is/are incorrect?

a) (ii) and (iii) b) (iii) and (iv) c) (i) only d) None of these

217. During chemiosmotic synthesis of ATP, protons diffuse through CF_0 channels that activates ATPase enzyme. As a result, one molecule of ATP is formed when _____ passes through ATPase.

a) 4H^+ b) H^+ c) 2H^+ d) 6H^+

218. Which technique has helped in investigation of Calvin cycle?

a) X-ray crystallography b) X-ray technique c) Radioactive isotope technique
d) Intermittent light

219. Photochemical phase does not include
a) light absorption b) water splitting and O_2 release c) ATP and NADPH formation
d) CO_2 fixation
220. Anoxygenic photosynthesis is characteristic of____
a) Rhodospirillum b) Spirogyra c) Chlamydomonas d) Ulva
221. **Assertion:** C_3 plants respond to increased CO_2 concentration by increasing rate of photosynthesis.
Reason: The higher productivity of some greenhouse crops such as tomatoes and bell pepper is due to increased CO_2 concentration.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
222. Which of the following factors, besides being one of the reactants in the process of photosynthesis, indirectly affects its rate?
a) Oxygen b) Carbon dioxide c) Water d) Chlorophyll
223. Yellowish colour of autumn foliage is due to the presence of a type of xanthophyll pigment called as
a) lutein b) lycopene c) fucoxanthin d) zeaxanthin
224. **Assertion:** The proton gradient is broken down due to the movement of protons across the membrane to stroma through the transmembrane channel of the F_0 of the ATPase.
Reason: The breakdown of proton gradient leads to release of energy.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
225. The oxygen evolved during photosynthesis comes from water molecules. Which one of the following pairs of elements is involved in this reaction?
a) Manganese and Potassium b) Magnesium and Molybdenum
c) Magnesium and Chlorine d) Manganese and Chlorine
226. During light reaction in photosynthesis the following are formed
a) ATP and sugar b) hydrogen, O_2 and sugar c) ATP, hydrogen donor and O_2
d) ATP, hydrogen and O_2 donor
227. Chemosynthetic bacteria obtain energy from
a) sun b) infra red ray c) organic chemicals. d) inorganic chemicals.
228. Stomatal movement is not affected by____
a) O_2 concentration b) Light c) Temperature d) CO_2 concentration
229. **Assertion:** The primary CO_2 acceptor in C_4 pathway is 3-carbon molecule phosphoenol pyruvate (PEP).
Reason: The enzyme responsible for this fixation is PEPcarboxylase or PEPcase.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
230. Read the given statements and select the correct option.
Statement 1: Crassulacean acid metabolism occurs in succulent plants which grow in xeric conditions.
Statement 2: Stomata are generally sunken in succulent plants.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
231. In sugarcane plant $^{14}\text{CO}_2$ is fixed in malic acid, in which the enzyme that fixes CO_2 is _____.
a) fructose phosphatase b) ribulose biphosphate carboxylase
c) Phosphoenol pyruvic acid carboxylase d) ribulose phosphate kinase
232. In a chloroplast the highest number of protons are found in _____.
a) stroma b) lumen of thylakoids c) inter membrane space d) antennae complex
233. Pigment acting as a reaction centre during photosynthesis is _____.
a) carotene b) phyochrome c) P_{700} d) cytochrome
234. The most common limiting factor for photosynthesis is
a) CO_2 b) O_2 c) H_2O d) Temperature
235. During photorespiration, the oxygen consuming reaction(s) occur in _____.
a) stroma of chloroplasts and peroxisomes b) grana of chloroplasts and peroxisomes
c) stroma of chloroplasts d) stroma of chloroplasts and mitochondria
236. The first acceptor of electrons from an excited chlorophyll molecule of photosystem II is _____.
a) iron-sulphur protein b) ferredoxin c) quinone d) cytochrome
237. **Assertion:** The stroma lamellae have both PS I and PS II
Reason: The grana lamellae lack PSII as well as NADP reductase enzyme.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
238. If green plant cells are incubated with O^{18} -labelled CO_2 , which of the following molecules will become radioactive when the cells are exposed to light?
a) ATP b) Water c) Sugar d) O_2
239. Who demonstrated that green plants purify the foul air produced by breathing animals and burning candles?
a) Priestley b) Ingenhousz c) Sachs d) Engelmann

240. Consider the above given figure and select the option that can be best concluded from it.



- a)
The action spectrum shows a graphic representation of amount of light of different wavelengths absorbed by a pigment.
- b)
Absorption spectrum depicts the relative rates of photosynthesis at different wavelengths of light.
- c) Action spectrum corresponds closely to absorption spectra of chl a. d) None of these
241. Which one occurs both during cyclic and non-cyclic modes of photophosphorylation?
a) Involvement of both PS-I and PS-II b) Formation of ATP c) Release of O_2
d) Formation of NADPH
242. Which one is a C_4 - plant?
a) Papaya b) Pea c) Potato d) Maize/Com
243. Which one of the following is represented by Calvin cycle?
a) Reductive carboxylation b) Oxidative carboxylation c) Photophosphorylation
d) Oxidative phosphorylation
244. Tropical plants have a _____ temperature optimum than the plants adapted to temperate climates.
a) lower b) equal c) higher d) none of these
245. The enzyme that is not found in a C_3 plant is
a) RuBP carboxylase b) PEP carboxylase c) NADP reductase d) ATP synthase.
246. The herbicide DCMU kills the weeds because it inhibits
a) respiration b) CO_2 fixation c) cell division d) NO_3^{2-} uptake
247. During C_2 cycle, there occurs
a) synthesis of sugars b) utilisation of ATP c) synthesis of ATP d) synthesis of NADPH.
248. Read the given statements and select the correct option.
Statement 1: In photosynthesis, during ATP synthesis, protons accumulate in the lumen of thylakoid.
Statement 2: In respiration, during ATP synthesis, protons accumulate in the intermembranal space of mitochondria.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect

249. During Z scheme, electrons excited by absorption of light in PSI are transferred to the primary acceptors, and therefore must be replaced. The replacements come directly from
- a) NADP b) ATP c) PS II d) water

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Time : 1 Mins

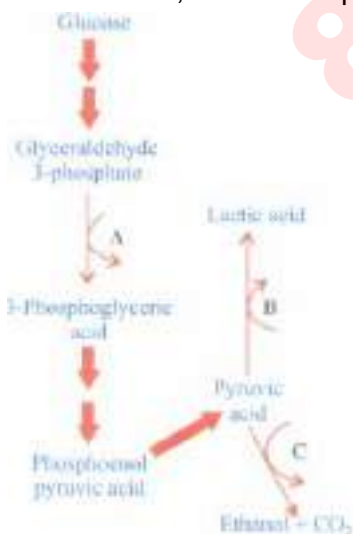
RESPIRATION OF PLANTS 1

Marks : 892

- RQ of fats and proteins is generally
a) 1 b) <1 c) >1 d) α
- Which of the following steps is associated with ATP formation (substrate level phosphorylation)?
a) Succinyl CoA \sim Succinic acid b) 1, 3 bisPGA \rightarrow 3 PGA c) PEP \rightarrow Pyruvate
d) All of these
- Number of multiprotein complexes involved in ETS and oxidative phosphorylation of mitochondria is
a) Three b) Four c) Five d) Six
- How many ATP molecules could maximally be generated from one molecule of glucose, if the complete oxidation of one mole of glucose to CO_2 and H_2O yields 686 Kcal and the useful chemical energy available in the high energy phosphate bond of one mole of ATP is 12 kcal?
a) Thirty b) Fifty-seven c) One d) Two
- Match the following and choose the correct option from those given below.

Column I	Column II
A. Molecular oxygen	i. α - ketoglutaric acid
B. Electron acceptor	ii. Hydrogen acceptor
C. Pyruvate dehydrogenase	iii. Cytochrome C
D. Decarboxylation	iv. Acetyl Co A

- a) A-ii, B-iii, C-iv, D-i b) A-iii, B-iv, C-ii, D-i c) A-ii, B-i, C-iii, D-iv d) A-iv, B-iii, C-i, D-ii
6. What does A, B and C depict in the given pathways of anaerobic respiration?



a)

A	B	C
$\text{NADH} + \text{H}^+ \rightarrow \text{NAD}^+$	$\text{NAD}^+ \rightarrow \text{NADH} + \text{H}^+$	$\text{NAD}^+ \rightarrow \text{NADH} + \text{H}^+$

b)

A	B	C
$\text{NADH} + \text{H}^+ \rightarrow \text{NAD}^+$	$\text{NADH} + \text{H}^+ \rightarrow \text{NADH} + \text{H}^+$	$\text{NAD}^+ \rightarrow \text{NADH} + \text{H}^+$

c)

A	B	C
$\text{NAD}^+ \rightarrow \text{NADH} + \text{H}^+$	$\text{NADH} + \text{H}^+ \rightarrow \text{NAD}^+$	$\text{NADH} + \text{H}^+ \rightarrow \text{NAD}^+$

d)

A	B	C
$\text{NAD}^+ \rightarrow \text{NADH} + \text{H}^+$	$\text{NADH} + \text{H}^+ \rightarrow \text{NAD}^+$	$\text{NAD}^+ \rightarrow \text{NADH} + \text{H}^+$

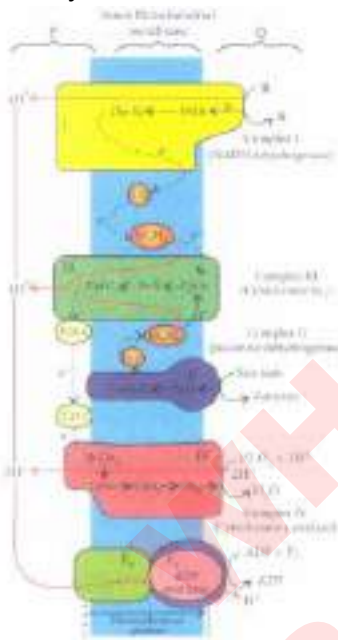
7. Which of the following conversions involve ATP synthesis during glycolysis?

a) Glucose \rightarrow Glucose - 6- phosphate

b) Fructose-6-phosphate \rightarrow Fructose-1,6-biphosphate

c) 1,3-bisphosphoglyceric acid (BPGA) \rightarrow 3-phosphoglyceric acid (PGA) d) All of these

8. Identify P, Q, R and S in the given diagram of electron transport system.



a)

P	Q	R	S
Matrix	Outer chamber	FMN	NADH_2

b)

P	Q	R	S
Inter-membrane space	Matrix	$\text{NADH} + \text{H}^+$	NAD^+

c)

P	Q	R	S
Inter-membran space	Cristae	NAD^+	$\text{NADH} + \text{H}^+$

d)

P	Q	R	S
Cristae	Outer chamber	$\text{NADH} + \text{H}^+$	NAD^+

9. The energy-releasing process in which the substrate is oxidised without an external electron acceptor is called_____ .

a) fermentation b) photorespiration c) aerobic respiration d) glycolysis

10. EMP can produce a total of_____

a) 6 ATP b) 8 ATP c) 24 ATP d) 38 ATP

11. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Fermentation is the incomplete oxidation of glucose into lactic acid or ethanol.

Reason: It takes place under anaerobic conditions in prokaryotes only.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

12. Value of RQ in succulents is

a) unity b) infinite c) less than unity d) zero

13. Oxidative phosphorylation is

a) Formation of ATP energy released from electrons removed during substrate oxidation

b) Formation of ATP by transfer of phosphate group from a substrate to ADP

c) Oxidation of phosphate group in ATP d) Addition of phosphate group to ATP

14. Which of the following is a 4-carbon compound?

a) Oxaloacetic acid b) Phosphoglyceric acid c) Ribulose biphosphate

d) Phosphoenol pyruvate

15. In the electron transport system present in the inner mitochondrial membrane complexes I and IV are respectively

a) NADH dehydrogenase and FADH_2 b) FADH_2 and NADH dehydrogenase

c) NADH dehydrogenase and cytochrome c oxidase complex

d) NADH dehydrogenase and ATP synthase

16. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: The metabolic pathway through which the electron passes from one carrier to another is called the electron transport system (ETS).

Reason: ETS is present in the inner mitochondrial membrane.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false

17. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Fats made of three fatty acid chains attached to glycerol	(i) Glycogen
B. Glycolysis metabolite made from glycerol	(ii) Glyceraldehyde
C. Storage form of glucose	(iii) Triglycerides
D. Common respiratory substrate of glycolysis	(iv) Glucose

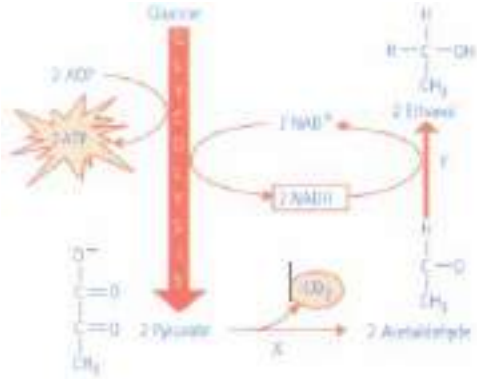
a) A-(iv), B-(ii), C-(i), D-(iii) b) A-(iii), B-(ii), C-(i), D-(iv) c) A-(iv), B-(iii), C-(i), D-(ii)

d) A-(i), B-(ii), C-(iii), D-(iv)

18. Which of the following is link between carbohydrate and fat metabolism?

a) CO_2 b) Acetyl Co-A c) Pyruvic acid d) Citric acid

19. Select the incorrect statement with respect to the given representation



a) X is the enzyme pyruvate decarboxylase and Y is the enzyme alcohol dehydrogenase.

b)

This process is involved in brewing industry for producing beverages like beer, rum, whisky, etc.

c)

Accumulation of the end product (i.e., ethanol) during this process, in a culture of yeast, stops the multiplication of yeast cells and may even lead to death of cells.

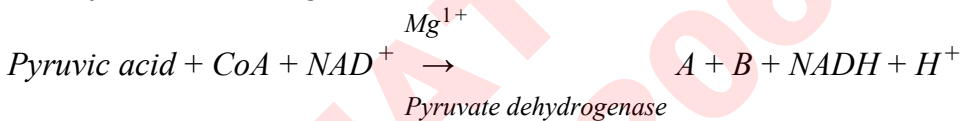
d) None of these

20. Pyruvate dehydrogenase complex is used in converting-

a) Pyruvate to glucose b) Glucose to pyruvate c) Pyruvic acid to lactic acid

d) Pyruvate to acetyl Co-A

21. Identify A and B in the given reaction.



a)

A	B
PEP	CO ₂

b)

A	B
Acetyl CoA	CO ₂

c)

A	B
CO ₂	H ₂ O

d)

A	B
Acetyl CoA	H ₂ O

22. Phytochrome is a _____

a) flavoprotein b) glycoprotein c) lipoprotein d) chromoprotein

23. End product of citric acid/Krebs' cycle is _____

a) citric acid b) lactic acid c) pyruvic acid d) CO₂+H₂O

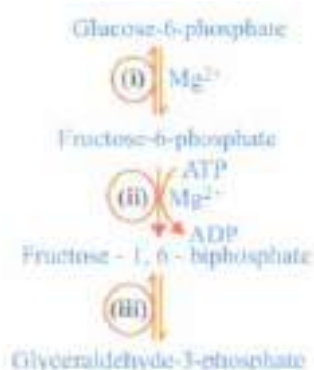
24. RQ in anaerobic respiration is

a) 0.7 b) 0.9 c) unity d) infinity.

25. Curing of tea leaves is brought by the activity of -

a) viruses b) fungi c) bacteria d) mycorrhiza

26. Study the given steps of glycolysis and identify the enzymes (i), (ii) and (iii) responsible for carrying out these steps.



a)

(i)	(ii)	(iii)
Phosphohexose isomerase	Phospho fructokinase	Aldolase

b)

(i)	(ii)	(iii)
Hexokinase	Phospho fructokinase	Aldolase

c)

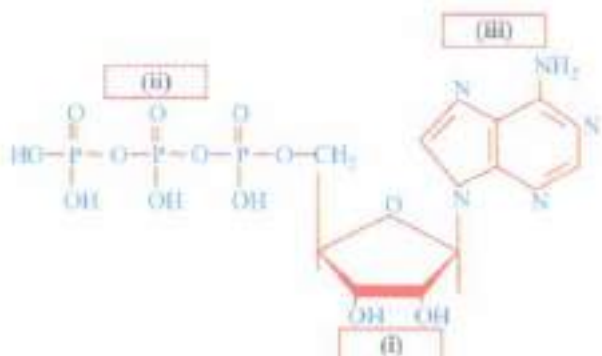
(i)	(ii)	(iii)
Phosphohexose isomerase	Hexokinase	Phospho fructokinase

d)

(i)	(ii)	(iii)
Aldolase	Phospho fructokinase	Phosphohexose isomerase

27. The respiration in germinating seeds produces energy which can be detected in the form of
a) water b) heat c) oxygen d) CO₂
28. Chemiosmotic theory of ATP synthesis in the chloroplasts and mitochondria is based on_____
a) membrane potential b) accumulation of Na ions c) accumulation of K ions
d) proton gradient
29. Which of the following statements is correct with respect to the effect of temperature on rate of respiration?
a) Rate of respiration increases with an increase in temperature from 0°C to 30°C.
b)
Rate of respiration doubles for every 10°C rise in temperature, thus temperature co-efficient (Q₁₀) for respiration is 2.
c)
At very high temperatures such as 500°C or more, rate of respiration decreases due to enzymatic degradation.
d) All of these
30. Total yield in one Krebs cycle:
a) 3FADH₂, 2NADH₂, 1ATP b) 2FADH₂, 2NADH₂, 2ATP c) 2NADH₂, 1FADH₂, 2ATP
d) 3NADH₂, 1FADH₂, 1ATP
31. Respirometer is an instrument used to measure
a) rate of respiration b) respiratory quotient c) both of these d) none of these.
32. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is formed because_____
a) high energy bonds are formed in mitochondrial proteins
b) ADP is pumped out of the matrix into the intermembrane space
c) a proton gradient forms across the inner membrane
d)
there is a change in the permeability of the inner mitochondrial membrane toward adenosine diphosphate (ADP)'.
33. Link between glycolysis, Krebs' cycle and β -oxidation of fatty acid or carbohydrate and fat metabolism is _____.
a) oxaloacetic acid b) succinic acid c) citric acid d) acetyl Co-A
34. The germinating seeds fatty acids are degraded exclusively in the
a) Peroxisomes b) Mitochondria c) Proplastids d) Glyoxysomes
35. In glycolysis, during oxidation electrons are removed by_____
a) ATP b) glyceraldehyde-3-phosphate c) NAD⁺ d) molecular oxygen

36. Identify the three components [(i), (ii) and (iii)] of ATP molecule shown in the given figure.



a)

(i)	(ii)	(iii)
Ribose	Triphosphate group	Adenine

b)

(i)	(ii)	(iii)
Adenine	Triphosphate group	Ribose

c)

(i)	(ii)	(iii)
Glucose	Triphosphate group	Adenine

d)

(i)	(ii)	(iii)
Ribose	Triphosphate group	Guanine

37. In which one of the following processes CO_2 is not released?

- a) Aerobic respiration in plants b) Aerobic respiration in animals c) Alcoholic fermentation
d) Lactate fermentation

38. Identify the correct terms for the given statements and select the correct answer

- (i) Sudden increase in the rate of respiration during ripening of fruits.
(ii) Reduction in the consumption of respiratory substrate when mode of respiration is changed from anaerobic to aerobic.
(iii) Respiratory oxidation of carbohydrates and fats.

a)

Pasteur effect	Floating respiration	Climacteric respiration
(i)	(ii)	(iii)

b)

Pasteur effect	Floating respiration	Climacteric respiration
(ii)	(iii)	(i)

c)

Pasteur effect	Floating respiration	Climacteric respiration
(iii)	(ii)	(i)

d)

Pasteur effect	Floating respiration	Climacteric respiration
(ii)	(i)	(iii)

39. Enzyme of cytochrome oxidase can be inhibited by:

- a) Iodo acetate b) Azides & cyanides c) Oligomycins d) Dinitrophenol

40. Fermentation is represented by the equation

- a) $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 6\text{O}_2 + 6\text{H}_2\text{O} + 686 \text{ kcal}$ b) $\text{C}_6\text{H}_{12}\text{O}_6 \xrightarrow{\text{Light}} 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2 + 59 \text{ kcal}$
c) $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O} + 6\text{O}_2$ d) $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

41. How many ATP will be produced during the production of 1 molecule of Acetyl Co-A from 1 molecule of pyruvic acid?

- a) 3 ATP b) 5 ATP c) 8 ATP d) 38 ATP

42. A test tube containing molasses solution and yeast is kept in a warm place overnight. The gas collected from this mixture
- a) extinguishes the flame b) bursts into flame when ignited c) turns lime water milky
d) both (a) and (c).
43. What is the role of NAD⁺ in cellular respiration?
- a) It is a nucleotide source for ATP synthesis b) It functions as an electron carrier
c) It functions as an enzyme d) It is the final electron acceptor for anaerobic respiration
44. Which of the following options does not hold good regarding anaerobic respiration or fermentation?
- a) Occurs inside the mitochondria b) Partial breakdown of glucose occurs
c) Net gain of only 2 ATP molecules d) None of these
45. Select the wrong statement.
- a)
Oxidative decarboxylation of pyruvic acid requires the presence of enzyme pyruvate dehydrogenase.
- b) All living cells whether aerobic or anaerobic, perform glycolysis.
- c) Cyanide does not stop chemiosmosis.
- d) Respiratory chain uses O₂ as final hydrogen acceptor.
46. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** Glycolysis is also called EMP pathway
Reason: It is the only process of respiration in aerobic organisms
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
47. In glycolysis net gain of ATP directly is
- a) 2 ATP b) 6 ATP c) 8 ATP d) 1 ATP
48. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. TCA cycle	(i) Inner mitochondrial membrane
B. F ₀ - F ₁ particles	(ii) Hans Krebs
C. End product of glycolysis	(iii) Oxidative decarboxylation
D. Pyruvate dehydrogenase	(iv) Pyruvic acid

- a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(i), B-(ii), C-(iv), D-(iii) c) A-(ii), B-(iii), C-(iv), D-(i)
d) A-(iii), B-(ii), C-(i), D-(iv)
49. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
- Assertion:** Anaerobic respiration sometimes occurs in our skeletal muscles during strenuous exercise.
Reason: Pyruvic acid is reduced to lactic acid by lactate dehydrogenase in the absence of oxygen
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion

- c) If assertion is true but reason is false d) If both assertion and reason are false

50. Krebs' cycle is also called metabolic sink as it is a common pathway for:

- a) carbohydrates, fats and proteins (amino acids) b) carbohydrates and fats only
c) carbohydrates and organic acids only d) proteins and fats only

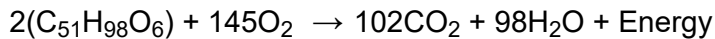
51. Fermentation is anaerobic production of _____

- a) protein and acetic acid b) alcohol, lactic acid or similar compounds
c) ethers and acetones d) alcohol and lipoproteins

52. An organic substance bound to an enzyme and essential for its activity is called

- a) Apoenzyme b) Isoenzyme c) Coenzyme d) Holoenzyme

53. Refer the given equation.



The RQ in this case is:

- a) 1 b) 0.7 c) 1.45 d) 1.62

54. Which statement is wrong for Krebs' cycle?

- a) There are three point in the cycle where NAD^+ is reduced to $\text{NADH} + \text{H}^+$
b) There is one point in the cycle where FAD^+ is reduced to FADH_2
c) During conversion of succinyl CoA to succine acid, a molecule of GTP is synthesised
d)

The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid

55. Read the given statements and select the correct option.

Statement 1: Glycolysis occurs in mitochondrial matrix.

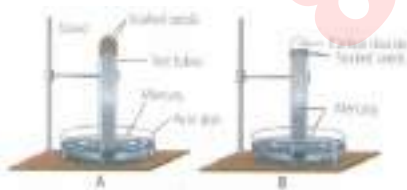
Statement 2: Krebs' cycle occurs on cristae of mitochondria.

- a) Both statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 incorrect.
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect

56. When one glucose molecule is completely oxidised, it changes _____

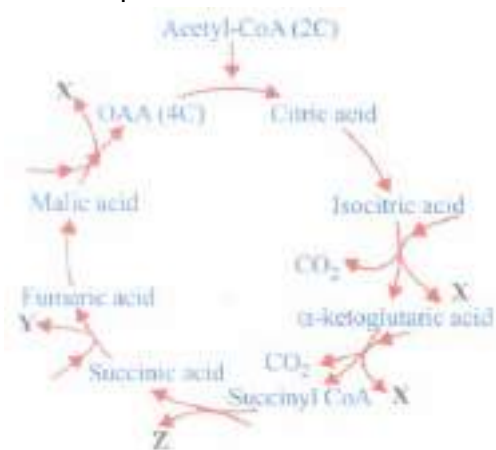
- a) 36 ADP molecules into 36 ATP molecules b) 38 ADP molecules into 38 ATP molecules
c) 30 ADP molecules into 30 ATP molecules d) 32 ADP molecules into 32 ATP molecules

57. The given experimental set-up demonstrates



- a) photosynthesis b) aerobic respiration c) anaerobic respiration d) ascent of sap

58. Identify X, Y and Z in the given diagram representing steps of citric acid cycle and select the correct option.



a)

X	Y	Z
GTP	NADH ₂	FADH ₂

b)

X	Y	Z
FADH ₂	NADH ₂	GTP

c)

X	Y	Z
NADH ₂	FADH ₂	GTP

d)

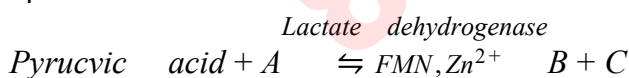
X	Y	Z
CO ₂	NADH ₂	ADP

59. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Oxidation of one molecule of NADH gives rise to 3 molecules of ATP and that of one molecule of FADH₂ produces 2 molecules of ATP.

Reason: The number of ATP molecules synthesised depends on the nature of the electron donor.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false
60. In alcoholic fermentation _____
 a) oxygen is the electron acceptor.
 b) triose phosphate is the electron donor while acetaldehyde is the electron acceptor.
 c) triose phosphate is the electron donor while pyruvic acid is the electron acceptor.
 d) there is no electron donor
61. Identify A, B and C in the given reaction of lactic acid fermentation and select the correct option.



a)

A	B	C
NADH	Lactic acid + CO ₂	NAD ⁺

b)

A	B	C
NADH	Lactic acid	NAD ⁺

c)

A	B	C
NAD ⁺	Lactic acid	NADH

d)

A	B	C
NAD ⁺	Lactic acid + CO ₂	NADH

62. Percentage of energy in glucose released by both lactic acid and alcoholic fermentation is
 a) 5-10% b) Less than 7% c) More than 13% d) 45%
63. What is true about the end products of glycolysis?
 a) 2 pyruvic acid + 2ATP + 2NADH₂ b) 2 pyruvic acid + 2NADH₂
 c) 1 pyruvic acid + 2ATP + 2NADH₂ d) 2 pyruvic acid + 1ATP + 1NADH₂
64. Which of the following an intermediate in Kerbs cycle?
 a) Axetic acid b) Succeinyl conezyme-A c) Mallic acid d) Citric acid

65. Fermentation products of yeast are _____
 a) $\text{H}_2\text{O} + \text{CO}_2$ b) methyl alcohol + CO_2 c) methyl alcohol + H_2O d) ethyl alcohol + CO_2
66. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: During aerobic respiration, pyruvic acid formed as a result of glycolysis, undergoes phosphorylation reaction to form acetyl CoA.
Reason: There is net gain of 18 ATP molecules during aerobic respiration of one molecule of glucose.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false.
67. At the end of glycolysis, X is the net energy gain from one molecule of glucose via Y, but there is also energy stored in the form of Z. Identify X, Y and Z.
- a)
- | X | Y | Z |
|-------|---------------------------|----------------------------|
| 1 ATP | Oxidative phosphorylation | $\text{NADH} + \text{H}^+$ |
- b)
- | X | Y | Z |
|--------|---------------------------|----------------------------|
| 2 ATPs | Oxidative phosphorylation | $\text{NADH} + \text{H}^+$ |
- c)
- | X | Y | Z |
|-------|---------------------------------|-----------------|
| 1 ATP | Substrate level phosphorylation | FADH_2 |
- d)
- | X | Y | Z |
|--------|---------------------------------|----------------------------|
| 2 ATPs | Substrate level phosphorylation | $\text{NADH} + \text{H}^+$ |
68. How many ATP molecules will be generated in a plant system during complete oxidation of 40 molecules of glucose?
 a) 180 b) 360 c) 1440 d) 3040
69. Alternate name of Krebs' cycle is
 a) TCA cycle b) citric acid cycle c) both (a) and (b) d) none of these.
70. Select the correct statement.
 a) When ATP is synthesised directly from metabolites, it is substrate level phosphorylation.
 b) In Krebs' cycle, citrate undergoes 2 decarboxylations and 4 dehydrogenations.
 c) Krebs' cycle is an amphibolic process d) All of these
71. Instantaneous source of energy is
 a) proteins b) fats c) nucleic acids d) glucose.
72. The essential chemical components of many coenzymes are:
 a) Vitamins b) Proteins c) Nucleic acids d) Carbohydrates
73. Last e^- acceptor during ETS is
 a) O_2 b) cyt a c) cyt a_2 d) cyt a_3
74. Consider the first reaction of TCA cycle
-
- What is true about compound A?
 a) First product of TCA cycle b) Tricarboxylic acid and six carbon compound
 c) It undergoes reorganisation in the presence of enzyme aconitase to form cis-aconitate
 d) All of these
75. During complete metabolism of glucose, the number of ATP formed is:

- a) 2 b) 12 c) 36 d) 44

76. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

Assertion: This conversion of 1, 3-bisphosphoglycerate (BPGA) to 3-phosphoglyceric acid (PGA) is an energy yielding step.

Reason: This energy is trapped by the formation of ATP.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

77. The bacterium (*Clostridium botulinum*) that causes botulism is _____

- a) an obligate anaerobe b) an facultative aerobe c) an obligate aerobe
d) a facultative anaerobe

78. The mechanism of ATP formation both in chloroplast and mitochondria is explained by _____

- a) relay pump theory of Godlewski b) Munch's pressure/mass flow model
c) chemiosmotic theory of Mitchell d) Cholondy-Went's model

79. The net gain of ATP molecules in glycolysis during aerobic respiration is

- a) 0 b) 2 c) 4 d) 8

80. Aerobic respiratory pathway is appropriately termed _____

- a) parabolic b) amphibolic c) anabolic d) catabolic

81. Which complex contains cytochromes a and a_3 and two copper centres?

- a) NADH dehydrogenase complex b) FADH reductase c) Cytochrome bc_1 complex
d) Cytochrome c oxidase complex

82. In most eukaryotic cells, number of ATP net generated from one glucose molecule is

- a) 38 b) 36 c) 34 d) 32

83. Refer to the following flow chart representing the cellular respiration and its fuels. Blanks 1, 2, 3, 4, 5, 6 and 7 are respectively



- a) amino acids, carbohydrate, glucose, fats, glycerol, fatty acid, acetyl Co-A
b) fats, acetyl Co-A, amino acid, fatty acid, carbohydrate, glycerol, glucose
c) fatty acid, glucose, acetyl Co-A, glycerol, fats, carbohydrate, amino acid
d) carbohydrate, fats, glycerol, fatty acids, amino acid, glucose, acetyl Co-A.

84. Sequence of food materials consumed during respiration is:

- a) Firstly → carbohydrate → fats → proteins b) Carbohydrate → proteins → fats
c) Proteins → fats → carbohydrate d) Fats → proteins → carbohydrate

85. Which of these statements is incorrect ?

- a) Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms
b) Glycolysis occurs in cytosol

- c) Enzymes of TCA cycle are present in mitochondrial matrix
d) Oxidative phosphorylation takes place in outer mitochondrial membrane
86. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is form because:
a) A proton gradient forms across the inner membrane
b)
There is a change in the permeability of the inner mitochondrial membrane toward adenosine diphosphate (ADP)
c) High energy bonds are formed in mitochondrial proteins
d) ADP is pumped out of the matrix into the intermembrane space
87. Net gain of ATP molecules during aerobic respiration is _____.
a) 36 molecules b) 38 molecules c) 40 molecules d) 48 molecules
88. Study the incorrect statement with respect to an overview of the electron transport system (ETS).
a)
Ubiquinone receives reducing equivalents vie., FADH_2 (complex II) that is generated during oxidation of succinate in the TCA cycle.
b) As the electrons move down the system, energy is released and used to form ATP
c)
2ATPs are formed for every pair of electrons that enters by way of NADH and 3ATPs are formed for every pair of electrons that enters by way of FADH_2
d) Oxygen, the final e acceptor becomes a part of water.
89. ATP is injected in cyanide poisoning because it is _____.
a) necessary for cellular functions b) necessary for $\text{Na}^+ - \text{K}^+$ pump
c) $\text{Na}^+ - \text{K}^+$ pump operates at the cell membranes d) ATP breaks down cyanide
90. Identify enzyme A in the given reaction of Krebs' cycle.
- $$\text{OAA}(4\text{C}) + \text{Acetyl} - \text{CoA} + \text{H}_2\text{O} \xrightarrow{\text{A}} \text{Citric acid}(6\text{C}) + \text{CoA}$$
- a) Oxaloacetate synthetase b) Citrate synthase c) Aconitase d) Dehydrogenase
91. During electron transport system (ETS), electron transport proceeds from carriers that have _____ redox potential to those having _____ redox potential. This electron transport down the energy gradient leads to the formation of ATP from ADP and P_i , which is referred to as _____.
a) low, high, oxidative phosphorylation b) low, high, oxidative decarboxylation
c) high, low, oxidative phosphorylation d) high, low, oxidative decarboxylation
92. In addition to the normal process of oxidation of carbohydrates through glycolysis and Krebs' cycle, there is another process by which plants could oxidise carbohydrates to obtain energy. In this process, hexose sugars undergo oxidative degradation through 5-C sugar intermediates and hence it is known as Pentose phosphate pathway (PPP). Which of the following statements is not true with regard to PPP?
a) It is an alternative to glycolysis and also acts as a safety valve or shunt to glycolysis
b)
It is common in plants and occurs in certain specialised tissues of animal body, e.g., liver, adipose tissue, testes, ovary, adrenal cortex, lactating mammary gland, eye lens and cornea.

- c) It occurs only in cytoplasm but not in any cell organelle.
 d) It is also called as hexose monophosphate shunt (HMP pathway).

93. Pyruvate dehydrogenase is used in converting

- a) glucose to pyruvate b) pyruvic acid to lactic acid c) pyruvate to acetyl CoA
 d) pyruvate to glucose

94. Krebs' cycle starts with the formation of a six carbon compound by reaction between

- a) fumaric acid and pyruvic acid b) OAA and acetyl CoA c) malic acid and acetyl CoA
 d) succinic acid and pyruvic acid

95. Though vertebrates are aerobes, but their ____ (i) ____ show anaerobic respiration during ____ (ii) _____. During this, ____ (iii) ____ of skeletal muscle fibres is broken down to release lactic acid and energy. Lactic acid, if accumulates causes muscle fatigue. Fill up the blanks in the above paragraph and select the correct option

a)

(i)	(ii)	(iii)
skeletal muscles	heavy exercise	glucose+

b)

(i)	(ii)	(iii)
skeletal muscles	mild exercise	glycogen

c)

(i)	(ii)	(iii)
skeletal muscles	heavy exercise	glycogen

d)

(i)	(ii)	(iii)
cardiac muscles	heavy exercise	glycogen

96. Incomplete oxidation of glucose into pyruvic acid with several intermediate steps is known as ____

- a) TCA-pathway b) glycolysis c) HMS-pathway d) Krebs' cycle

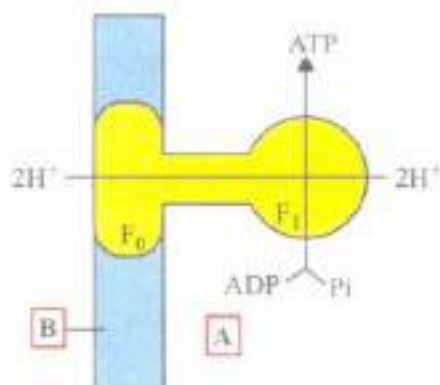
97. Mercury (Hg) is generally used in anaerobic respiration experiments because it does not react with _____

- a) O_2 b) CO_2 c) H_2O d) air

98. Study the following statements regarding chemiosmotic hypothesis in mitochondria and select the correct ones.

- (i) F_1 headpiece contains the site for the synthesis of ATP from ADP + P_i .
 (ii) F_0 part forms the channel through which protons cross the inner membrane.
 (iii) For each ATP produced, 2W pass through F_0 from the intermembrane space to the matrix down the electrochemical proton gradient.
 a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

99. Identify A and B in the given diagram showing ATP synthesis in mitochondria.



A = Mitochondrial matrix

A = Mitochondrial matrix

a) B = Outer mitochondrial membrane

b) B = Inner mitochondrial membrane

A = Cell cytoplasm

A = Cell cytoplasm

c) B = Inner mitochondrial membrane

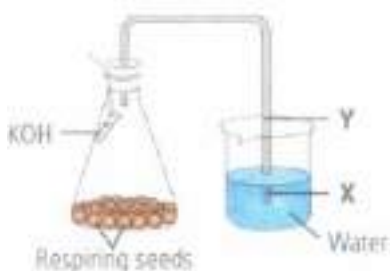
d) B = Outer mitochondrial membrane

100. Which of the following is essential for conversion of pyruvic acid into acetyl Co-A?

- a) LAA b) NAD⁺ c) TPP d) All of these
101. Which of the following steps of respiration is amphibolic?
 a) Glycolysis b) Oxidative decarboxylation of pyruvate c) TCA cycle
 d) Oxidative phosphorylation
102. Which component of ETS is mobile, e⁻ carrier?
 a) UQ(CO-Q) b) Cyto a c) Cyto-b d) Cyto-f
103. Which of the following statements regarding metabolic pathways is incorrect?
 a) Many of the steps of glycolysis can run in reverse
 b) Starch, sucrose or glycogen must be hydrolysed before it can enter the glycolysis
 c) After fats are digested, glycerol enters glycolysis by forming DHAP.
 d) After fat digestion, fatty acids can no longer participate in cellular respiration.
104. Respiratory quotient (RQ) for fatty acid is ____
 a) > 1 b) < 1 c) 1 d) 0
105. Amount of energy released during hydrolysis of a high energy bond of ATP is
 a) 73 kcal mol⁻¹ b) 0.73 kcal mol⁻¹ c) 3.4 kcal mol⁻¹ d) 7.3 kcal mol⁻¹
106. Number of oxygen atoms required for aerobic oxidation of one pyruvate-
 a) 5 b) 8 c) 10 d) 12
107. The following is required both by the process of respiration and photosynthesis
 a) Carbohydrates b) Sunlight c) Chlorophyll d) Cytochromes
108. In Krebs' cycle, OAA accepts acetyl CoA to form
 a) citric acid b) oxalosuccinate c) fumarate d) succinyl CoA
109. The balance sheet for ATP production in glycolysis has been given below. Select the option which correctly fills up the blanks for P, Q, R and S. ['X' stands for 'nil'].
- | | Steps | ATP Utilisation | ATP Production |
|----|---|-----------------|----------------|
| 1. | Glucose → Glucose-6-phosphate | P | X |
| 2. | Fructose-6-phosphate → Fructose-1, 6-bisphosphate | 1 | Q |
| 3. | 1, 3-bisphosphoglyceric acid → 3-Phosphoglyceric acid | X | R |
| 4. | 2-Phosphoenol pyruvic acid → Pyruvic acid | S | 2 |
- a) b) c) d)
- | | | | |
|-------|------|------|------|
| PQRS | PQRS | PQRS | PQRS |
| 1X X2 | 1X2X | 21X1 | X12X |
110. Which of these are respiratory poisons or inhibitors of ETC?
 a) Cyanides b) Antimycin A c) Carbon monoxide d) All of these
111. NADP⁺ is reduced to NADPH in _____.
 a) HMP b) Calvin cycle c) glycolysis d) EMP
112. Dough kept overnight in warm weather becomes soft and spongy due to
 a) absorption of CO₂ from atmosphere b) imbibition c) fermentation d) fermentation
113. Number of total ATP generated through TCA cycle per pyruvic acid molecule is
 a) 10 b) 12 c) 14 d) 24
114. Substrate level phosphorylation (GTP synthesis) occurs during conversion of
 a) OAA to citric acid b) Citric acid to isocitrate c) α-ketoglutaric acid to succinyl Co-A
 d) Succinyl Co-A to succinic acid
115. Select the incorrectly matched pair

- a) End products of alcoholic fermentation - Ethanol + CO₂
b) End products of lactic acid fermentation - Lactic acid + CO₂ c) Glycolysis - Cytoplasm
d) Key product of glycolysis - Pyruvic acid
116. The number of ATP molecules produced by electron transport system from kreb's cycle intermediates in a single turn is
a) 11 b) 14 c) 12 d) 16
117. Complete the following biochemical equation of respiration and select the correct answer
$$C_6H_{12}O_6 + 6O_2 \longrightarrow \boxed{} + \boxed{} + \boxed{}$$

a) 6CO₂ + 12Hp + Energy b) 12CO₂ + 4H₂O + Energy c) 12CO₂ + 6H₂O + Energy
d) 6CO₂ + 6H₂O + Energy
118. Name the enzyme responsible for oxidative decarboxylation during aerobic respiration.
a) Pyruvate dehydrogenase b) Succinate dehydrogenase c) Pyruvate kinase
d) Citrate synthase
119. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: Complex II and complex III of ETS are NADH dehydrogenase and cytochrome oxidase complex respectively.
Reason: Cytochrome c acts as a mobile carrier for transfer of electrons between complex II and III
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
120. Kerbs cycle begins with the reaction :
a) Citric acid + Acetyl CO-A b) Oxalacetic acid + Pyruvic acid
c) Oxalacetic acid + Citric acid d) Oxaloacetate + Acetyl acid
121. During which stage in the complete oxidation of glucose are the greatest nuxber of ATP molecules formed from ADP _____
a) glycolysis b) krebs cycle c) conversion of pynrvic acid to acetyl CoA
d) electron transport chain
122. Oxidation of one NADH and one FADH₂ respectively gives rise to _____ and _____ ATP molecules.
a) 3 and 2 b) 2 and 1 c) 2 and 3 d) 1 and 1
123. Rise in the water level from X to Y in the given experimental set-up demonstrates



- a) aerobic respirat b) anaerobic respiration c) photosynthesis d) transpiration pull
124. Which one of the following is the first step of gloyclysis?
a) Breakdown of glucose b) Phosphorlyation of glucose
c) Conversion of glucose into fructose d) Dehydrogenation of glucose
125. In which one of the following processes, carbon dioxide is not released?

- a) Aerobic respiration in animals b) Alcoholic fermentation c) Lactate fermentation
d) Aerobic respiration in plants

126. Which step is called gateway step/link reaction in aerobic respiration?

- a) Glycolysis b) Formation of acetyl coenzymeA c) Citric acid formation
d) ETS terminal oxidation

127. Select the option that correctly fills the blanks in the following statements.

A. Glucose has _____.(i)_____ carbon atoms, pyruvic acid has _____.(ii)_____ carbon atoms and the acetyl group has _____.(iii)_____ carbon atoms.

B. Electrons enter the electron transport system as parts of hydrogen atoms attached to _____.(i)_____ and _____.(ii)_____.

a)

A	B
(i)-6, (ii)-4, (iii)-3	(i)-NADH, (ii)-FADH ₂

b)

A	B
(i)-6, (ii)-3, (iii)-2	(i)-NADH, (ii)-FADH ₂

c)

A	B
(i)-6, (ii)-3, (iii)-2	(i)-ATP, (ii)-GTP

d)

A	B
(i)-6, (ii)-4, (iii)-3	(i)-ATP, (ii)-GTP

128. Which of the following describes significance of fermentation?

- (i) Production of alcohol in brewing industry
(ii) Making of dough in baking industry
(iii) Curing of tea and tobacco
(iv) Production of vinegar by acetic acid bacteria
a) (i), (ii) and (iii) b) (i), (ii) and (iv) c) (ii), (iii) and (iv) d) (i), (ii), (iii) and (iv)

129. In germinating seeds fatty acids are degraded exclusively in the _____

- a) proplastids b) glyoxysomes c) peroxisomes d) mitochondria

130. When two molecules of acetyl CoA enter the TCA cycle, net gain at the end of the cycle is

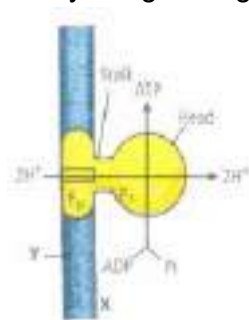
- a) 2NADH₂ + 2FADH₂ + 1GTP b) 3NADH₂ + 2FADH₂ + 2GTP
c) 6NADH₂ + 2FADH₂ + 2GTP d) 3NADH₂ + 1FADH₂ + 4GTP

131. Match the following and choose the correct option from those given below.

	Column A	Column B
A.	Molecular oxygen	i. α-ketoglutaric acid
B.	Electron acceptor	ii. H drogen acceptor
C.	Pyvate dehydrogenase	iii. Cytochrome C
D.	Decarboxylation	iv. Acetyl Co A

- a) A-ii, B-iii, C-iv, D-i b) A-iii, B-iv, C-ii, D-i c) A-ii, B-i, C-iii, D-iv d) A-iv, B-iii, C-i, D-ii

132. Study the given figure and select the incorrect option regarding this.



a)

The figure represents chemiosmotic ATP synthesis by oxysomes where X is the mitochondrial matrix and Y is the inner mitochondrial membrane

b)

Enzyme required for ATP synthesis is ATP synthase, considered to be the complex-V of ETS.

c)

The figure represents oxidative phosphorylation which is the synthesis of energy rich ATP molecules with the help of energy liberated during oxidation of reduced co-enzymes (NADH, FADH₂) produced in respiration.

d)

ATP synthase becomes active only when there is a proton gradient having higher concentration of protons (W) on the inner side (F₁ side) as compared to the outer side (F₀ side).

133. Which one of the following statements is incorrect?

a) In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme

b)

The competitive inhibitor does not affect the rate of breakdown of the enzyme for the substrate.

c)

The presence of the competitive inhibitor decreases the K_M of the enzyme of the substrate

d)

A competitive inhibitor reacts reversibly with the enzyme to form an enzyme-inhibitor complex.

134. Select the correct combination of the respiratory substrates and their respective RQs.

a)

Organic acids	Fats	Succulents
1.3	0.7	Zero

b)

Organic acids	Fats	Succulents
Infinity	0.7	Zero

c)

Organic acids	Fats	Succulents
Zero	1.3	0.7

d)

Organic acids	Fats	Succulents
Zero	0.7	1.3

135. Krebs' cycle occurs in _____.

a) mitochondria b) cytoplasm c) chloroplast d) ribosomes

136. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Plants have no specialised respiratory organs.

Reason: There is very little transport of gases from one plant part to another

a) If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

137. Read the given statements and select the correct option.

Statement 1: During photophosphorylation (of photosynthesis), light energy is utilised for the production of proton gradient during ATP synthesis.

Statement 2: In respiration, energy of oxidation-reduction is utilised for the phosphorylation and thus the process is called oxidative phosphorylation.

- a) Both statements 1 and 2 are correct
 b) Statement 1 is correct but statement 2 is incorrect
 c) Statement 1 is incorrect but statement 2 is correct.
 d) Both statements 1 and 2 are incorrect
138. In mitochondria, protons accumulate in
 a) Outer membrane b) Intermembrane space c) Inner membrane d) Matrix
139. Which of the metabolites is common to respiration mediated breakdown of fats, carbohydrates and proteins?
 a) Fructose 1, 6- biphosphate b) Pyruvic acid c) Acetyl CoA
 d) Glucose - 6 - phosphate
140. In Krebs' cycle FAD participates as electron acceptor during the conversion of _____
 a) succinyl Co-A to succinic acid b) α -ketoglutarate to succinyl Co-A
 c) succinic acid to fumaric acid d) fumaric acid to malic acid
141. All of the following processes can release CO_2 except
 a) alcoholic fermentation b) oxidative decarboxylation and Krebs' cycle
 c) oxidative phosphorylation d) conversion of α -ketoglutaric acid to succinic acid.
142. Categorise the given equations under respective phases and select the correct option.
 (i) $\text{C}_6\text{H}_{12}\text{O}_6 + 2\text{NAD}^+ + 2\text{ADP} + 2\text{P}_i \rightarrow 2\text{C}_3\text{H}_4\text{O}_3 + 2\text{ATP} + 2\text{NADH} + 2\text{H}^+$
 (ii)
 $\text{Pyruvic acid} + 4\text{NAD}^+ + \text{FAD}^+ + 2\text{H}_2\text{O} + \text{ADP} + \text{P}_i \rightarrow 3\text{CO}_2 + 4\text{NADH} + 4\text{H}^+ + \text{ATP} + \text{FADH}_2$
 (iii)
-
- a)
- | I | II | III |
|------------|--------------|--------------|
| Glycolysis | Fermentation | Krebs' cycle |
- b)
- | I | II | III |
|--------------|--------------|------------|
| Krebs' cycle | Fermentation | Glycolysis |
- c)
- | I | II | III |
|--------------|------------|--------------|
| Krebs' cycle | Glycolysis | Fermentation |
- d)
- | I | II | III |
|------------|--------------|--------------|
| Glycolysis | Krebs' cycle | Fermentation |
143. Which of the following are isomers?
 a) 3PGA and 2PGA b) PGAL and DHAP c) Glucose and Fructose d) All of these
144. Phosphorylation of glucose during glycolysis is catalysed by
 a) phosphoglucomutase b) phosphoglucosomerase c) hexokinase d) phosphorylase
145. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** Respiration is the breaking of the C - C bonds of complex compounds through oxidation within the cells and release of large amount of energy.
- Reason:** The compounds that are oxidised during respiration are called respiratory substrates
- a) If both assertion and reason are true and reason is the correct explanation of assertion
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false.

146. In the electron transport chain during terminal oxidation, the cytochrome, which donates electrons to O_2 is
a) Cytochrome -b b) Cycto-C c) Cycto-a₃ d) Cycto-f
147. End product of glycolysis is____
a) acetyl Co-A b) pyruvic acid c) glucose 1-phosphate d) fructose 1-phosphate
148. If volume of CO_2 liberated during respiration is more than the volume of O_2 used, then the respiratory substrate will be:
a) carbohydrate b) fat c) protein d) organic acid.
149. End products of aerobic respiration are_____
a) sugar and oxygen b) water and energy c) carbon dioxide, water and energy
d) carbon dioxide and energy
150. The pathway of respiration common in all living organisms is ____X____ it occurs in the ____Y____ and the products formed are two molecules of ____Z____. Identify X, Y and Z in the above paragraph and select the correct answer.
- a)
- | X | Y | Z |
|-------------|---------------|--------------|
| EMP pathway | mitochondrion | pyruvic acid |
- b)
- | X | Y | Z |
|-------------|-----------|--------------|
| EMP pathway | cytoplasm | pyruvic acid |
- c)
- | X | Y | Z |
|--------------|-----------|------------|
| Krebs' cycle | cytoplasm | acetyl CoA |
- d)
- | X | Y | Z |
|--------------|---------------|------------|
| Krebs' cycle | mitochondrion | acetyl CoA |
151. As per chemiosmotic coupling hypothesis, in mitochondria, protons accumulate in the
a) outer membrane b) inner membrane c) intermembrane space d) matrix
152. Which of the following steps during glycolysis is associated with utilisation of ATP?
a) Glucose → Glucose - 6- phosphate
b) Fructose-6-phosphate → Fructose-1,6-biphosphate c) PEP → Pyruvic acid
d) Both (a) and (b)
153. The energy-releasing metabolic process in which substrate is oxidised without an external electron acceptor is called
a) Glycolysis b) Fermentation c) Aerobic respiration d) Photorespiration
154. Which metabolite is common in respiration mediated breakdown of fats, carbohydrates and proteins?
a) Acetyl CoA b) Glucose 6-phosphate c) Fructose 1, 6-biphosphate d) Pyruvic acid
155. Respiratory quotient may be represented as
a) O_2 taken in / CO_2 evolved b) CO_2 evolved / O_2 taken in c) O_2 taken in
d) CO_2 taken in.
156. Out of 36 ATP molecules produced per glucose molecule during respiration_____
a) 2 are produced outside glycolysis and 34 during respiratory chain
b) 2 are produced outside mitochondria and 34 inside mitochondria
c) 2 during glycolysis and 34 during Krebs' cycle d) all are formed inside mitochondria
157. Respiratory substrate yielding maximum number of ATP molecule is_____
a) ketogenic amino acids b) glucose c) amylose d) glycogen
158. Which of the following biomolecules is common to respiration mediated breakdown?
a) Acetyl CoA b) Glucose 6-phosphate c) Fructose 1,6-biphosphate d) Pyruvic acid
159. ATP generated by 1 NADH and 1 $FADH_2$ are respectively.
a) 3,2 b) 2,3 c) 3,5 d) 5,3

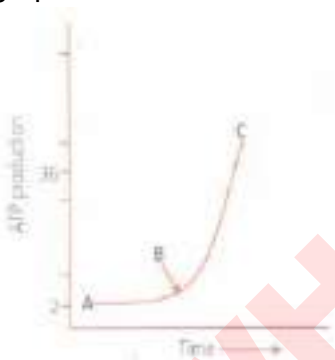
160. Mobile electrons carriers of ETS in mitochondrial membrane are

- a) PQ, PC b) CoQ, Cyt.c c) PQ, Cyt.c d) PC, CoQ

161. Study carefully the following statements and select the incorrect ones.

- (i) When fats are used in respiration, the RQ is more than unity because fats contain more O_2 and require relatively less amount of O_2 for oxidation.
 (ii) The most important energy carrier is ATP. This energy rich compound is mobile and can pass from one cell to another.
 (iii) Before pyruvic acid enters Krebs' cycle, one of the two carbon atoms of pyruvic acid is reduced to carbon dioxide in the reaction called reductive carboxylation.
 (iv) A special electron carrier system located in the mitochondrial membrane is called shuttle system. It transfers electrons from the hydrogens of cytoplasmic NADH to the mitochondrial electron carriers across the mitochondrial membrane.
 (v) Zymase is a complex mixture of many enzymes which requires several coenzymes for its action. The enzyme complex-zymase catalyses series of reactions taking place during fermentation leading to the production of ethyl alcohol
 a) (i) and (ii) b) (iii) and (iv) c) (i), (ii) and (iii) d) (iii), (iv) and (v)

162. Animal cells are suspended in a culture medium that contains excess glucose. The graph below shows glucose utilisation under different growth conditions. (A), (B), and (C) in the graph indicate.



- | | |
|---|--|
| A - Anaerobic respiration | A - Aerobic respiration |
| B - Introduction of O_2 to culture medium | B - Introduction of CO_2 to culture medium |
| a) C - Aerobic respiration | b) C - Anaerobic respiration |
| A - Aerobic respiration | A - Aerobic respiration |
| B - Supply of organic triphosphate | B - Introduction of CO to culture medium |
| c) C - Aerobic respiration | d) C - Anaerobic respiration |

163. Three of the following statements about enzymes are correct and one is wrong. Which one is wrong?

- a) Enzymes are denatured at high temperatures but in certain exceptional organisms, they are effective even at temperatures $80^{\circ}-90^{\circ}C$
 b) Enzymes are highly specific c) Most enzymes are proteins but some are lipids
 d) Enzymes require optimum pH for maximal activity

164. Select the wrong statement with respect to glycolysis.

- a) It occurs outside mitochondria. b) It is an anaerobic phase.
 c) Glucose undergoes partial oxidation to form 2 molecules of pyruvic acid.
 d) Glucose is phosphorylated to glucose-6-phosphate by isomerase enzyme.

165. Match column I with column II and select the correct option from the given codes.

Column I	Column II
----------	-----------

A. Glycolysis	(i)	Inner mitochondrial membrane
B. TCA cycle	(ii)	Mitochondrial matrix
C. ETS	(iii)	Cytoplasm

a) A-(iii), B-(i), C-(ii) b) A-(iii), B-(ii), C-(i) c) A-(i), B-(ii), C-(iii) d) A-(ii), B-(i), C-(iii)

166. Number of NADH molecules produced in EMP pathway from one glucose molecule is

a) One b) Two c) Three d) Four

167. For its activity, carboxypeptidase requires formed during an enzymatic reaction is:

a) Nitaccin b) Copper c) zinc d) Iron

168. The ultimate electron acceptor of respiration in an aerobic organism is:

a) cytochrome b) oxygen c) hydrogen d) glucose.

169. Consider the following statements with respect to respiration.

(i) Glycolysis occurs in the cytoplasm of the cell.

(ii) Aerobic respiration takes place within the mitochondria.

(iii) Electron transport system is present in the outer mitochondrial membrane.

(iv) $C_{51}H_{98}O_6$ is the chemical formula of tripalmitin, a fatty acid

(v) Respiratory Quotient = $\frac{\text{Volume of } O_2 \text{ evolved}}{\text{Volume of } CO_2 \text{ consumed}}$

Of the above statements

a) (i), (ii) and (iv) are correct b) (ii), (iii) and (iv) are correct c) (iii), (iv) and (v) are correct

d) (ii), (iv) and (v) are correct.

170. Site of Krebs' cycle in mitochondria is

a) inner membrane b) outer membrane c) matrix d) oxysomes

171. Mitochondria are called power houses of the cell. Which of the following observations support this statement?

a) Mitochondria synthesise ATP. b) Mitochondria have a double membrane

c) The enzymes of the Krebs' cycle and the cytochromes are found in mitochondria.

d) Mitochondria are found in almost all plant and animal cells.

172. The first 5C dicarboxylic acid in Krebs' cycle which is used in nitrogen metabolism is

a) OAA b) citric acid c) α -ketoglutaric acid d) acetyl coenzyme A.

173. The number of substrate level phosphorylations in one turn of citric acid cycle is_____

a) 2 b) 3 c) 0 d) 1

174. Select the correct statements.

(i) Between temperature range 0 - 25°C, rate of respiration doubles for every 10° Crise in temperature

(ii) Cytochromes are iron-porphyrin compounds.

(iii) Respiratory rate of wounded or injured plant parts generally decreases

a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

175. Which of the following cellular metabolic processes can occur both in the presence or absence of O_2 ?

a) Glycolysis b) Fermentation c) TCA cycle

d) Electron transport coupled with chemiosmosis

176. Apparatus to measure rate of respiration and RQ is_____

a) auxanometer b) potometer c) respirometer d) manometer

177. During the process of aerobic respiration, ____ (i) ____ gets oxidised and its electrons get transferred to the electron transport chain while in photosynthesis ____ (ii) ____ gets oxidised to transfer molecules to the electron transport chain.
a) (i)-glucose; (ii)-xanthophyll b) (i)-carbon dioxide, (ii) - xanthophyll
c) (i)-carbon dioxide, (ii)-chlorophyll-a d) (i)-glucose, (ii)-chlorophyll-a
178. Anaerobic respiration takes place in
a) mitochondrion b) nucleus c) cytoplasm d) vacuole
179. How many ATP molecules released when 1 molecules of glucose in our liver cells?
a) 36 b) 38 c) 2 d) 8
180. Respiratory pathway is
a) catabolic b) amphibolic c) anabolic d) endergonic
181. Seeds respire in
a) presence of O_2 b) presence of CO_2 c) absence of O_2 d) both (a) and (c)
182. First step of CO_2 liberation during aerobic respiration is
a) PEP \rightarrow Pyruvate b) Pyruvate \rightarrow Acetyl CoA c) Isocitrate \rightarrow Oxalosuccinate
d) Succinyl CoA \rightarrow Succinate
183. Which out of the following statements is incorrect?
a)
The breakdown product of glucose which enters into mitochondrion during aerobic respiration is pyruvic acid generated in the cytosol.
b)
When the electrons pass from one carrier to another via complex I to IV in the electron transport chain, they are coupled to ATP synthase (complex V) for the production of ATP from ADP and P_i .
c)
The ratio of volume of O_2 consumed in respiration to the volume of CO_2 evolved is called as the respiratory quotient (RQ).
d)
Compensation point is the point reached in a plant when the rate of photosynthesis is equal to the rate of respiration
184. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: In electron transport system, the electrons are passed on to oxygen resulting in the formation of H_2O .
Reason: Oxygen is the ultimate acceptor of electrons.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
185. Life without air would be ____
a) reductional b) free from oxidative damage c) impossible d) anaerobic
186. During anaerobic digestion of organic waste, such as in producing biogas, which one of the following is left undegraded?
a) Cellulose b) Lipids c) Lignin d) Hemi-cellulose
187. Which of the following exhibits the highest rate of respiration?

- a) Growing shoot apex b) Germinating seed c) Root tip d) Leaf bud
188. Oxidative phosphorylation involves simultaneous oxidation and phosphorylation to finally form _____ .
a) pyruvate b) NADP c) DPN d) ATP
189. At a temperature above 35°C _____
a) rate of photosynthesis will decline earlier than that of respiration
b) rate of respiration will decline earlier than that of photosynthesis
c) there is no fixed pattern d) both decline simultaneously
190. The end product of glycolysis is
a) pyruvic acid b) glucose c) ethyl alcohol d) CO₂
191. All enzymes of TCA cycle are located in the mitochondrial matrix except one which is located in inner mitochondrial membranes in eukaryotes and in cytosol in prokaryotes. This enzyme is
a) isocitrate dehydrogenase b) ketoglutarate dehydrogenase
c) succinate dehydrogenase d) lactate dehydrogenase
192. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: ATP acts as the energy currency of the cell.
Reason: ATP can be broken down to release energy wherever and whenever energy needs to be utilised.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.
193. Oxidative phosphorylation is production of _____
a) ATP in photosynthesis b) NADPH in photosynthesis c) ATP in respiration
d) NADH in respiration
194. Terminal cytochrome of respiratory chain which donates electrons to oxygen is _____
a) cyt - b b) cyt -c c) cyt - a₁ d) cyt - a₃
195. FAD participates in Krebs' cycle as electron acceptor during conversion of
a) succinyl CoA to succinic acid b) α -ketoglutarate to succinyl CoA
c) succinic acid to fumaric acid d) fumaric acid to malic acid.
196. The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of _____
a) 1 molecule of 6-C compound
b) 1 molecule of 4-C compound and 1 molecule of 2-C compound
c) 2 molecules of 3-C compound d) 1 molecule of 3-C compound
197. During oxidation of one mole of glucose, 36 ATP can be obtained by which of the following distribution?
a) Glycolysis-2, Citric acid cycle-6, ETS-28 b) Glycolysis-2, Citric acid cycle-2, ETS-32
c) Glycolysis-4, Citric acid cycle-2, ETS-30 d) Glycolysis-2, Citric acid cycle-4, ETS-30
198. Transition state structure of the substrate formed during an enzymatic reaction is:
a) Permanent and stable b) transient but stable c) Permanent but unstable
d) transient and unstable
199. Substrate level phosphorylation occurs during which step of Krebs' cycle?

- a) Succinyl CoA → Succinic acid b) Isocitric acid → Oxalosuccinic acid
c) Oxalosuccinic acid → α-ketoglutaric acid d) Malic acid → OAA
200. Which of the molecule listed below is a product of fermentation of glucose by yeast?
a) (C₆H₁₀O₅)_n b) C₂H₅OH c) C₆H₁₂O₆ d) CH₃OH
201. Select the correct sequence of formation of given intermediates of Krebs' cycle.
a) Succinate → Malate → Fumarate → OAA
b) Fumarate → Succinate → Malate → OAA
c) Succinate → Fumarate → Malate → OAA
d) Malate → Fumarate → Succinate → OAA
202. The intermediate product between α-ketoglutaric acid and succinic acid in TCA cycle is
a) acetyl CoA b) succinyl CoA c) fumarate d) oxalosuccinic acid
203. Consider the first reaction of TCA cycle.
- $$\text{Acetyl CoA} + \text{OAA} + \text{H}_2\text{O} \xrightarrow[\text{Synthesis}]{\text{Citrate}} \text{A} + \text{CoA}$$
- What is true about compound A?
a) First product of TCA cycle b) Tricarboxylic acid and six carbon compound
c) It undergoes reorganisation in the presence of enzyme aconitase to form cis-aconitate
d) All of these
204. Most of the energy of the carbohydrates is released by oxidation when
a) Pyruvic acid is converted into CO₂ and H₂O
b) Pyruvic acid is converted into CO₂ and H₂O c) Sugar is converted into pyruvic acid
d) glucose is converted into alcohol and CO₂
205. In animal cells, the first stage of glucose breakdown is ____
a) Krebs' cycle b) glycolysis c) oxidative phosphorylation d) ETC
206. Respiratory substrates are the organic substances which are _____ during respiration to liberate energy.
a) oxidised b) reduced c) synthesised d) both (a) and (b)
207. Electron transport chain (ETC) is a set of ____ electron carriers present in a specific sequence along ____ mitochondrial membrane.
a) seven, inner b) six, inner c) seven, outer d) six, outer
208. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: The first step in TCA cycle is the condensation of pyruvate with oxaloacetic acid and water.
Reason: This reaction is catalysed by enzyme pyruvate synthase
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
209. RQ is ____
a) C/N b) N/C c) CO₂/O₂ d) O₂/CO₂
210. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. RQ	(i) Chemiosmotic ATP synthesis
B. Mitchel	(ii) Muscle fatigue

Column I	Column II
C. Cytochromes	(iii) Inner mitochondrial membrane
D. Lactic acid	(iv) Alcoholic fermentation
E. Yeast	(v) Respirometer

- a) A-(v), B-(i), C-(iii), D-(ii), E-(iv) b) A-(v), B-(i), C-(iii), D-(iv), E-(ii)
 c) A-(i), B-(v), C-(ii), D-(iii), E-(iv) d) A-(v), B-(ii), C-(iv), D-(iii), E-(i)

211. RQ of proteins, carbohydrates, fats and organic acids are in order

- a) $<1, 1, <1, >1$ b) $>1, <1, 1, 1$ c) $1, 1, 0, -1$ d) $0, <1, 1, >1$.

212. Identify the enzymes 1 and 2 in the given reaction and select the correct option.



a)

1	2
Alcohol dehydrogenase	Pyruvate decarboxylase

b)

1	2
Alcohol dehydrogenase	Pyruvate decarboxylase

c)

1	2
Pyruvate decarboxylase	Alcohol dehydrogenase

d)

1	2
Pyruvate decarboxylase	Alcohol dehydrogenase

213. Fate of pyruvic acid during aerobic respiration is:

214. Which of the following statements regarding mitochondrial membrane is NOT correct?

- a) The inner membrane is highly convoluted forming a series of infoldings
 b) The outer membrane resembles a sleeve
 c) The outer membrane is permeable to all kinds
 d) The enzymes of the electron transfer chain are embedded in the outer membrane

215. The end product of oxidative phosphorylation is:

- a) NADH b) Oxygen c) ADP d) $\text{ATP} + \text{H}_2\text{O}$.

216. Site of EMP pathway in eukaryotes is

- a) Inner mitochondrial membrane b) Cytoplasm c) Mitochondrial matrix
 d) Both (2) & (3)

217. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Respiratory pathway is an amphibolic pathway.

Reason: In respiration, there is breakdown of many substances (catabolism) and synthesis of many substances (anabolism) by respiratory intermediates

- a) If both assertion and reason are true and reason is the correct explanation of assertion
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false. d) If both assertion and reason are false

218. Refer to the given figure and select the correct option for A, B, C and D.



a)

A	B	C	D
Fats	Proteins	3-PGAL	Acetyl CoA

b)

A	B	C	D
Fats	Proteins	3-PGAL	CO_2

c)

A	B	C	D
Proteins	Fats	Acetyl CoA	PEP

d)

A	B	C	D
Proteins	Fats	PEP	Acetyl CoA

219. Out of 38 ATP molecules produced per glucose, 32 ATP molecules are formed from $\text{NADH}/\text{FADH}_2$ in _____.

a) respiratory chain b) Krebs' cycle c) oxidative decarboxylation d) EMP

220. The flow chart given below shows the steps in glycolysis. Select the option that correctly fills in the missing steps A, B, C and D



a)

A	B	C	D
Fructose-6-phosphate	Fructose-1,6-biphosphate	3-PGAL	1,3-biphospho glyceric acid

b)

A	B	C	D
Fructose-1,6-biphosphate	3-PGAL	1, 3-biphospho glyceric acid	3 PGA

c)

A	B	C	D
3-PGA	1,3- biphospho	3-PGAL	Fructose- 1,6- biphosphate

d)

A	B	C	D
Fructose-1,6-biphosphate	Fructose -6-phosphate	3-PGAL	1,3-biphosphoglyceric acid

221. Maximum amount of energy/ATP is liberated on oxidation of _____

- a) fats b) Proteins c) starch d) vitamins

222. Ethyl alcohol fermentation occurs in

- a) Lactobacillus b) muscles of humans c) Rhizopus d) all of these

223. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: When carbohydrates are used as substrate and are completely oxidised, the RQ is equal to 1.

Reason: When proteins are used in respiration, the RQ is greater than 1.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

PLANT GROWTH AND DEVELOPMENT 1

Marks : 994

1. Pollen grains can be stored for several years in liquid nitrogen having temperature of ____
a) -196°C b) -80°C c) -120°C d) -160°C
2. Vernalisation can often be replaced by
a) auxin b) cytokinins c) gibberellins d) ethylene.
3. Select the mismatched pair.
a) Gibberellic acid - Increases yield of sugarcane
b) Cytokinin - Promotes apical dominance c) Ethylene - Sprouting of potato tuber
d) Abscissic acid - Inhibits seed germination
4. Which one of the following growth regulators is known as 'stress hormone'?
a) Abscissic acid b) Ethylene c) GA_3 d) Indole acetic acid
5. Apical dominance in dicot plants is due to the presence of more _____ in the apical bud than in the lateral ones.
a) auxins b) cytokinins c) gibberellins d) ethylene
6. From evolutionary point of view, retention of the female gametophyte with developing young embryo on the parent sporophyte for some time, is first observed in ____
a) Mosses b) pteridophytes c) Gymnosperms d) Liverworts
7. Cytokinins help to produce all except
a) new leaves b) chloroplast in leaves
c) lateral shoot growth and adventitious shoot formation d) rooting on cut stem
8. Plants which require an exposure to light for a period greater than critical day length are
a) long day plants b) short day plants c) long-short day plants d) short-long day plants
9. The biological activity of I.A.A is tested by:-
a) α - amylase b) Avena curvature test c) Soyabean callus test
d) Chlorophyll preservation test
10. In short-day plants, flowering is induced by ____
a) long night b) short photoperiod and interrupted long night
c) photoperiod less than 12 hrs
d) photoperiod below a critical length and uninterrupted long night

11. The hormone responsible for apical dominance is



- a) IAA b) GA c) ABA d) Floigen
12. Vascular cambium and cork cambium are
a) lateral meristems b) intercalary meristems c) primary meristems d) apical meristems
13. Hormone primarily concern with cell division is
a) IAA b) NAA c) cytokinin d) gibberellic acid
14. What reason will you assign for coconut milk used in tissue culture?
a) Gibberellins b) Cytokinins c) Auxins d) Ethylene
15. Which of the following physiological effects is caused in plants by gibberellic acid?
a) Shortening of genetically tall plants b) Elongation of genetically dwarf plants
c) Rooting in stem cuttings d) Yellowing of young leaves
16. Which plant hormone induces the phenomenon of phototropism in plants?
a) Auxins b) Ethylene c) Cytokinin d) Gibberellin
17. The closing and opening of the leaves of *Mimosa pudica* is due to _____.
a) thermonastic movement b) hydrotropic movement c) seismonastic movement
d) chemonastic movement
18. Removal of apical bud results in _____.
a) formation of new apical bud b) elongation of main stem c) death of plant
d) formation of lateral branching
19. A process of breaking seed dormancy of some plants in which seeds are treated in moist medium at low temperature (5-10°C) for sufficient period of time is known as.
a) scarification b) stratification c) vernalisation d) none of these.
20. Four potted plants (I, II, III, and IV) of a short day plant, which has the critical period of 14 hours; are taken and exposed to light for different time periods. The light periods given are listed in the table.

Potted plant	Photoperiod
I	10 hrs
II	15 hrs
III	16 hrs
IV	20 hrs

Which potted plant will show flowering after exposure to light?

- a) I b) II c) III d) IV
21. Gibberellins induce_____

- a) flowering b) production of hydrolysing enzymes in germinating seeds c) cell division
d) hasten leaf senescence

22. Cabbage is a biennial plant which produces flowers in second year of growth. In an attempt to make it flower in a single year, four potted plants (I, II, III, and IV) of cabbage were subjected to different temperatures for several days as given in the table.

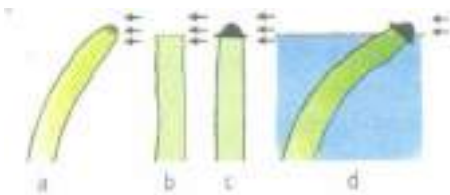
Potted plant	Temperature
I	5 ⁰ C
II	20 ⁰ C
III	30 ⁰ C
IV	25 ⁰ C

Which potted plant will show flowering?

- a) I b) II c) III d) IV
23. Hormone antagonist to gibberellins is
a) IAA b) ABA c) Zeatin d) Ethylene
24. Which of the following statements regarding gibberellins is incorrect?
a) GA₃ was one of the first gibberellins to be discovered. b) All GA are acidic
c) They increase the length of plant axis as in grapes, sugarcane etc.
d) They promote senescence
25. Ethylene is used for
a) retarding ripening of tomatoes b) hastening of ripening of fruits
c) slowing down ripening of apples d) both (b) and (c).
26. Artificial application of auxins like IAA, IBA and NAA to unpollinated pistils can form
a) fruits with much flesh b) larger fruits c) sweet fruits d) seedless fruits.
27. A cell at telophase stage is observed by a student in a plant brought from the field. He tells his teacher that this cell is not like other cells in telophase stage. There is no formation of cell plate and thus the cell is containing more number of chromosomes as compared to other dividing cells. This would result in :-
a) Aneuploidy b) Polyploidy c) Somaclonal variation d) Polyteny
28. Growth in plants is
a) both determinate and indeterminate b) only determinate c) only indeterminate
d) mostly determinate
29. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: The most widely used compound as source of ethylene is ethephon.
Reason: Ethephon hastens fruit ripening in tomatoes and apples and accelerates abscission in stems and leaves.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.
30. Phytochrome is involved in_____
a) phototropism b) photorespiration c) photoperiodism d) geotropism

31. In aquatic plant *Ranunculus flabellaris* (buttercup), submerged leaves are highly dissected whereas the emerged leaves are broad and lobed. This is an example of
a) heterophylly b) environmental plasticity c) phenology d) both (a) and (b).
32. Match the following.
- | | | |
|---------------|-------|--------------------|
| A. IAA | (i) | Herring sperm DNA |
| B. ABA | (ii) | Bolting |
| C. Ethylene | (iii) | Stomatal closure |
| D. GA | (iv) | Weed-free lawns |
| E. Cytokinins | (v) | Ripening of fruits |
- a) A-(iv), B-(iii), C-(v), D-(ii), E-(i) b) A-(v), B-(iii), C-(iv), D-(ii), E-(i)
c) A-(iv), B-(i), C-(iv), D-(iii), E-(ii) d) A-(v), B-(iii), C-(ii), D-(i), E-(iv)
33. **Assertion:** Kinetin is found naturally in plants.
Reason : Cytokinin breaks seed and bud dormancy.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
34. Seed dormancy is caused by
a) C_2H_4 b) ABA c) IAA d) GA_3
35. Movement of leaves of sensitive plant, *Mimosa pudica* is due to _____.
a) thermonasty b) Seismonasty c) hydrotropism d) chemonasty
36. To get a carpet like grass, lawns are mowed regularly, this is done to
a) remove the shoot apical meristem b) remove the axillary buds
c) accelerate the growth of terminal bud d) both (b) and (c).
37. Apples are generally wrapped in waxed paper to
a) prevent sunlight for changing its colour
b) prevent aerobic respiration by checking the entry of O_2
c) prevent ethylene formation due to injury d) make the apples look attractive.
38. Which of the following is not an inhibitory substance governing seed dormancy ?
a) Phenolic acid b) Para - ascorbic acid c) Gibberellic acid d) Absciscic acid
39. Which is employed for artificial ripening of banana fruits?
a) Auxin b) Crmarin c) Ethylene d) Cytokinin
40. Intrinsic heterophylly is found in all except
a) cotton b) buttercup c) coriander d) larkspur
41. Examples of tissues that are formed by redifferentiation are
a) secondary xylem b) secondary phloem c) cork cell d) all of these
42. Which one of the following statements is correct?
a) Horsetails are gymnosperms.
b) *Selaginella* is heterosporous, while *Salvinia* is homosporous.
c) Owles are not enclosed by ovary wall in gymnosperms.
d) Steins are usually unbranched in both *Cycas* and *Cedrus*.

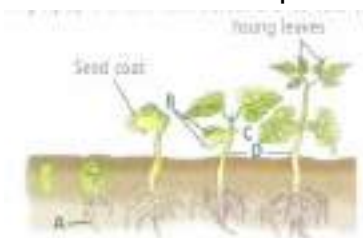
43. The fruits can be left on the tree longer using GA so as to extend the market period. This is due to which function of GA?
a) Bolting b) Delaying senescence c) Internodal elongation d) Inducing parthenocarpy
44. Dormancy of seeds is broken by red light in
a) gram b) pea c) lettuce d) castor
45. Which of the following inhibitors causes seed dormancy?
a) Abscissic acid b) Phenolic acid c) Para ascorbic acid d) All of these
46. A young dicot seedling (e.g., soyabean) is laid horizontally on a surface and is subjected to gravity stimulus. The shoot bends in upward direction and the root bends in downward direction. Which out of the following is the possible reason for this movement?
a)
Redistribution of auxins throughout the seedlings is responsible for the stimulatory unequal growth in shoots and roots.
b)
Redistribution of cytokinins throughout the seedlings is responsible for the stimulatory unequal growth in roots and shoots.
c)
Redistribution of auxins in roots and cytokinins in shoots is responsible for stimulatory unequal growth.
d)
Redistribution of auxins in shoots and cytokinins in roots is responsible for stimulatory unequal growth.
47. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: In some plants flowering depends only on a combination of light and dark exposure.
Reason: The site of perception of light or dark duration are the shoot apices of plants.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
48. Avena curvature test is a bioassay for examining the activity of



- a) auxins b) gibberellins c) cytokinins d) ethylene
49. In which of the following forms is iron absorbed by plants?
a) Free element b) Ferrous c) Ferric d) Both ferric and ferrous
50. Primary precursor of I.A.A is :

a) Phenyl alanine b) Tyrosine c) Tryptophan d) Leucin

51. Read the given statements and select the option that correctly identifies the incorrect ones.
- (i) Cytokinin is primarily concerned with cell division.
 - (ii) C_2H_4 breaks seed and bud dormancy
 - (iii) ABA stimulates the opening of stomata.
 - (iv) C_2H_4 initiates germination in peanut seeds, sprouting of potato tubers.
 - (v) ABA is synergistic to GA.
- a) (i), (ii) and (iv) b) (iii) and (ii) c) (iii) and (v) d) (iv) and (v)
52. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** Absciscic acid (ABA) is also called stress hormone.
- Reason:** ABA increases the tolerance of plants to various kinds of stresses
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false d) If both assertion and reason are false.
53. Gibberellin was first extracted from
- a) Gibberella fujikori b) Gelidium c) Gracilaria d) Aspergillus
54. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** Auxins help to prevent fruits and leaves drop at early stages.
- Reason:** Auxins promote the abscission of older mature leaves and fruits.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
55. Phototropic and geotropic movements are linked to_____
- a) gibberellins b) enzymes c) auxins d) cytokinins
56. The hormone responsible for apical dominance is_____
- a) IAA b) GA c) ABA d) florigen
57. During cell growth, DNA synthesis takes place in:-
- a) G_2 phase b) M phase c) S phase d) G_1 phase
58. A farmer grows cucumber plants in his field. He wants to increase the number of female flowers in them. Which plant growth regulator can be applied to achieve this?
- a) ABA b) Ethylene c) GA d) Cytokinins
59. The given diagram shows different stages of seed germination. Identify A, B, C and D and select the correct option.



a)

A	B	C	D
Plumule	Cotyledons	Epicotyl	Hypocotyl

b)

A	B	C	D
Radicle	Cotyledons	Epicotyl	Hypocotyl

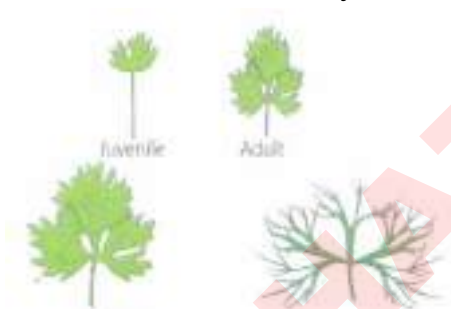
c)

A	B	C	D
Mesocotyl	Cotyledons	Epicotyl	Hypocotyl

d)

A	B	C	D
Root hair	Cotyledons	Hypocotyl	Epicotyl

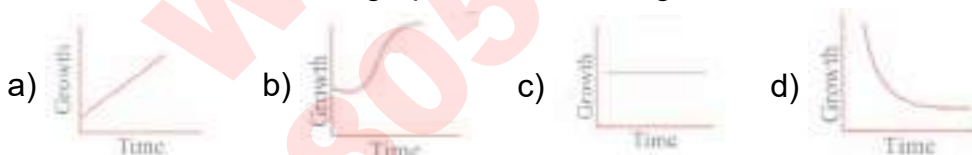
60. You are given a tissue with its potential for difference in an artificial culture. Which of the following pairs of hormones would you add to the medium to secure shoots as well as roots?
 a) Auxin and abscisic acid b) Gibberellin and abscisic c) IAA and gibberellin
 d) Auxin and cytokinin
61. Cells of tracheary elements (tracheids and vessels) become dead at maturity and lose their protoplasm due to the deposition of lignocellulosic cell wall thickenings. This is an example of
 a) growth b) differentiation c) dedifferentiation d) dedifferentiation
62. Which of the following prevents fall of fruits?
 a) GA_3 b) NAA c) Ethylene d) Zeatin
63. Different kinds of structures develop in plants in different phases of growth or in response to environment. This ability is called _____.



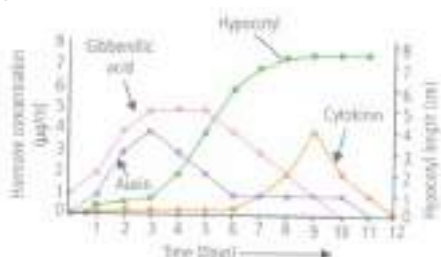
- a) plasticity b) elasticity c) heterophylly d) differentiation
64. If a tree, flowers thrice in a year (Oct., Jan. and July) in Northern India, it is said to be ____
 a) photosensitive but thermoinsensitive b) thermosensitive but photoinsensitive
 c) photosensitive and thermosensitive d) photoinsensitive and thermoinsensitive
65. Phototropic curvature is the result of uneven distribution of ____
 a) gibberellin b) phytochrome c) cytokinins d) auxin
66. Anthesis is a phenomenon which refers to ____
 a) reception of pollen by stigma b) formation of pollen c) development of anther
 d) opening of flower bud
67. Fruit and leaf drop at early stages can be prevented by the application of ____
 a) Ethylene b) Auxins c) Gibberellic acid d) Cytokinins
68. Growth can be measured in various ways. Which of these can be used as parameters to measure growth?
 a) Increase in cell number b) Increase in cell size c) Increase in length and weight
 d) All the above
69. Increase in girth (diameter) of plant as a result of the activities of lateral meristems is called
 a) primary growth b) secondary growth c) open form of growth d) diffuse growth

70. Phenomenon of photoperiodism was first discovered by _____ in the "Maryland mammoth" variety of _____.
 a) Garner and Allard, tobacco b) Went, tobacco c) Garner and Allard, cocklebur
 d) Knott, cocklebur
71. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Auxin was isolated by F.W.Went from the tips of coleoptiles of wheat seedlings.
Reason: Ethylene delays the senescence.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false
72. The effect of daily duration of light and dark periods on the growth and development of plants, especially flowering, is called
 a) thermotaxis b) thermotropism c) phototropism d) photoperiodism
73. Induction of flowering in plants by low temperature treatment is called:
 a) Vernalization b) Photoperiodism c) Cryobiology d) Chilozyology
74. Increased vacuolation, cell enlargement and new cell wall deposition are the characteristics of cells in _____ phase of growth.
 a) meristematic b) elongation c) maturation d) differentiation
75. Ethylene gas is used for _____
 a) growth of plants b) delaying fruits abscission c) ripening of fruits
 d) stopping the leaf abscission

76. Which one is the correct graph for arithmetic growth?



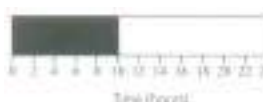



77. The gaseous hormone concerned with fruit ripening is
 a) CK b) Ethylene c) Abscissic acid d) NAA
78. Plant hormones play a role in regulating seed germination. The graph shows changes in hormone concentrations (left axis) and hypocotyl growth (right axis) over time for moong bean. Which hormone(s) most likely regulates hypocotyl (bean sprout) growth during moong bean germination?



- a) Gibberellic acid b) Auxin c) Cytokinin alone d) Both (a) and (b)
79. "Foolish seedling" disease of rice led to the discovery of _____

- a) ABA b) 2,4 - D c) IAA d) GA
80. What causes a green plant to bend towards light as it grows?
a) Because green plant need light to carry on photosynthesis
b) Because green plant are phototropic
c) Light stimulates plant cells on the lighted side to grow faster
d) Auxin accumulates on the shaded side
81. Monocarpic plants are those which
a) bear flowers with one ovary b) flower once and die c) bear only one flower
d) all of the above.
82. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: Primary growth of the plants contributes to the elongation of the plants along their axis.
Reason: Root apical meristem and shoot apical meristem are responsible for primary growth of the plants.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
83. Cut or excised leaves remain green for long if induced to root or dipped in____
a) gibberellins b) cytokinins c) auxins d) ethylene
84. Match column I with column II and select the correct option from the codes given below.
- | Column I | Column II |
|-----------------|---------------------------------------|
| A. Auxins | (i) Breaking seed dormancy |
| B. Gibberellins | (ii) Inducing fruit ripening |
| C. Cytokinins | (iii) Formation of abscission layer |
| D. Ethylene | (iv) Root initiation |
| | (v) Chloroplast development in leaves |
- a) A-(iv), B-(i), C-(v), D-(ii) b) A-(iv), B-(v), C- (iii), D-(ii) c) A-(i), B-(iii), C-(ii), D-(iv)
d) A-(iii), B-(iv), C-(i), D-(v)
85. Secondary growth generally occurs in
a) monocots b) dicots c) gymnosperms d) both (b) and (c).
86. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: 2, 4-D is extensively used in agricultural and horticultural practices.
Reason: 2, 4-D is a herbicide.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.
87. Hormone that promotes growth of lateral buds and has negative effect on apical dominance is

- a) cytokinin b) gibberellin c) auxin d) both (b) and (c).
88. _____ are the examples of tissues, formed by dedifferentiation.
a) Interfascicular cambium b) Cork cambium c) Both (a) and (b) d) Tracheary elements
89. An enzyme that can stimulate germination of barley seeds is _____.
a) lipase b) protease c) invertase d) α -amylase
90. Leaf fall can be prevented with the help of _____.
a) abscisic acid b) auxins c) florigen d) cytokinins
91. Gibberellins promote the formation of A flowers on genetically B plants in Cannabis whereas ethylene promotes formation of C flowers on genetically D Cannabis plants.
- a)
- | A | B | C | D |
|------|--------|--------|------|
| male | female | female | male |
- b)
- | A | B | C | D |
|------|------|--------|--------|
| male | male | female | female |
- c)
- | A | B | C | D |
|--------|------|------|--------|
| female | male | male | female |
- d)
- | A | B | C | D |
|--------|--------|------|------|
| female | female | male | male |
92. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Vernalisation is the promotion of flowering by a period of low temperature.
Reason: It prevents precocious reproductive development late in the growing season.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.
93. Phototropism is due to the hormone
a) IAA b) GA c) 2-4 D d) Cytokinin
94. Differentiation of shoot is controlled by _____.
a) high gibberellin : cytokinin ratio b) high auxin : cytokinin ratio
c) high cytokinin : auxin ratio d) high gibberellin : auxin ratio
95. A chemical believed to be involved in flowering is _____.
a) gibberellin b) kinetin c) florigen d) IBA
96. Sedum is a long day plant. Its critical duration of light is 13 hours. Under which of the following conditions would it flower?
[Key: = Period of light. = Period of darkness]
- a) 
- b) 
- c) 
- d) 
97. The process of growth is maximum during _____.
a) Senescence b) Dormancy c) Log phase d) Lag phase
98. High concentration of auxin is present in
a) root apex b) stem apex c) node d) petiole

99. Select the correctly written scientific name of Mango which was first described by Carolus Linnaeus _____.
a) *Mangifera indica* Linn. b) *Mangifera indica* c) *Mangifera Indica*
d) *Mangifera indica* Car Linn
100. Which of the following is weed killer?
a) ABA b) 2, 4-D c) NAA d) GA
101. In the process of apical dominance, lateral buds are unable to grow in the presence of apical bud. This is due to:
a) less amount of auxin in apical bud b) more amount of auxin in apical bud
c) less amount of cytokinins in lateral buds d) more amount of cytokinins in lateral buds.
102. Bolting, ie., internode elongation just prior to flowering in beet, cabbage and many rosette plants, is promoted by
a) auxins b) gibberellins c) cytokinins d) ethylene
103. Internodal elongation is stimulated by
a) auxin b) ABA c) cytokinin d) gibberellin
104. Certain chemical substance having profound effect on plant growth are called :
a) Catalytic agents b) Phytohormones c) Enzymes d) Compost
105. Root development is promoted by:
a) Auxin b) Gibberellin c) Ethylene d) Absciscic acid
106. The natural plant hormones were first isolated from
a) Cotton fruits, spinach leaves and rice plant
b) *Avena coleoptiles*, spinach leaves and fungus *Gibberella*
c) Human urine and corn germ oil d) Human urine and rice plant
107. Dr. F. Went noted that if coleoptile tips were removed and placed on agar for one hour, the agar would produce a bending when placed on one side of freshly-cut coleoptile stumps. Of what significance is this experiment?
a) It made possible the isolation and exact identification of auxin.
b)
It is the basis for quantitative determination of small amounts of growth-promoting substances.
c) It supports the hypothesis that IAA is auxin.
d) It demonstrated polar movement of auxins
108. Plants deficient of element zinc, show its effect on the biosynthesis of plant growth hormone_____
a) absciscic acid b) auxin c) cytokinin d) ethylene
109. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Gibberellins cause fruits like apple to elongate and improve its shape.
Reason: GA₃ is used to speed up the malting process in brewing industry.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false
110. In addition to auxins, _____ must be supplied to culture medium to obtain a good callus in plant tissue culture.
a) ABA b) cytokinins c) gibberellins d) ethylene
111. Hormone responsible for senescence _____
a) ABA b) auxin c) GA d) cytokinin
112. Sweet potato is a modified _____
a) tap root b) adventitious root c) stem d) rhizome
113. Which one of the following pairs, is not correctly matched?
a) Gibberellic acid- Leaf fall b) Cytokinin - Cell wall elongation
c) IAA - Cell wall elongation d) Abscissic acid - Stomatal closure
114. A few normal seedlings of tomato were kept in a dark room. After a few days they were found to have become white-coloured like albinos. Which of the following terms will you use to describe them?
a) Mutated b) Embolised c) Etiolated d) Defoliated
115. The term 'auxin precursor' refers to
a) raw material used in the synthesis of auxin
b) compound which inhibits the action of auxin c) artificially synthesised auxin
d) active form of auxin.
116. Natural cytokinins are synthesised in regions where rapid cell division occurs. Such regions are:
a) root apices b) developing shoot buds c) young fruits d) all of these
117. Development in plants is influenced by both intrinsic and extrinsic factors. Which of the following is included under intrinsic factors?
a) Growth regulators b) Oxygen c) Water d) All of these
118. Hormone produced during leaf fall is:
a) IAA b) ABA c) Florigen d) Kinetin
119. Artificial ripening of fruits is caused by the treatment of
a) IAA b) NAA c) ethylene d) kinetin
120. Given graph is drawn on the parameters of growth versus time. Here A, B and C respectively represent



- a) exponential phase, log phase and steady state phase
b) steady state phase, lag phase and log phase

- c) log phase, steady state phase and logarithmic phase
d) log phase, lag phase and steady state phase.
121. Read the given statements and select the correct option.
(i) Darwin and Darwin (1880) found that sensation of unilateral illumination was perceived by the coleoptile tip of canary grass.
(ii) IAA is universal natural auxin, discovered by Kogi et al.
(iii) IBA is both natural and synthetic auxin.
(iv) Auxins promote the growth of lateral shoots.
a) Statements (i) and (ii) are correct. b) Statements (ii) and (iii) are correct.
c) Statements (i), (ii) and (iii) are correct. d) Statements (i), (ii), (iii) and (iv) are correct.
122. Absciscic acid causes _____
a) stomatal closure b) stem elongation c) leaf expansion d) root elongation
123. Which of the following induces femaleness in plants?
a) Auxin & ethylene b) Ethanol c) ABA d) Gibberellin
124. A plant hormone used for inducing morphogenesis in plant tissue culture is _____.
a) gibberellins b) cytokinins c) ethylene d) abscisic acid
125. The phenomenon of apical dominance can be overcome by exogenous application of
a) auxins b) gibberellins c) cytokinins d) ethylene
126. _____ includes all the changes that an organism undergoes during its life cycle, from seed germination to senescence.
a) Growth b) Differentiation c) Dedifferentiation d) Development
127. One of the synthetic auxin is _____.
a) IAA b) GA c) IBA d) NAA
128. Living differentiated cells which have otherwise lost the capacity to divide, can regain the power of division under certain conditions. This phenomenon is termed as
a) differentiation b) dedifferentiation c) redifferentiation d) development
129. Coconut water contains
a) ABA b) auxin c) cytokinin d) gibberellin
130. The effect of apical dominance can be overcome by which of the following hormone?
a) IAA b) Ethylene c) Gibberellin d) Cytokinin
131. Select the correct statement(s) regarding auxins.
a)
Auxins promote root growth only at extremely low concentrations and they inhibit root growth at higher concentrations.
b)
Concentration of auxins which is inhibitory to root growth causes initiation of adventitious roots from the nodes or basal regions of stem.
c) Auxins such as NAA and IBA are used to induce rooting in stem cuttings. d) All of these
132. Read the given statements and identify the plant hormones X, Y and Z.
(i) Hormone Y induces flowering in mango and also promotes rapid internode/petiole elongation in deep water rice plants and hence helping leaves or upper part of shoot to remain

above water.

(ii) Hormone X promotes root growth and root hair formation.

(iii) Hormone Z inhibits the seed germination, increases the tolerance of plant to various stresses, play important role in seed development, maturation and dormancy.

a) Y - ABA, X - Auxin, Z - GA b) Y - C_2H_4 , X - Auxin, Z - GA c) Y - Auxin, X - C_2H_4 , Z - GA

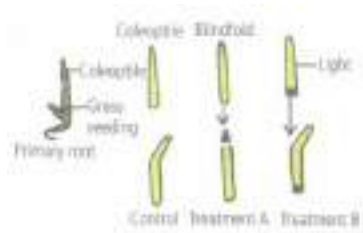
d) Y - C_2H_4 , X - C_2H_4 , Z - ABA

133. Abscissic acid controls____

a) cell division b) leaf fall and dormancy c) shoot elongation

d) cell elongation and wall formation

134. Charles Darwin and his son, Francis experimented with phototropism of grass seedlings by placing a metal foil blindfold over different parts of the seedling's coleoptile. A simplified version of their results is shown below. Which of the following statements best explains their results?



a)

The light signal is perceived a few millimetres below the tip, and these cells cause the coleoptile to grow toward the light.

b) Both the seedling root and coleoptile perceive and respond to light in the same manner

c) A chemical messenger must travel from the base of the coleoptile to the tip.

d)

The light signal is perceived at the tip of the coleoptile, but the growth response occurs a few millimetres below the tip.

135. Meristematic cells are characterised by

a) thin cellulosic cell walls b) dense protoplasm c) prominent nuclei d) all of these

136. The response of different organisms to environmental rhythms of light and darkness is called_____

a) phototaxis b) photoperiodism c) phototropism d) vernalisation

137. Auxanometer is meant for measuring -

a) Respiratory activity b) Photosynthetic activity c) Growth activity d) Osmotic pressure

138. Typical growth curve in plants is_____

a) Linear b) Stair-steps shaped c) Parabolic d) Sigmoid

139. Photoperiodism was first characterized in:

a) Cotton b) Tobacco c) Potato d) Tomato

140. Which of the following effects of auxins on plants is the basis for their commercial application?

a) Callus formation b) Curvature of stem c) Induction of root formation in stem cuttings

d) Induction of shoot formation

141. Which of the following hormones is used in root formation on stem cutting?

a) Kinetin b) GA c) ABA d) IBA

142. Functions of auxins include
 a) promoting flowering in pineapple b) inducing parthenocarpy in tomato
 c) use as herbicides to kill dicot weeds d) all of these
143. Read the given statements to identify the phytohormone that performs these functions.
 (i) Horizontal growth of seedlings, swelling of the axis and apical hook formation in dicot seedlings.
 (ii) Promoting senescence and abscission of leaves and flowers.
 (iii) Breaking seed and bud dormancy.
 (iv) Initiating germination in peanut seeds.
 (v) Sprouting of potato tubers.
 a) ABA b) Ethylene c) GA d) Cytokinins
144. Which of the following hormones can replace vernalisation?
 a) Auxin b) Cytokinin c) Gibberellins d) Ethylene
145. Low temperature treatment to speed up the process of flowering is referred to as
 a) photoperiodism b) vernalisation c) thermoperiodism d) hydroponics
146. Name the plant growth regulators which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop____
 a) Ethylene b) Absciscic acid c) Cytokinin d) Gibberellin
147. The dedifferentiated cells mature to form some specific cells to perform specific functions, this is referred to as
 a) differentiation b) dedifferentiation c) redifferentiation d) development
148. Hormone involved in phototropism is
 a) IAA b) gibberellin c) kinetin d) 2, 4-D.
149. Auxin can be bioassayed by____
 a) Hydroponics b) Potometer c) Lettuce hypocotyl elongation
 d) Avena coleoptile curvature
150. Which one is paired incorrectly?
 a) Auxin - Isolated from human urine
 b) Zeatin - Isolated from corn kernels and coconut milk
 c) Gibberellins - Isolated from fungus G.fujikori
 d) Absciscic acid - Isolated from ripened oranges

151. Match column I with column II and select the correct option from the codes given below.

Column I (Phytohormone)	Column II (Plant part where it is synthesised)
A. IAA	(i) Tissues undergoing senescence
B. Cytokinins	(ii) Shoot apices
C. Ethylene	(iii) Root apices

- a) A-(ii), B-(iii), C-(i) b) A-(ii), B-(iii), C-(i) c) A-(i), B-(ii), C-(iii) d) A-(ii), B-(i), C-(iii)
152. Match column I with column II and select the correct option from the codes given below

Column I	Column II
A. Auxin	(i) Fruit ripening

	Column I		Column II
B.	Cytokinins	(ii)	Phototropism
C.	Abscisic acid	(iii)	Antagonist to GAs
D.	Ethylene	(iv)	Growth of lateral buds

- a) A-(iv), B-(ii), C-(iii), D-(i) b) A-(ii), B-(iv), C-(iii), D-(i) c) A-(ii), B-(iii), C-(iv)/ D-(i)
d) A-(iii), B-(iv), C-(ii)/ D-(i)

153. Cytokinins_____

- a) promote abscission b) influence water movement c) help retain chlorophyll
d) inhibit protoplasmic streaming

154. Growth is primarily affected by two climatic factors which are?

- a) Light and temperature b) Temperature and relative humidity c) Light and wind
d) Rainfall and temperature

155. Spindle fibres attach on to :-

- a) Telomere of the chromosome b) Kinetochore of the chromosome
c) Centromere of the chromosome d) Kinetosome of the chromosome

156. Bananas can be prevented from over-ripening by_____

- a) maintaining them at room temperature b) refrigeration
c) dipping in ascorbic acid solution d) storing in a freezer

157. Parthenocarpic tomato fruits can be produced by?

- a) raising the plants from vernalized seeds
b) treating the plants with phenylmercuric acetate
c) removing androecium of flowers before pollen grains are released
d) treating the plants with low concentrations of gibberellic acid and auxins

158. Functions of plant growth promoters and plant growth inhibitors are given here in a jumbled up manner. Select the option that correctly segregates these functions.

- (i) Cell division
(ii) Cell enlargement
(iii) Pattern formation
(iv) Tropic growth
(v) Flowering
(vi) Fruiting
(vii) Seed germination
(viii) Response to wounding
(ix) Response to stresses of biotic and abiotic origin
(x) Dormancy

a)

Functions of growth promoters	Functions of growth inhibitors
(i), (ii), (vii), (ix)	(iii), (iv), (v), (vi), (viii), (x)

b)

Functions of growth promoters	Functions of growth inhibitors
(viii), (ix), (x)	(i), (ii), (iii), (iv), (v), (vi), (vii)

c)

Functions of growth promoters	Functions of growth inhibitors
(i), (ii), (iii), (iv), (v), (vi), (vii)	(viii), (ix), (x)

d)

Functions of growth promoters	Functions of growth inhibitors
(i), (ii), (iii), (iv), (v), (vi), (vii), (ix), (x)	(viii)

159. Highest auxin concentration occurs _____.
 a) in growing tips b) in leaves c) at base of plant organs d) in xylem and phloem
160. In the following question, a statement of assertion is followed by a statement of reason.
 Mark the correct choice as :
Assertion: Nutrients are required by plants for the synthesis of protoplasm and act as source of energy.
Reason: Water provides the medium for enzymatic activities needed for growth.
 a) If both assertion and reason are false.
 b) If both assertion and reason are true and reason is the correct explanation of assertion
 c) If both assertion and reason are true but reason is not the correct explanation of assertion.
 d) If assertion is true but reason is false
161. Kinetin, a modified form of adenine was discovered from
 a) autoclaved herring sperm DNA b) coconut milk c) corn kernel d) fungus
162. Bud dormancy is induced by
 a) IAA b) GA c) ABA d) ethylene.
163. Decapitation i.e. removal of shoot tips in a plant usually results in
 a) inactivation of lateral buds b) growth of lateral buds c) cessation of plant growth
 d) yellowing of leaves
164. The term 'antiauxin' refers to
 a) raw material used in the synthesis of auxin
 b) compound which inhibits the action of auxin c) artificially synthesised auxin
 d) active form of auxin
165. Read the given statements and select the correct option.
 (i) One maize root cell can give rise to more than 17,500 cells.
 (ii) A cell in watermelon can increase in size upto 3,50,000 times.
 (iii) The growth of pollen tube is measured in terms of length.
 (iv) The growth of the leaf is measured in term of surface area.
 a) Statements (i) and (ii) are correct. b) Statements (iii) and (iv) are correct.
 c) Statements (i) and (iii) are correct. d) Statements (i), (ii), (iii) and (iv) are correct.
166. Opening of floral buds into flowers, is a type of_____
 a) autonomic movement of variation b) paratonic movement of growth
 c) autonomic movement of growth d) autonomic movement of locomotion
167. During seed germination its stored food is mobilised_____
 a) Cytokinin b) ABA c) Gibberellin d) Ethylene

168. Phytohormone A causes apical dominance while phytohormone B overcomes the same.

Select the option that correctly identifies A and B.

a)

A	B
Auxin	Cytokinin

b)

A	B
Cytokinin	Auxin

c)

A	B
Gibberellin	Cytokinin

d)

A	B
Auxin	Gibberellin

169. What breaks bud dormancy of potato tuber?

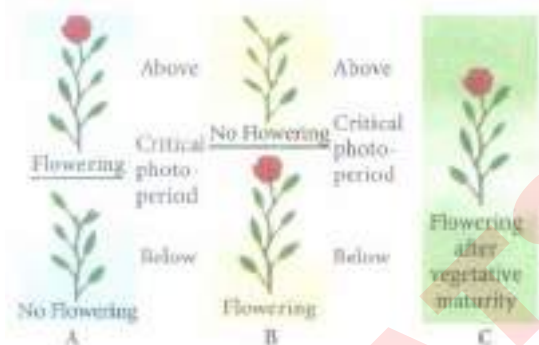
a) Gibberellin b) IAA c) ABA d) Zeatin

170. Which of the following is an example of differentiation?

- a) Lignocellulosic wall thickenings of tracheids
 b) Loss of nucleus, vacuolisation and end wall perforations in sieve tube elements
 c) Elongation, thickening and emptying of sclerenchyma fibres d) All of these

171. The given figure shows flowering responses of three plants A, B and C to the photoperiod.

Select the correct option regarding this.



a)

A	B	C
Long day plant	Day neutral plant	Short day plant

b)

A	B	C
Short day plant	Day neutral plant	Long day plant

c)

A	B	C
Long day plant	Short day plant	Day neutral plant

d)

A	B	C
Short day plant	Long day plant	Day neutral plant

172. Persistent nucellus in the seed is known as _____

a) Perisperm b) Hilum c) Tegmen d) Chalaza

173. The hormone 'X' does the following functions.

- (i) Induces seed dormancy.
 (ii) Inhibits seed germination.
 (iii) Prepares plants to cope with stress.
 (iv) Stimulates closure of stomata.

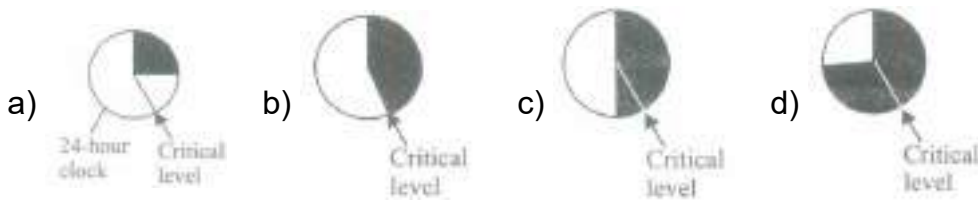
The hormone 'X' should be

a) ABA b) ethylene c) GA d) cytokinins

174. Maryland mammoth tobacco is a short day plant. Its critical duration of darkness is 10 hours.

Under which of the following conditions will it not flower?

[Key: □ Lightperiod ■ Darkperiod]



175. In some plants, the female gamete develops into embryo without fertilization. This phenomenon is known as__

- a) Parthenocarpy b) Syngamy c) Parthenogenesis d) Autogamy

176. Which one of the following acids is a derivative of carotenoids?

- a) Indole-3 -acetic acid b) Gibberellic acid c) Absciscic acid d) Indole butyric acid

177. Read the given statements and select the correct option.

Statement 1 : Elongation of reduced stem is possible due to application of gibberellin hormone.

Statement 2 : Gibberellin stimulates cell division and cell elongation.

- a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.

178. An irreversible or permanent increase in size, mass or volume of a cell, organ or organism is called as _____

- a) growth b) differentiation c) dedifferentiation d) development

179. Photoperiod stimulus is perceived by _____ pigment.

- a) cryptochrome b) cytochrome c) phytochrome d) monochrome

180. Which of the following may be the substitute of vernalisation:

- a) IAA b) GA c) ABA d) NAA

181. What will be the effect on phytochrome in a plant subjected to continuous red light?

- a) Level of phytochrome decreases b) Phytochrome is destroyed
c) Phytochrome synthesis increases
d) Destruction and synthesis of phytochrome remain in equilibrium

182. Which one increases in the absence of light?

- a) Uptake of minerals b) Uptake of water c) Elongation of internodes d) Ascent of sap

183. Plants having little or no secondary growth are____

- a) conifers b) deciduous angiosperms c) grasses d) cycads

184. ABA acts antagonistic to

- a) ethylene b) cytokinin c) gibberellic acid d) IAA.

185. In Xanthium and many grasses seed dormancy occurs due to

- a) Impermeability of seed coats to oxygen b) Impermeability of seed coats to water
c) Immaturity of embryo d) Germination inhibitor.

186. Which among the following is not a function of cytokinins?

- a) Helps to overcome apical dominance b) Essential for cytokinesis during cell division
c) Delays the senescence of leaves d) Helps in fruit ripening

187. Which one of the following is not a synthetic auxin

- a) 2, 4-D b) 2-4-5-T c) NAA d) IAA

188. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: The constantly dividing cells both at the root apex and the shoot apex, show the meristematic phase of growth.

Reason: The cells of this region are rich in protoplasm and are without nuclei.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

189. Fastest phase of S-shaped growth curve is

- a) lag phase b) log phase c) stationary phase d) both (a) and (b).

190. The given figure shows growth of two leaves over the period of one day. If, AG = absolute growth and RGR = relative growth rate, then select the correct option.



a)

AG for leaf A	RGR for leaf A	AG for leaf B	RGR for leaf B
1%	1	2%	2

b)

AG for leaf A	RGR for leaf A	AG for leaf B	RGR for leaf B
100%	5	10%	5

c)

AG for leaf A	RGR for leaf A	AG for leaf B	RGR for leaf B
5	100%	5	10%

d)

AG for leaf A	RGR for leaf A	AG for leaf B	RGR for leaf B
5	100%	5	100

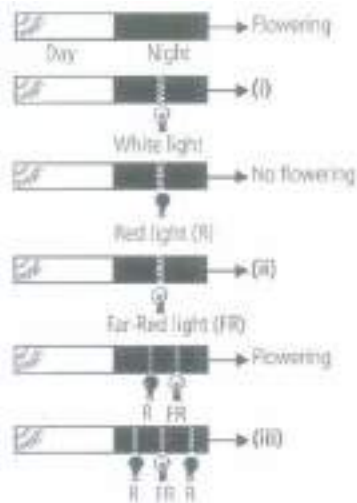
191. Flowering dependent on cold treatment is ____

- a) cryotherapy b) cryogenics c) cryoscopy d) vernalisation

192. Induction of cell division activity and delay in senescence is caused by

- a) gibberellin b) auxin c) cytokinin d) ethylene.

193. Given figure shows the effect of interruption of skotoperiod (dark period) in a short day plant by light of different types.



Select the correct option for (i), (ii) and (iii).

a)

(i)	(ii)	(iii)
Flowering	Flowering	No Flowering

b)

(i)	(ii)	(iii)
No Flowering	No Flowering	Flowering

c)

(i)	(ii)	(iii)
No Flowering	Flowering	No Flowering

d)

(i)	(ii)	(iii)
Flowering	No Flowering	No Flowering

194. The stimulus of cold treatment (vernalisation) is perceived by

- a) leaves b) flowers c) roots d) shoot apices

195. Select the incorrect statement.

- a) Impermeable and hard seed-coat causes seed dormancy.

b)

Effect of inhibitory substances can be removed by subjecting the seeds to gibberellic acid and nitrates.

- c) Immature embryos causes seed dormancy d) None of these

196. The activity of α -amylase in the endosperm of a germinating seed of barley is induced by:

- a) ethylene b) cytokinin c) IAA d) gibberellin

197. What would happen if you forget to add cytokinin to the culture medium?

- a) Callus will not develop shoot buds b) Callus will not develop root buds
c) Callus will stop differentiating d) Both (a) and (b)

198. A primary root grows from 5 cm to 19 cm in a week. Calculate the actual growth rate (AGR) and relative growth rate (RGR) over the period.

a)

AGR	RGR
14 cm	2.8

b)

AGR	RGR
14 cm	3.8

c)

AGR	RGR
3.8 cm	14

d)

AGR	RGR
24 cm	2.8

199. A pigment concerned with both floral induced and seed germination is:

- a) Florigen b) Chlorophyll c) Plastocyanin d) Phytochrome

200. Seed germination is the sprouting of a seed and growth of the embryo present inside the seed into a seedling or young plant capable of independent existence. Refer the given figure showing seed germination and mark the incorrect option.



- a) Cotyledons are brought out of the soil by the greater growth of hypocotyl
b) Cotyledons become green and functional as first leaves of the seedling
c)
The hypocotyl does not elongate much, instead the epicotyl grows and takes the plumule above the soil
d) This kind of germination is found in seeds of beans.
201. In meiosis crossing over is initiated at :-
a) Pachytene b) Leptotene c) Zygotene d) Diplotene
202. Mowing grass lawn facilitates better maintenance because____
a) wounding stimulates regeneration
b) removal of apical dominance and stimulation of intercalary meristem
c) removal of apical dominance
d) removal of apical dominance and promotion of lateral meristem
203. Which of the following movement is not related to auxin level?
a) Bending of shoot towards light b) Movement of root towards soil
c) Nyctinastic leaf movements d) Movement of sunflower head tracking the sun
204. Auxin and cytokinin are antagonistic in which of the following functions?
a) Cell division b) Phototropism c) Apical dominance d) Geotropism
205. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: The difference in shapes of leaves produced in air and those produced in water in buttercup represent the heterophyllous development due to environment.
Reason: The phenomenon of heterophylly is an example of plasticity.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
206. Select the correct option regarding the phytohormone to which the given molecular structure belongs.



- a) The hormone promotes femaleness in most flowers.
b) The hormone promotes apical dominance.
c) The hormone usually decreases the size of stem, leaves, flowers and fruits.
d) The hormones breaks seed dormancy by synthesis of certain enzymes
207. Reversal of dwarfism is achieved by using
a) Gibberellin b) Cytokinin c) Vernalin d) Ethylene
208. Movement of auxin is _____.
a) centripetal b) basipetal c) acropetal d) Both (b) and (c)
209. Read the following statements regarding arithmetic growth and select the correct answer.
(i) Rate of growth is constant.
(ii) One daughter cell remains meristematic while the other one differentiates and matures.
(iii) Mathematical expression is $L_t = L_0 + rt$.
a) Statements (i) and (ii) are correct b) Statements (ii) and (iii) are correct
c) Statements (i) and (iii) are correct. d) All statements are correct.
210. If a part of pith from the stem of a plant is used as an explant and cultured on nutrient medium, which of the following processes is responsible for the formation of an undifferentiated mass of cells called callus?
a) Growth b) Differentiation c) Dedifferentiation d) Redifferentiation
211. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: Decapitation is widely used in tea plantation and hedge-making.
Reason: Removal of shoot tips usually results in the growth of lateral buds.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
212. The most widely used compound as a source of C_2H_4 is
a) kinetin b) zeatin c) IBA d) ethephon
213. A farmer while growing grape plants in his garden, observes the following:
(i) Fruit size normally remained small.
(ii) Natural seed abortion.
(iii) Reduced stem and leaf growth.
Which problems could be solved by application of gibberellic acid during the development of fruits?
a) (i) and (ii) b) (i) and (iii) c) (i), (ii) and (iii) d) None of these
214. The exponential growth can be mathematically expressed as
a) $L_t = L_0 + rt$ b) $W_1 = W_0 + e^{rt}$ c) $W_1 = W_0 e^{rt}$ d) $L_t = L_0 - rt$
215. What causes a green plant exposed to the light on only one side, to bend toward the source of light as it grows?
a) Green plants seek light because they are phototropic
b) Light stimulates plant cells on the lighted side to grow faster.

- c) Auxin accumulates on the shaded side, stimulating greater cell elongation there
d) Green plants need light to perform photosynthesis
216. Who isolated auxins from tips of coleoptiles of oat seedlings?
a) Darwin and Darwin b) Went c) Skoog et al d) Kurosawa
217. Thiobacillus is a group of bacteria helpful in carrying out_____
a) Chemoautotrophic -fixation b) Nitrification c) Denitrification d) Nitrogen fixation
218. Dwarfness can be controlled by treating the plant with _____.
a) cytokinin b) gibberellic acid c) auxin d) antigibberellin
219. Leaves of many grasses are capable of folding and unfolding because they _____.
a) are very thin b) are isobilateral c) have specialised bulliform cells
d) have parallel vascular bundles
220. If a rotten fruit gets mixed with unripe fruits, the unripe fruits will
a) also be rotten b) ripe quickly c) remain unchanged d) none of these
221. Which of the following is both a growth promoter as well as a growth inhibitor?
a) Auxin b) Gibberellic acid c) ABA d) Ethylene
222. Select the incorrect statement among the following.
a) Increase in growth per unit time is growth rate.
b)
A sigmoid growth curve is a characteristic of most living organisms in their natural environment
c) Rate of growth is constant during geometrical growth.
d) Exponential phase is also called as log phase.
223. The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is:-
a) Differentiating b) Maturing c) Maturing d) Widening
224. The hormone which reduces transpiration rate by inducing stomatal closure is
a) ABA b) ethylene c) cytokinin d) gibberellin
225. Cytokinins are mostly
a) glucosides b) phenolics c) amino purines d) organic acids.
226. Cell elongation in internodal regions of the green plants takes place due to_____
a) indole acetic acid b) cytokinins c) gibberellins d) ethylene
227. The photoperiod in plants is perceived at
a) meristem b) flower c) floral buds d) leaves.
228. Read the given statements and select the correct option.
Statement 1: Ethylene is a gaseous hormone.
Statement 2: Ethylene causes climacteric ripening of fruits.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

229. Which phytohormone would you use if you are asked to 'bolt' a rosette plant?

- a) Auxins b) Gibberellins c) Cytokinins d) Any of these

230. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Natural auxin	(i) NM
B. Synthetic auxin	(ii) Zeatin
C. Bakane disease of rice	(iii) IAA
D. Natural cytokinin	(iv) GA
	(v) Kinetin

- a) A-(iii), B-(i), C-(iv), D-(ii) b) A-(i), B-(iii), C-(iv), D-(v) c) A-(iii), B-(i), C-(iv), D-(v)
d) A-(iv), B-(i), C-(v), D-(ii)

231. Phytohormones are _____.

- a) chemicals regulating flowering b) chemicals regulating secondary growth
c) hormones regulating growth from seed to adulthood
d) regulators synthesised by plants and influencing physiological Processes

232. Select the pair that consists of plant growth promoters only.

- a) Auxins and cytokinins b) Gibberellins and ABA c) Ethylene and ABA d) All of these

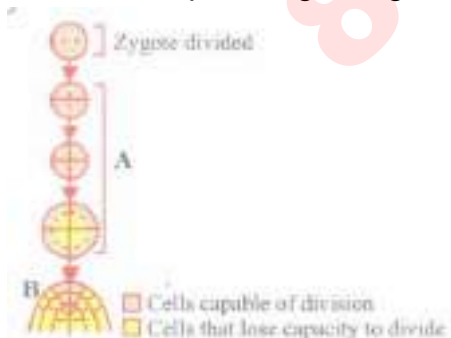
233. Removal of auxin source demonstrates that leaf abscission is by _____ auxin, and apical dominance is by _____ auxin.

- a) promoted, promoted b) inhibited, inhibited c) promoted, inhibited
d) inhibited, promoted

234. How does pruning help in making the hedge dense?

- a) It frees axillary buds from apical dominance.
b) The apical shoot grows faster after pruning. c) It releases wound hormones.
d) It induces the differentiation of new shoots from the rootstock

235. The given figure shows development of an embryo that undergoes two phases A and B. Select the correct option regarding it.



a)

A	B
Geometric phase	Arithmetic phase

b)

A	B
Arithmetic phase	Geometric phase

c)

A	B
Arithmetic phase	Exponential phase

d)

A	B
Exponential phase	Stationary phase

236. Spraying sugarcane with gibberellins increases the yield by as much as 20 tonnes per acre. GA performs it by
a) improving the quality of fruit b) increasing sugar content c) internodal elongation
d) delaying senescence.
237. Linkage is a tendency of alleles of different genes to assort together in:-
a) Meiosis b) Mitosis c) X-Y linkage d) Inversion
238. Hormone responsible for ageing is
a) GA b) IAA c) ABA d) cytokinin
239. The factors which influence growth are
a) nutrients b) water, oxygen c) light, temperature d) all of these
240. To increase sugar production in sugarcane, they are sprayed with
a) IAA b) cytokinin c) gibberellin d) ethylene.
241. The pigment, that absorbs red and far-red light in plants is____
a) xanthophyll b) cytochrome c) phytochrome d) carotene
242. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: Development is the sum of growth and differentiation.
Reason: Development in plants is under the control of extrinsic factors only.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
243. Senescence as an active developmental cellular process in the growth and functioning of a flowering plant, is indicated in____
a) vessels and tracheid differentiation b) leaf abscission c) annual plants d) floral parts
244. In tea plantations and hedge making, gardeners trim the plants regularly so that they remain bushy. Scientific explanation behind this is
a) removal of apical dominance b) growth of lateral buds c) suppression of lateral buds
d) both (a) and (b)
245. Plasticity in plant growth means that
a) plant roots are extensible b) plant development is dependent on the environment
c) stems can extend d) none of the above.
246. Klinostat is employed in the study of____
a) osmosis b) growth movements c) photosynthesis d) respiration
247. Seed dormancy is due to the____
a) ethylene b) abscisic acid c) IAA d) starch
248. Growth at cellular level, is principally a consequence of increase in the amount of
a) protoplasm b) DNA c) cell wall d) cell organelles
249. In plant tissue culture experiments, high auxin to cytokinin ratio favours _____ development and high cytokinin to auxin ratio favours _____ development.
a) root, shoot b) shoot, root c) root, root d) shoot, shoot

250. The term synergistic action of hormones refers to

- a) when two hormones act together but bring about opposite effects
- b) when two hormones act together and contribute to the same function.
- c) when one hormone affects more than one function.
- d) when many hormones bring about anyone function

WHATSAPP
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RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

DIGESTION AND ABSORPTION 1

Marks : 800

1. Digestion of proteins begins in the _____ and digestion of polysaccharides begins in the _____.

- a) _____ b) _____ c) _____ d) _____
(i) (ii) (i) (ii) (i) (ii) (i) (ii)
mouth stomach stomach small intestine stomach mouth stomach stomach

2. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Salivary amylase	(i) Proteins
B. Bile salts	(ii) Milk proteins
C. Rennin	(iii) Starch
D. Pepsin	(iv) Lipids

- a) A-(iii), B-(iv), C-(ii), D-(i) b) A-(iii), B-(iv), C-(i), D-(ii) c) A-(iv), B-(iii), C-(ii), D-(i)
d) A-(i), B-(ii), C-(iii), D-(iv)

3. A patient is generally advised to specially consume more meat, lentils, milk and eggs in diet only when he suffers from _____.

- a) Scurvy b) Kwashiorkor c) Rickets d) Anemia

4. Read the following statements and select the correct option.

Statement 1: The glycogen of the liver is the principal source of blood sugar in case of emergency.

Statement 2: Blood sugar level falls rapidly after hepatectomy.

- a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.

5. Two friends are eating together on a dining table. One of them suddenly starts coughing while swallowing some food. This coughing would have been due to improper movement of

- a) epiglottis b) diaphragm c) neck d) tongue

6. Which of the following statements regarding small intestine are incorrect?

- (i) Throughout the small intestine, there are crypts of Lieberkuhn at the base of the villi.
(ii) In duodenum, there are, in addition, small rounded peptic glands.
(iii) The small intestine is strongly self-protective, by means of a copious production of mucus

and a mechanism for the rapid replacement of cells damaged by contact with food and digestive juices.

(iv) Each villus is richly supplied with blood capillaries only.

a) (i) and (iv) b) (ii) and (iv) c) (iii) and (iv) d) (i) and (ii)

7. Anxiety and eating spicy food together in an otherwise normal human, may lead to_____

a) Indigestion b) Jaundice c) Diarrhoea d) Vomiting

8. Which of the following statements are correct regarding secretion of oxyntic cells?

(i) It denatures proteins and softens fibrous connective tissues in the blood.

(ii) It activates rennin.

(iii) It has a role in maturation of RBCs.

(iv) It activates trypsin.

a) (i) and (iv) b) (ii), (iii) and (iv) c) (i), (ii) and (iii) d) (i), (ii) and (iv)

9. Which of the following is incorrectly represented?

a) $\text{Proteins} \xrightarrow{\text{Trypsin/Chymotrypsin}} \text{dipeptides}$ b) $\text{Nucleic acids} \xrightarrow{\text{Nucleotidases}} \text{nucleotides}$

c) $\text{Fats} \xrightarrow{\text{Lipases}} \text{di/monoglycerides}$ d) $\text{Starch} \xrightarrow{\text{Salivary amylase}} \text{maltose}$

10. Various types of movements are generated by the_____layer of the small intestine

a) serosa b) muscularis c) mucosa d) submucosa

11. A young infant may be feeding entirely on mother's milk which is white in colour but the stools which the infant passes out is quite yellowish. What is this yellow colour due to?

a) Pancreatic juice poured into the duodenum b) Intestinal juice

c) Bile pigments passed through bile juice d) Undigested milk protein casein

12. In which layer of stomach are gastric glands located?

a) Serosa b) Mucosa c) Submucosa d) Muscularis mucosa

13. Read the following statements and select the correct option.

Statement 1 :The human small intestine is the longest portion in the alimentary canal.

Statement 2 :Absorption of digested food requires a very large surface area.

a) Both statements 1 and 2 are correct

b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct

d) Both statements 1 and 2 are incorrect.

14. Which group of three of the following five statements (A-E) contain is all three correct statements regarding beri-beri?

(A) a crippling disease prevalent among the native population of sub-Saharan Africa;

(B) a deficiency disease caused by lack of thiamine (vitamin B₁)

(C) a nutritional disorder in infants and young children when the diet is persistently deficient in essential protein

(D) occurs in those countries where the staple diet is polished rice;

(E) the symptoms are pain from neuritis, paralysis, muscle wasting, progressive oedema, mental deterioration and finally heart failure

a) B, D and E b) A, B and D c) A, C and E d) B, C and E

15. Consider the following statements each with one or two blanks.

(i) The bile duct and the pancreatic duct open together into the duodenum as the ____ (i) ____ which is guarded by a sphincter called the ____ (ii) ____

(ii) ____ (iii) ____ is a proteolytic enzyme found in gastric juice of infants which helps in the digestion of milk proteins.

(iii) Fatty acids and glycerol being insoluble, cannot be absorbed into the blood. They are first incorporated into small droplets called ____ (iv) ____ which move into the intestinal mucosa. They are re-formed into very small protein coated fat globules called the ____ (v) ____ which are transported into the lymph vessels (lacteals) in the villi.

Which of the following options gives the correct fill ups for the respective blanks in the above statements?

- (1) - common bile duct, (3) - Rennin, (2) - phincter of Oddi,
(2) - sphincter of Boyden, (4) - chyme, (4) - micelles,
a) (3) - Pepsin b) (5) - micelle c) (5) - chylomicrons
(3) - Casein,
(4) - chylomicrons,
d) (5) - micelles

16. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Gastrectomy can lead to iron-deficiency or anaemia

Reason: HCl of gastric juice converts Fe^{3+} into Fe^{2+} which makes iron absorbable.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.

17. Ejection of stomach contents through the mouth is called _____

- a) diarrhoea b) constipation c) vomiting d) indigestion

18. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Mucosal epithelium of gut has goblet cells which secrete mucus

Reason : The mucus in the gastric and pancreatic juice protects the mucosa from excoriation by acidic secretion.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.

19. Which part of body secretes the hormone secretin?

- a) Oesophagus b) Duodenum c) Stomach d) Ileum

20. Carrier ions like Na^+ facilitate the absorption of substances like:

- a) amino acids and glucose b) glucose and fatty acid c) fatty acids and glycerol
d) fructose and some amino acids

21. Cholecystokinin and duocrinin are secreted by _____

- a) adrenal cortex b) thyroid gland c) pancreas d) intestine

22. Which of the following match is correct?

- a) Renin - Protein b) Trypsin - Starch c) Invertase - Sucrose d) Amylase - Lactose

23. Hepato-pancreatic duct opens into the duodenum and carries

- a) bile b) pancreatic juice c) both bile and pancreatic juice d) saliva.

24. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Trypsinogen is activated by enterokinase into active trypsin which in turn activates other enzymes in the pancreatic juice.

Reason: The pancreatic juice contains inactive enzymes which are activated by intestinal juice.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

25. Digestion of food involves breaking down of food components into smaller molecules by enzymes. These enzymes are active only at certain hydrogen ion concentrations. As a result, certain food combinations can facilitate or retard the process of digestion. Of the following combinations, one that can result in very efficient digestion is

- a) meal with high proteins and acid fruits b) meal with high starch and high proteins
c) meal with high starch and acid fruits d) meal with high fat and high proteins

26. Secretin and cholecystikinin are digestive hormones. They are secreted in ____

- a) Pyloric stomach b) Duodenum c) Ileum d) Oesophagus

27. Mark the odd one in each series and select the correct option.

- (i) Villi, Brunner's glands, crypts of Lieberkuhn, gastric glands
(ii) Pepsin, lipase, trypsin, rennin
(iii) Bile salts, bile pigments, gall bladder, gastric juice

a)

(i)	(ii)	(iii)
Gastric glands	Lipase	Gastric juice

b)

(i)	(ii)	(iii)
Villi	Rennin	Gall bladder

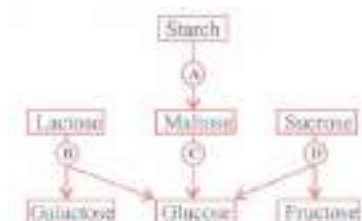
c)

(i)	(ii)	(iii)
Brunner's glands	Trypsin	Bile pigments

d)

(i)	(ii)	(iii)
Crypts of Lieberkuhn	Pepsin	Bile salts

28. The given flowchart shows the fate of carbohydrates during digestion in the human alimentary canal. Identify the enzymes acting at stages indicated as A, B, C and D and select the correct option.



- a) A - amylase, B - maltase, C - lactase, D - invertase
b) A - amylase, B - maltase, C - invertase, D - lactase

c) A - amylase, B - invertase, C - maltase, D - lactase

d) A - amylase, B - lactase, C - maltase, D - invertase

29. The site of action and substrate of rennin are respectively

a) mouth and starch b) small intestine and protein c) stomach and casein

d) stomach and fat

30. Match the enzymes with their respective substrates and choose the right one among options given.

Column I	Column II
A. Lipase	(i) Dipeptides
B. Nuclease	(ii) Fats
C. Carboxypeptidase	(iii) Nucleic acids
D. Dipeptidases	(iv) Proteins, peptones and proteoses

a) A-(ii), B-(iii), C-(i), D-(iv) b) A-(iii), B-(iv), C-(ii), D-(i) c) A-(iii), B-(i), C(iv), D-(ii)

d) A-(ii), B-(iii), C-(iv), D-(i)

31. In man the zymogen or chief cells are mainly found in _____

a) cardiac part of stomach b) pyloric part of stomach c) duodenum

d) fundic part of stomach

32. Which of the options given below would not correctly fills the blanks in the following sentence?

In order to absorb and use _____ by the body, these must be broken down by hydrolysis into _____.

a) monosaccharides, polysaccharides b) proteins, amino acids

c) glycerol, fatty acids and fats d) monosaccharides, disaccharides

33. Gastric juice of infants contains _____

a) nuclease, pepsinogen, lipase b) pepsinogen, lipase, rennin

c) amylase, rennin, pepsinogen d) maltase, pepsinogen, rennin

34. Mark the right statement among the following.

a) Trypsinogen is an inactive enzyme. b) Trypsinogen is secreted by intestinal mucosa

c) Enterokinase is secreted by pancreas d) Bile contains trypsin

35. A and B in the given graph are the action spectra of the two enzymes. The two enzymes are



a) A: amylase B : trypsin b) A: pepsin B : trypsin c) A: chymotrypsin B : rennin

d) A: lactate dehydrogenase B: amylase

36. A person who is one along hunger strike and is surviving only on water, will have _____.

a) less amino acids in his urine b) more glucose in his blood c) less urea in his urine

d) more sodium in his urine

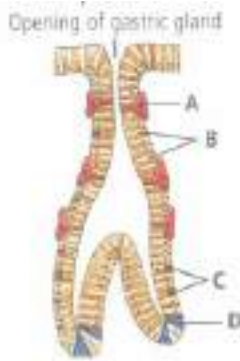
37. Epithelial cells of the intestine involved in food absorption have on their surface _____

a) pinocytotic vesicles b) microvilli c) zymogen granules d) phagocytic vesicles

38. Which of the following statements are incorrect about chylomicrons?

- (i) Chylomicrons are produced in the epithelial cells of small intestine.
 - (ii) It contains triglycerides, cholesterol and phospholipids.
 - (iii) They are protein coated small vesicles.
 - (iv) Chylomicrons are released from the epithelial cell into lacteals
- a) (i) and (iv) b) (ii) and (iii) c) (i), (ii), (iii) and (iv) d) None of these

39. Examine the figure of gastric gland given below and identify the labelled parts A to D.



a)

A	B	C	D
Oxyntic cell	Chief cell	Mucous cell	Argentaffin cell

b)

A	B	C	D
Argentaffin cell	Oxyntic cell	Mucous cell	Chief cell

c)

A	B	C	D
G cell	Chief cell	Mucous cell	Argentaffin cell

d)

A	B	C	D
Oxyntic cell	G cell	Mucous cell	Chief cell

40. Stenson's duct is associated with

- a) parotid gland b) cardiac gland c) pancreatic gland d) thyroid gland

41. If the inner surface of the ileum in the human small intestine was smooth, rather than being folded and subdivided into villi, which of the following statements would be true?

a)

The rate of absorption of digested food molecules would be higher, because the digested food would pass more easily through the digestive tract.

b)

Digestion would not be as effective, because there would be fewer cells secreting trypsin (a proteindigesting enzyme)

c)

Humans would have needed to evolve a much longer small intestine to absorb sufficient nutrients from their food

d)

Humans would not be able to survive, because the digestive tract would be more susceptible to damage.

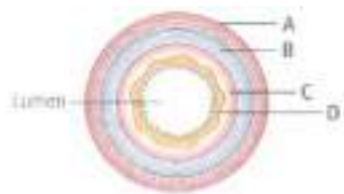
42. The back flow of faecal matter from the large intestine into the small intestine is prevented by the presence of

- a) epiglottis b) sphincter of Oddi c) ileo-caecal valve d) gastro-oesophageal sphincter.
43. Which of the following is not the function of large intestine?
a) Absorption of water b) Nutrient absorption c) Secretion of mucus to lubricate faeces
d) Temporary storage of faeces in rectum
44. Which of the following options best represents the enzyme composition of pancreatic juice?
a) Amylase, peptidase, trypsinogen, rennin b) Amylase, pepsin, trypsinogen, maltase
c) Peptidase, amylase, pepsin, rennin
d) Lipase, amylase, trypsinogen, procarboxypeptidase
45. If this enzyme is absent in our small intestine, digestion of proteins in our body would be severely affected. Identify the enzyme
a) Pancreatic amylase b) Maltase c) Lipase d) Enterokinase
46. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion : Starch in the chyme is hydrolysed by pancreatic amylase into glucose molecules
Reason: About 70 per cent of the starch is hydrolyzed in oral cavity by salivary amylase
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
47. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Caecum is a small blind sac which hosts some symbiotic microorganisms
Reason : Escherichia coli in return produces vitamin B12, vitamin K, thiamine and riboflavin.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
48. Which of the following statements is false?
a) The stomach stores the food for 1-2 hours
b) Gastric gland never secretes even a small amount of lipase.
c) Rennin, a proteolytic enzyme is found in gastric juice of infants d) All of these
49. Which of the following correctly depicts the dental formula of a child?
a) $\frac{2112}{2112}$ b) $\frac{2102}{2102}$ c) $\frac{2123}{2123}$ d) $\frac{2111}{2111}$
50. Pepsin converts proteins into _____
a) rennin b) proteoses and peptones c) amino acids d) ipase
51. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Fat is restricted in the diet of a person who has undergone an operation to remove gall bladder.
Reason : The gall bladder stores lipases which are released in small intestine for digestion.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
52. A dental disease characterised by molting of teeth is due to the presence of a certain chemical element in drinking water. Which of the following is that element?
a) Mercury b) Chlorine c) Fluorine d) Boron
53. If pancreas is removed, the compound which remain undigested is ____
a) carbohydrates b) fats c) proteins d) All of these
54. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion : The sight, smell and presence of food in the oral cavity can stimulate secretion of saliva.
Reason : The activities of the gastro-intestinal tract are only under neural control for proper coordination of different parts
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
55. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion : Oesophagus pierces the diaphragm and enters the abdominal cavity
Reason : Peristaltic movement starts from oesophagus
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
56. Match column I with column II and select the correct option from the given codes
- | Column I | Column II |
|-------------------------|----------------------------|
| A. Hepatic lobule | (i) Base of villi |
| B. Crypts of Leiberkuhn | (ii) Glisson's capsule |
| C. Sphincter of Oddi | (iv) Gall bladder |
| D. Cystic duct | (v) Hepato-pancreatic duct |
- a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(i), B-(ii), C-(iv), D-(iii) c) A-(i), B-(ii), C-(iii), D-(iv)
d) A-(iv), B-(iii), C-(ii), D-(i)
57. Most of the fat digestion occurs in _____.
a) rectum b) stomach c) duodenum d) small intestine
58. Brunner's gland is present in
a) liver b) duodenum c) oesophagus d) stomach.
59. Which one of the following pairs is not correctly matched?
a) Vitamin B₁₂ - pernicious anaemia b) Vitamin B₆ - Loss of appetite
c) Vitamin B₁ - Beri-beri d) Vitamin B₃ - Pellagra

60. Consider the following four statements and select the correct option stating which ones are true (T) and which ones are false (F).
- (i) The stomach has the lowest pH.
(ii) The liver contains lipid emulsifier.
(iii) Large intestine secretes many enzymes.
(iv) All proteases function in the lumen of small intestine
- | | | | |
|---------------------|---------------------|---------------------|---------------------|
| a) | b) | c) | d) |
| (i) (ii) (iii) (iv) | (i) (ii) (iii) (iv) | (i) (ii) (iii) (iv) | (i) (ii) (iii) (iv) |
| T F T F | F T F T | F F T T | T T F F |
61. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** Products of digestion are absorbed in the large intestine
Reason: The mucosal lining of large intestine forms finger-like foldings called villi which aid in absorption.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.
62. In which of the following order, the process of digestion proceeds?
- a) Digestion → Ingestion → Absorption → Assimilation → Egestion
b) Digestion → Ingestion → Assimilation → Absorption → Egestion
c) Ingestion → Digestion → Assimilation → Absorption → Egestion
d) Ingestion → Digestion → Absorption → Assimilation → Egestion
63. In man, the gall bladder is situated in _____ lobe of liver
- a) left b) right c) caudate d) quadrate
64. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** Bile is not a true digestive juice.
Reason: Bile lacks digestive enzymes
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If assertion is true but reason is false
65. Which of the following statements is incorrect?
- a) Mucosal epithelium has goblet cells which secrete mucus for lubrication
b)
Mucosa forms gastric glands in the stomach and crypts in between the bases of villi in intestine
c) Cells lining the villi has brush border or microvilli
d)
All the four basic layers in the wall of gut never show modifications in different parts of the alimentary canal

66. The food mixes thoroughly with the acidic gastric juice of the stomach by the churning movements of its muscular wall. What do we call the food then?
a) Bolus b) Chyme c) Succus entericus d) Chylomicrons
67. Which of the following has minimum pH?
a) Bile b) Gastric juice c) Saliva d) Pancreatic juice
68. Liver is the largest gland and is associated with various functions, choose one which is not correct.
a) Metabolism of carbohydrate b) Digestion of fat c) Formation of bile
d) Secretion of hormone called gastrin
69. Major utility of breaking up of food into small bits during chewing is
a) to reduce surface area of the food eaten up
b) to increase surface area of the food eaten up c) to make the food soluble
d) to enjoy taste of food.
70. The given diagram represents the IS. of gut. Identify A, B, C and D.



a)

A	B	C	D
Serosa	Muscularis	Submucosa	Mucosa

b)

A	B	C	D
Muscularis	Serosa	Submucosa	Mucosa

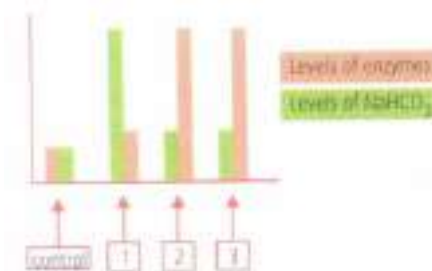
c)

A	B	C	D
Serosa	Muscularis	Mucosa	Submucosa

d)

A	B	C	D
Serosa	Submucosa	Muscularis	Mucosa

71. Calcium deficiency occurs in the absence of vitamin_____
a) D b) C c) E d) B
72. Select the incorrect statement.
a) Lipases and nucleases are not present in pancreatic juice.
b) Goblet cells secrete mucus c) Brunner's glands are sub-mucosal glands.
d) Carboxypeptidase catalyses conversion of proteins peptones and proteoses to dipeptides
73. Effect of some compounds (present in partially digested food) on pancreatic secretion is depicted in the bar graph. Compounds 1, 2 and 3 represent:



a)

1	2	3
Acid	Fat	Salt

b)

1	2	3
Salt	Peptone	Fat

c)

1	2	3
Acid	Fat	Peptone

d)

1	2	3
Pepsin	Acid	Fat

74. The enzyme enterokinase helps in conversion of_____
- a) caseinogen into casein b) Pepsinogen into pepsin c) Protein into polypeptides
d) Trypsinogen into trypsin
75. Which one of the following is a matching pair of a substrate and its particular digestive enzyme?
- a) Maltose - Maltase b) Lactose - Rennin c) Starch - Steapsin
d) Casein - Chymotrypsin
76. Read the following statements and select the correct option.
- Statement 1** : The second largest digestive gland in our body is pancreas.
Statement 2 : Pancreas functions both as an exocrine and endocrine gland
- a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
77. Which of the following statements is not correct?
- a) Goblet cells are present in the mucosa of intestine and secrete mucus
b) Oxyntic cells are present in the mucosa of stomach and secrete HCl
c) Acini are present in the pancreas and secrete carboxypeptidase
d) Brunner's glands are present in the submucosa of stomach and secrete pepsinogen
78. Match the two columns and select the correct among options given.
- | Column I | Column II |
|------------------------------|---|
| A. Biomacromolecules of food | (i) Alimentary canal and associated gland |
| B. Human digestive system | (ii) Embedded in jawbones |
| C. Stomach | (iii) Outer wall of visceral organs |
| D. Thecodont | (iv) Converted into simple substances |
| E. Serosa | (v) J-shaped bag like structure |
- a) A-(ii), B-(i), C-(v), D-(iii), E-(iv) b) A-(iv), B-(i), C-(v), D-(ii), E-(iii)
c) A-(i), B-(ii), C-(iii), D-(iv), E-(v) d) A-(i), B-(iii), C-(ii), D-(iv), E-(v)
79. Crypts of Lieberkuhn are present in
- a) pancreas and secrete pancreatic juice b) small intestine and secrete digestive enzymes
c) stomach and secrete dilute HCl d) stomach and secrete trypsin
80. Consider the following four statements and select the correct option stating which ones are true (T) and which ones are false (F).
- (i) Salivary amylase hydrolyses proteins to amino acids.
(ii) Pancreatic amylase hydrolyses polysaccharides to disaccharides.
(iii) Enteropeptidase activates pepsinogen to pepsin.
(iv) Trypsin coagulates the milk protein casein.

a)

(i)	(ii)	(iii)	(iv)
T	T	F	F

b)

(i)	(ii)	(iii)	(iv)
F	T	F	T

c)

(i)	(ii)	(iii)	(iv)
F	T	F	F

d)

(i)	(ii)	(iii)	(iv)
F	T	F	F

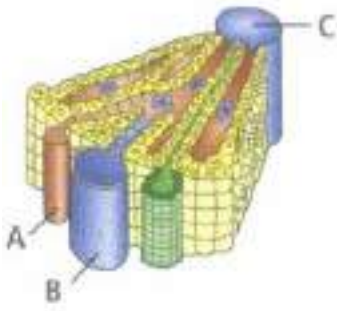
81. A lubricant mucin, in saliva is made up of
 a) polyunsaturated fats b) actin and myosin c) glycoproteins d) phospholipids
82. For person suffering from high blood cholesterol, the physicians recommend_____
 a) pure 'deshi ghee' or butter b) vegetable oil such as groundnut oil
 c) red meat with layers of fats d) vanaspati margarine
83. The common bile duct in human is formed by the joining of
 a) pancreatic duct and bile duct b) cystic duct and hepatic duct
 c) cystic duct and pancreatic duct d) hepatic duct and pancreatic duct.
84. Match column I with column II and select the correct option from the given codes.

Column I (Sphincter)		Column II(location)
A. Sphincter ani internus	(i)	Opening of hepatopancreatic ampulla into duodenum
B. Cardiac sphincter	(ii)	Between duodenum and posterior stomach
C. Sphincter of Oddi	(iii)	Guarding the terminal part of alimentary canal
D. Ileocaecal sphincter	(iv)	Between oesophagus and anterior stomach
E. Pyloric sphincter	(v)	Between small intestine and large intestine

- a) A-(iii). B-(ii), C-(iv). D-(i), E-(v) b) A-(ii), B-(v), C-(i), D-(iv). E-(iii)
 c) A-(iii), B-(iv), C-(i), D-(v), E-(ii) d) A-(iv), B-(iii), C-(i), D-(ii), E-(v)
85. A baby boy aged two years is admitted to play school and passes through a dental check - up. The dentist observed that the boy had twenty teeth. which teeth were absent?
 a) canines b) pre-molars c) Molars d) Incisors
86. Lysozyme that is present in perspiration, saliva and tears, destroys _____.
 a) certain types of bacteria b) all viruses c) most virus-infected cells d) certain fungi
87. The hormone that stimulates the stomach to secrete gastric juice is _____.
 a) gastrin b) renin c) enterokinase d) enterogasterone
88. The given dissection figure shows the blood vessels in liver tissue. The three main blood vessels are indicated by capital letters (A-C). Following statements describe properties of blood that flows through these blood vessels. For each description, indicate the vessel where that blood would be found.
 I. Blood with the highest oxygen content.

II. Blood that contains newly absorbed nutrients.

III. Deoxygenated blood.



- a) I-A, II-C, III-B b) I-A, II-B, III-C c) I-C, II-A, III-B d) I-C, II-B, III-A

89. Read the following statements and select the correct option.

Statement 1 : Dental formula gives the number of teeth in the half of each jaw.

Statement 2 : Dental formula can be expressed for insectivorous mammals as well as for the nonmammalian vertebrates.

- a) Both statements 1 and 2 are correct.
 b) Statement 1 is correct but statement 2 is incorrect.
 c) Statement 1 is incorrect but statement 2 is correct.
 d) Both statements 1 and 2 are incorrect.

90. Which of the following is not a salivary gland?

- a) Sublingual b) Submaxillary c) Lacrimal d) Parotid

91. In man even though both air and food go through the pharynx, food does not normally enter the wind pipe because during swallowing of food

- a) the epiglottis covers the glottis b) sphincter of Oddi closes the hepato-pancreatic duct
 c) pyloric sphincter covers the opening of stomach into the duodenum d) none of these

92. Match the two columns and select the right one among options given.

Column I	Column II
A. Duodenum	(i) A cartilaginous flap
B. Epiglottis	(ii) Small blind sac
C. Glottis	(iii) 'C' shaped structure emerging from the stomach
D. Caecum	(iv) Opening of wind pipe

- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(iv), B-(iii), C-(ii), D-(i) c) A-(iii), B-(i), C-(iv), D-(ii)
 d) A-(ij), B-(iv), C-(i), D-(iii)

93. Inhibition of gastric and stimulation of gastric, pancreatic and bile secretions are controlled by hormones _____.

- a) gastrin, secretin, enterokinase and cholecystokinin
 b) enterogasterone, gastrin, pancreozymin and cholecystokinin
 c) gastrin, enterogasterone, cholecystokinin and pancreozymin
 d) secretin, enterogasterone, gastrin and enterokinase

94. In the stomach, gastric acid is secreted by the:

- a) Parietal cells b) Peptic cells c) Acidic cells d) Gastrin secreting cells

95. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

Assertion: Human beings have two sets of teeth during their life.

Reason: Human beings have thecodont dentition.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false.

96. Glands of the gut are of three types as shown in the figure.



Classify the following examples of glands under X, Y and Z

- (i) Salivary gland (ii) Liver
 (iii) Crypts of Lieberkuhn (iv) Brunner's gland
 (v) Pancreas (vi) Gastric gland

a)

X	Y	Z
(i)(ii)(v)	(iv)(iii)(vi)	

b)

X	Y	Z
(iii)(iv)(v)	(vi)(i)(ii)	

c)

X	Y	Z
(iii)(v)(i)	(ii)(iv)(vi)	

d)

X	Y	Z
(i)(ii),(v)(iv)		(iii)(vi)

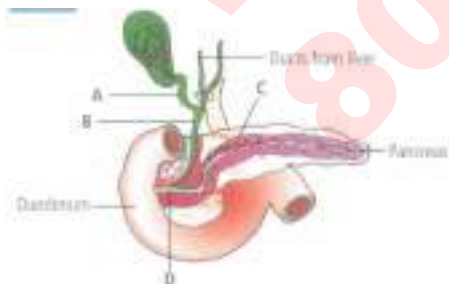
97. Secretion of gastric juice is stopped by _____

- a) gastrin b) Pancreozymin c) cholecystokinin d) enterogasterone

98. One of the constituents of the pancreatic juice which is poured into the duodenum in humans is:

- a) Trypsinogen b) Chymotrypsin c) Trypsin d) Enterokinase

99. The given diagram shows a duct system of liver, gall bladder and pancreas. Write the names of ducts from A to D



- a) A - Cystic duct, B- Common bile duct, C- Pancreatic duct, D - Hepatopancreatic duct
 b) A - Common bile duct, B- Cystic duct, C- Pancreatic duct, D - Hepatopancreatic duct
 c) A - Cystic duct, B - Bile duct, C - Hepatopancreatic duct, D - Pancreatic duct
 d) A - Cystic duct, B - Pancreatic duct, C - Common bile duct, D - Hepatopancreatic duct

100. Fructose is absorbed into the blood through mucosa cells of intestine by the process called _____

- a) active transport b) facilitated transport c) simple diffusion
 d) co - transport mechanism

101. Emaciation of the body, thinning of limbs, skin becoming dry, thin and wrinkled, impairment of growth and development of brain and mental faculties in infants less than a year in age occurs in _____

- a) Kwashiorkor b) marasmus c) constipation d) jaundice

102. Match the following structures with their respective location in organs

(A) crypts of Lieberkuhn	Pancreas
(B) Glisson's Capsule	Duodenum
(C) Islets of Langerhans	Small intestine
(D) Brunner's Glands	Liver

Select the correct option from the following

- a) (ii),(iv),(i),(iii) b) (iii),(iv),(i),(ii) c) (iii),(ii),(i),(iv) d) (iii),(i),(ii),(iv)

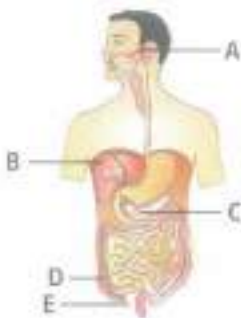
103. Which of the following guards the opening of hepatopancreatic duct into the duodenum?

- a) Ileocaecal valve b) Pyloric sphincter c) Sphincter of Oddi d) Semilunar valve

104. The haemorrhagic disease of new born is caused due to the deficiency of _____

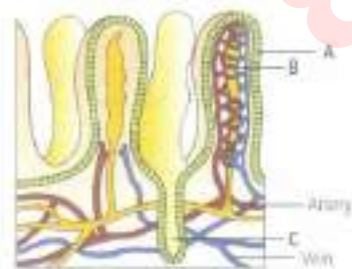
- a) vitamin - A b) vitamin - B₁ c) vitamin - B₁₂ d) vitamin - K

105. The given figure represents the human digestive system. Identify A, B, C, D and E.



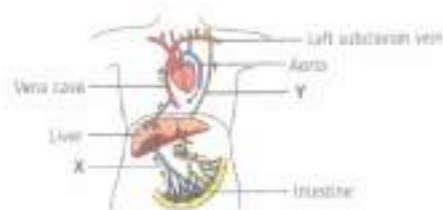
- a) A-Parotid gland, B-Liver, C-Pancreas, D-Caecum, E-Vermiform appendix
 b) A-Parotid gland, B-Pancreas, C-Liver, D-Caecum, E-Vermiform appendix
 c) A-Parotid gland, B-Caecum, C-Pancreas, D-Liver, E-Vermiform appendix
 d) A-Parotid gland, B-Liver, C-Caecum, D-Pancreas, E-Vermiform appendix

106. The diagram given below represents a section of small intestinal mucosa. Identify A, B and C.



- a) A-Villi, B-Lacteal, C-Capillaries b) A-Lacteal, B-Villi, C-Capillaries
 c) A-Villi, B-Lacteal, C-Crypts d) A-Crypts, B-Lacteal, C-Capillaries

107. Observe the given figure having arrows to illustrate the movement of absorbed food in the body. Select the correct option regarding it.



a)

Sugars		Amino acids		Fat/fatty acids/glycerol	
X	Y	X	Y	X	Y
✓	X	X	X	✓	✓

b)

Sugars		Amino acids		Fat/fatty/glycerol	
X	Y	X	Y	X	Y
✓	X	✓	X	X	✓

c)

Sugars		Amino acids		fat/fatty/glycerol	
X	Y	X	Y	X	Y
X	✓	X	✓	X	✓

d)

Sugars		Amino acids		fat/fatty/glycerol	
X	Y	X	Y	X	Y
✓	✓	X	X	✓	✓

108. Which of the following is correct regarding jaundice?

- a) Skin turns yellow b) Eyesturn yellow c) Liver gets affected d) All of these

109. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Glucose, Na⁺ and amino acids are absorbed actively.

Reason: Na⁺, glucose and amino acids move against the concentration gradient and hence require energy

- a) If both assertion and reason are false.
 b) If both assertion and reason are true and reason is the correct explanation of assertion.
 c) If both assertion and reason are true but reason is not the correct explanation of assertion
 d) If assertion is true but reason is false.

110. Which one is correctly matched?

- a) Vitamin E - Tocopherol b) Vitamin D-Riboflavin c) Vitamin B - Calciferol
 d) VitaminA-Thiamine

111. Consider the following statements each with one or two blanks

(i) Trypsinogen is activated to trypsin by ____ (1) ____.

(ii) Fatty acids and glycerol are absorbed into ____ (2) ____ but glucose and amino acids are absorbed into ill.

Which one of the following options, give the correct fill ups for the respective blanks (1) to (3) in the statements?

- a) (1) - cholecystokinin, (2) - blood vessels, (3) - lacteals
 b) (2) - lacteals, (3) - blood capillaries c) (1) - enterokinase, (2) - blood capillaries
 d) (1) - chymotrypsinogen, (3) - lacteals

112. During absorption of carbohydrates in the blood the most rapidly transported monosaccharide is

- a) glucose b) galactose c) fructose d) sucrose

113. Which one of the following correctly represents the normal adult human dental formula?

- a) 3/3,1/1,3/2,1/1 b) 2/2,1/1,3/2,3/3 c) 2/2,1/1,2/2,3/3 d) 3/3,1/1,3/3,3/3

114. Hydrolytic enzymes which act on low pH are called as ____

- a) proteases b) a-amylases c) hydrolases d) peroxidases

115. The lining of intestinal wall from outside to inside is made up of

- a) circular muscles → longitudinal muscles → mucosa → submucosa
 b) longitudinal muscles → circular muscles → submucosa → mucosa

- c) mucosa → submucosa → circular muscles → longitudinal muscles
d) submucosa → longitudinal muscles → circular muscles → mucosa

116. Where is protein digestion accomplished?

- a) Stomach b) Ileum c) Rectum d) Duodenum

117. Which cells of 'Crypts of Leiberkuhn' secrete antibacterial lysozyme?

- a) Argentaffin cells b) Paneth cells c) Zymogen cells d) Kupffer cells

118. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Goblet cells	(i) Antibacterial agent
B. Lysozyme	(ii) Mucus
C. Saliva	(iii) HCl
D. Oxyntic cells	(iv) Sublingual gland

- a) A-(iii), B-(i), C-(iv), D-(ii) b) A-(i), B-(iii), C-(iv), D-(ii) c) A-(ii), B-(iii), C-(i), D-(iv)
d) A-(ii), B-(i), C(iv), D-(iii)

119. Duct leading from parotid gland and opening into vestibule is _____

- a) Haversian duct b) Stenson's duct c) Wolffran duct d) Infra-orbital duct

120. Which one of the following is a fat-soluble vitamin and its related deficiency disease?

- a) Retinol - Xerophthalmia b) Cobalamine - Beriberi c) Calciferol - Pellagra
d) Ascorbic acid - Scurvy

121. Which one of the following is a protein deficiency disease?

- a) Eczema b) Cirrhosis c) Kwashiorkor d) Night blindness

122. Angiotensinogen is a protein produced and secreted by _____

- a) endothelial cells (lining the blood vessels) b) liver cells c) juxtaglomerular (JG) cells
d) macula densa cells

123. Read the following statements and select the correct option.

Statement 1 : Deglutition starts as a reflex and then continues by voluntary action.

Statement 2 : Oesophagus has smooth muscles in the beginning and striated muscles in the rest of its wall.

- a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect

124. In the given figure of human tooth, some parts are labelled as A, B, C and D. Identify these parts and match them with their description given below.

- (i) Contains dentine producing cells
(ii) 70% mineral matter, mainly calcium

- (iii) Hardest material in the body
(iv) Connects root to the jawbone



- a) (i) (ii) (iii) (iv) b) (ii) (iii) (iv) (i) c) (iii) (ii) (iv) (i) d) (ii) (iii) (i) (iv)

125. A child took sugarcane and sucked its juice. Regarding this which of the following match is correct?

a)

Substrate	Enzyme	Site of secretion of enzyme	Products formed
Proteins	Pepsin	Duodenum	Polypeptides

b)

Substrate	Enzyme	Site of secretion of enzyme	Products formed
Starch	Amylase	Salivary glands	Glucose

c)

Substrate	Enzyme	Site of secretion of enzyme	Products formed
Lipids	Lipase	Pancreas	Fat globules

d)

Substrate	Enzyme	Site of secretion of enzyme	Products formed
Sucrose	Invertase	Duodenum	Glucose +fructose

126. The epithelial cells lining the stomach of vertebrates are protected from damage by HCl because

- a) HCl is too dilute b) the epithelial cells are resistant to the action of HCl
c) HCl is neutralised in the stomach
d) the epithelial cells are covered by a mucus secretion

127. Glisson's capsule is the characteristic feature of

- a) mammals b) birds c) reptiles d) arthropods

128. Digestion of which component of food will be affected if the pH of stomach is made 7?

- a) Fat b) Protein c) Sucrose d) Vitamins

129. If you chew on a piece of bread long enough, it will begin to taste sweet because

- a) maltase is breaking down maltose b) lipases are forming fatty acids
c) amylase is breaking down starches to disaccharides
d) disaccharides are forming glucose

130. Pancreas produces _____

- a) three digestive enzymes and one hormone
b) three digestive enzymes and two hormones c) two digestive enzymes and one hormone
d) three digestive enzymes and no hormone

131. Which enzyme initiates protein digestion?
a) Carboxypeptidase b) Pepsin c) Trypsin d) Aminopeptidase
132. Choose the wrong enzymatic reaction.
a) $\text{Sucrose} \xrightarrow{\text{Invertase}} \text{Glucose} + \text{Fructose}$ b) $\text{Lactose} \xrightarrow{\text{Lactase}} \text{Glucose} + \text{Fructose}$
c) $\text{Pepsinogen} \xrightarrow{\text{HCl}} \text{Pepsin}$ d) $\text{Maltose} \xrightarrow{\text{Maltase}} \text{Glucose} + \text{Glucose}$
133. If pH of stomach is 1.6, then which enzyme will digest protein?
a) Amylase b) Trypsin c) Erypsin d) Pepsin
134. A gland not associated with the alimentary canal is
a) pancreas b) adrenal c) liver d) salivary glands.
135. Which of the following statements is/are incorrect?
(i) Absorption of simple sugar, alcohol, some water and medicines takes place in stomach.
(ii) Maximum water absorption occurs in large intestine.
(iii) Small intestine is the major site of digestion and absorption of food.
(iv) Fatty acid and glycerol are absorbed by lacteals.
(v) Nothing is absorbed in mouth and large intestine
a) (i), (iv) and (v) b) (v) only c) (iv) only d) (ii) and (iii)
136. Read the following four statements (i) to (iv) with certain mistakes in two of them.
(i) Fructose is generally absorbed by simple diffusion.
(ii) The digestive wastes, solidified into coherent faeces in the rectum initiate an endocrinal action causing an urge or desire for its removal.
(iii) The food mixes thoroughly with the acidic gastric juice of the stomach by the churning movements of its muscular wall and is called the chyme.
(iv) The secretions of the brush border cells of the mucosa along with the secretions of the goblet cells constitute the succus entericus.
Which of the above two statements have mistakes
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (i) and (iii)
137. Dental formula in human beings is
a) $\frac{3223}{3223}$ b) $\frac{2123}{2123}$ c) $\frac{1232}{1232}$ d) $\frac{2233}{2233}$
138. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Water and electrolytes are almost fully absorbed in the large intestine.
Reason: In large intestine, haustral contractions (slow segmenting movements) roll the forming faeces over and over, causing absorption of water and electrolytes.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
139. If for some reason our goblet cells are non functional, this will adversely affect _____.
a) production of somatostatin b) secretion of sebum from the sebaceous glands
c) maturation of sperms d) smooth movement of food down the intestine
140. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Van Kupffer cells	(i) Islets of Langerhans
B. cells	(ii) Liver sinusoids
C. Oxyntic cells	(iii) Thyroid gland
D. Crypts of Lieberkuhn	(iv) Stomach
	(v) Small intestine

- a) A-(iv), B-(v), C-(i), D-(ii) b) A-(iii), B-(i), C-(iv), D-(ii) c) A-(iv), B-(v), C-(iii), D-(i)
d) A-(ii), B-(i), C-(iv), D-(v)

141. The primary dentition in human differs from permanent dentition in not having one of the following type of teeth_____

- a) Premolars b) Molars c) Incisors d) Canine

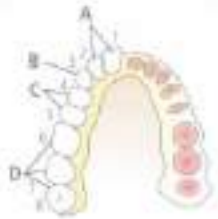
142. Conversion of milk to curd improves its nutritional value by increasing the amount of _____ .

- a) vitamin-B₁₂ b) vitamin - A c) vitamin - D d) vitamin - E

143. To which of the following family do folic acid and pantothenic acid belong?

- a) Vitamin - C b) Vitamin - K c) Vitamin - A d) Vitamin - B complex

144. The given figure shows the arrangement of different types of teeth in the jaw on one side. Identify A, B, C and D



a)

A	B	C	D
Incisors	Canine	Premolars	Molars

b)

A	B	C	D
Molars	Premolar	Canines	Incisors

c)

A	B	C	D
Premolars	Molar	Incisors	Canines

d)

A	B	C	D
Incisors	Canine	Molars	Premolars

145. In vertebrates lacteals are found in_____

- a) ileum b) ischium c) oesophagus d) ear

146. The pH of succus entericus is

- a) 6.6 b) 5.6 c) 2.0 d) 7.8

147. The contraction of gall bladder is due to_____

- a) gastrin b) secretin c) cholecystokinin d) enterogasterone

148. Which of the following statements is incorrect?

- a) Faecal accumulation in the rectum initiates a neural reflex causing an urge for its removal.
b) Irregular bowel movements cause constipation
c) In diarrhoea absorption of food is increased d) All of these

149. Kwashiorkor occurs due to_____

- a) deficiency of proteins and calories b) protein deficiency c) deficiency of calcium
d) deficiency of fats
150. In humans one of the constituents of the pancreatic juice which is poured into the duodenum is
a) trypsinogen b) chymotrypsin c) trypsin d) enterokinase.
151. During prolonged fasting, in what sequence are the following organic compounds used up by the body?
a) First proteins, next lipids and lastly carbohydrates
b) First carbohydrates, next fats and lastly proteins
c) First fats, next carbohydrates and lastly proteins
d) First carbohydrates, next proteins and lastly lipids
152. Which of the following processes is helped by bile salts?
- a) $Nucleic\ acid \xrightarrow{Nuclease} Nucleotides \xrightarrow{Nucleotidase} Nucleosides \xrightarrow{Nucleosidase} Sugars + bases$
- b) $Sucrose \xrightarrow{Sucrase} Glucose + Fructose$ c) $Fats \xrightarrow{Lipase} Diglycerides \xrightarrow{Lipase} Monoglycerides$
- d) $Proteins, peptones, proteoses \xrightarrow[Carboxypeptidase]{Trypsin/Chymotrypsin} Dipeptides$
153. Which of the following is incorrect regarding the given digestion and absorption of protein?
- (a) The breakdown of proteins to peptides is catalyzed by pepsin in the stomach and by the pancreatic enzymes trypsin and chymotrypsin in the small intestine.
- (b) Peptides are broken down into amino acids by pancreatic carboxypeptidase and intestinal aminopeptidase.
- (c) Small peptides consisting of two or three amino acids can diffuse through epithelial cell and broken down into carbon dioxide and ammonia which are released into the blood.
- (d) None of these
- a)
The breakdown of proteins to peptides is catalyzed by pepsin in the stomach and by the pancreatic enzymes trypsin and chymotrypsin in the small intestine.
- b)
Peptides are broken down into amino acids by pancreatic carboxypeptidase and intestinal aminopeptidase.
- c)
Small peptides consisting of two or three amino acids can diffuse through epithelial cell and broken down into carbon dioxide and ammonia which are released into the blood
- d) None of these
154. Stool of a person is whitish grey coloured due to malfunction of which of the following organ?
a) Pancreas b) Spleen c) Kidney d) Liver
155. Fill up the blanks in the following paragraph by selecting the correct option.
Small amounts of monosaccharides like glucose, amino acids and some of electrolytes like chloride ions are absorbed by ____ (i) _____. However, some of the substances like fructose and some amino acids are absorbed by the mechanism called the ____ (ii) _____. Various nutrients like amino acids and electrolytes like Na^+ are absorbed into the blood by ____ (iii) _____.

a)

(i)	(ii)	(iii)
facilitated transport	active transport	simple diffusion

b)

(i)	(ii)	(iii)
simple diffusion	facilitated transport	active transport

c)

(i)	(ii)	(iii)
active transport	facilitated transport	simple diffusion

d)

(i)	(ii)	(iii)
simple diffusion	active transport	facilitated transport

156. Pepsin acts in

- a) basic medium b) acidic medium c) neutral medium d) all types of medium

157. Which of the following terms describe human dentition?

- a) Pleurodont, Monophyodont, Homodont b) Pleurodont, Monophyodont, Homodont
c) Thecodont, Diphyodont, Homodont d) Pleurodont, Diphyodont, Heterodont

158. Which one of the following enzymes carries out the initial step in the digestion of milk in humans?

- a) Pepsin b) Rennin c) Lipase d) Trypsin

159. Which part of the mammalian alimentary canal does not secrete any enzyme?

- a) Mouth b) Oesophagus c) Stomach d) Duodenum

160. Rennin acts on _____.

- a) milk changing casein into calcium paracaseinate at 7.2 - 8.2 pH b) protein in stomach
c) fat in intestine d) milk changing casein into calcium paracaseinate at 1- 3 pH

161. The enzyme that is not present in succus entericus is:

- a) Maltase b) Nucleases c) Nucleosidase d) Lipase

162. Match column I with column II and select the correct option from the given codes

Column I (Sphincter)	Column II (Location)
A. Peptic cells	(i) Mucus
B. Oxyntic cells	(ii) Alkaline fluid
C. Goblet cells	(iii) Pro-enzymes
	(iv) HCl

- a) A-(ii), B-(i), C-(iv) b) A-(iv), B-(iii), C-(ii) c) A-(iv), B-(i), C-(ii) d) A-(iii), B-(iv), C-(i)

163. Read the following statements and select the correct option.

Statement 1 : The worm-like structure attached to the caecum at the beginning of the large intestine is known as vermiform appendix.

Statement 2 : Vermiform appendix has no apparent digestive function.

- a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect.

- c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
164. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** Pancreas is a heterocrine gland.
Reason: Endocrine part secretes insulin and glucagon and exocrine part secretes an acidic pancreatic juice containing enzymes.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
165. Select what is not true of intestinal villi among followings.
- a) They possess microvilli. b) They increase the surface area
c) They are supplied with capillaries and the lacteal vessels.
d) They only participate in digestion of fats.
166. The initial step in the digestion of milk in humans is carried out by_____
- a) Lipase b) Trypsin c) Rennin d) Pepsin
167. Which of the following statements is incorrect about pancreas?
- a) It is a compound gland as it has both exocrine and endocrine part.
b) Exocrine part secretes alkaline pancreatic juice having enzymes
c) Endocrine part secretes hormones like insulin and glucagon
d) It is surrounded by Glisson's capsule
168. In frog, the surface of attachment of tongue is____
- a) sphenoid b) palatine c) pterygoid d) hyoid apparatus
169. Which of the following statements is correct?
- a) Goblet cells secrete pepsinogen b) Parietal cells secrete hydrochloric acid
c) Argentaffin cells secrete mucus. d) Chief cells secrete gastrin
170. Brunner's glands occur in_____
- a) sub-mucosa of duodenum b) sub-mucosa of stomach c) mucosa of oesophagus
d) mucosa of ileum
171. One of the following is not a common disorder associated with digestive system.
- a) Tetanus b) Diarrhoea c) Jaundice d) Dysentery
172. Where do certain symbiotic microorganisms normally occur in human body?
- a) Caecum b) Oral lining and tongue surface c) Vermiform appendix and rectum
d) Duodenum
173. What will happen if the secretion of parietal cells of gastric glands is blocked with an inhibitor?
- a) Gastric juice will be deficient in chymosin b) Gastric juice will be deficient in pepsinogen
c)
In the absence of HCl secretion, inactive pepsinogen is not converted into the active enzyme pepsin

d)

Enterokinase will not be released from the duodenal mucosa and so trypsinogen is not converted to trypsin

174. Which of the following gastric cells indirectly help in erythropoiesis?

- a) Goblet cells b) Mucous cells c) Chief cell d) Parietal cells

175. The layer of cells that secrete enamel of tooth is _____

- a) dentoblast b) ameloblast c) osteoblast d) odontoblast

176. Which one of the following vitamin can be synthesised by bacteria inside the gut?

- a) B₁ b) C c) D d) K

177. Wharton's duct is associated with _____

- a) sub-lingual salivary duct b) parotid salivary gland c) sub-maxillary salivary gland
d) Brunner's glands

178. Match column I with column II and select the correct option from the given codes.

Column I (Types of cells)	Column II (Secretions)
A. Beta cells	(i) Lysozym
B. Mast cells	(ii) Mucus
C. Paneth cells	(iii) Histamine
D. Acinar cells	(iv) Insulin
	(v) Pancreatic enzymes

- a) A-(iv), B-(ii), C-(i), D-(v) b) A-(v), B-(ii), C-(iii), D-(iv) c) A-(iv), B-(iii), C-(i), D-(v)
d) A-(ii), B-(iii), C-(i), D-(v)

179. One of the factors required for the maturation of erythrocytes is _____

- a) vitamin - D b) vitamin - A c) vitamin - B₁₂ d) vitamin - C

180. Which of the following is the primary absorptive process in the large intestine?

- a) Active transport of Na⁺ from the lumen to the blood
b) Absorption of amino acids and fructose
c) Active transport of potassium from the lumen to the blood
d) Active absorption of HCO₃⁻ into the blood

181. Which of the following pair is characterised by swollen lips, thick pigmented skin of hands and legs and irritability?

- a) Thiamine - Beri-beri b) Protein - Kwashiorkor c) Nicotinamide - Pellagra
d) Iodine - Goitre

182. Emulsification of fat will not occur in the absence of _____

- a) lipase b) bile Pigments c) bile salts d) pancreatic juice

183. Duodenum has characteristic Brunner's gland which secrete two hormones called _____

- a) Kinase, estrogen b) Secretin, cholecystokinin c) Prolactin, parathormone
d) Estradiol, progesterone

184. If we take food rich in lime juice, then

- a) action of ptyalin on starch is enhanced b) action of ptyalin on starch is reduced
c) action of ptyalin on starch is unaffected d) action of ptyalin on starch stops

185. Select the correct match of the digested products in humans given in column I with their absorption site and mechanism in column II

a)

Column I	Column II
Glycine, glucose	Small intestine, active absorption

b)

Column I	Column II
Fructose, Na	Small intestine, passive absorption

c)

Column I	Column II
Glycerol, fatty acids	Duodenum, move as chylomicrons

d)

Column I	Column II
Cholesterol, maltose	Large intestine, active absorption

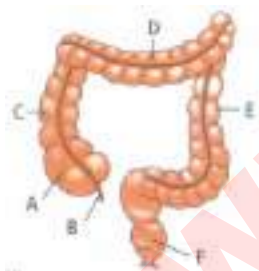
186. The hepatic portal vein drains blood to liver from_____

a) Stomach b) Kidneys c) Intestine d) Heart

187. The vitamin-C or ascorbic acid prevents_____

a) rickets b) pellagra c) scurvy d) antibody synthesis

188. The diagram of large intestine of man is given here Identify the parts labelled as A, B, C, D, E and F



a)

A - Caecum, B - Vermiform appendix, C - Ascending colon, D - Transverse colon, E - Descending colon, F - Sigmoid colon

b)

A - Sigmoid colon, B - Vermiform appendix, C - Descending colon, D - Transverse colon, E - Ascending colon, F - Caecum

c)

A - Sigmoid colon, B - Vermiform appendix, C - Ascending colon, D - Transverse colon, E - Descending colon, F - Caecum

d)

A - Caecum, B - Vermiform appendix, C - Sigmoid colon, D - Ascending colon, E - Transverse colon, F - Descending colon

189. Fill in the blanks with appropriate enzymes that are required for the following changes.

(i) Trypsinogen $\xrightarrow{?}$ Trypsin

(ii) Caesin $\xrightarrow{?}$ Paracasein + Whey proteins

(iii) RNA $\xrightarrow{?}$ Ribonucleotides

(iv) Triglycerides $\xrightarrow{?}$ Fatty acids + Glycerol

a)

(i)	(ii)	(iii)	(iv)
Enterocrinin	Pepsin	Trypsin	Lactase

b)

(i)	(ii)	(iii)	(iv)
Rennin	Enterokinase	Deoxyribo-nuclease	Lipase

c)

(i)	(ii)	(iii)	(iv)
Carboxy-peptidase	Pepsin	Chymotrypsin	Dextrinas

d)

(i)	(ii)	(iii)	(iv)
Enterokinase	Rennin	Ribonuclease	Lipase

190. Which of the following are the causes of indigestion?

- a) Anxiety b) Food poisoning c) Over eating d) All of these

191. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Mucous neck cells	(i) HCl, Intrinsic factor
B. Peptic/Chief cells	(ii) Mucus
C. Parietal/Oxyntic cells	(iii) Pepsinogen

- a) A-(ii), B-(iii), C-(iv) b) A-(iii), B-(ii), C-(i) c) A-(i), B-(ii), C-(iii) d) A-(ii), B-(i), C-(iii)

192. Identify the correct statement with reference to human digestive system_____

- a) Ileum is a highly coiled part b) Vermiform appendix arises from duodenum
c) Ileum opens into small intestine d) Serosa is the innermost layer of the alimentary canal.

193. Which of the following is mismatched?

- a) Vitamin-K - Beri-beri b) Vitamin-D - Rickets c) Vitamin-C - Scurvy
d) Vitamin-A - Xerophthalmia

194. Lactose is composed of_____

- a) glucose + fructose b) glucose + glucose c) glucose + galactose
d) fructose + galactose

195. Which one of the following is the correct matching of the site of action on the given substrate, the enzyme acting upon it and the end product?

- a) Duodenum: Triglycerides Monoglycerides
b) Small intestine: Starch Disaccharide (Maltose) c) Small intestine; Proteins Amino acids
d) Stomach: Fats Micelles

196. A bolus is

- a) a mass of crushed food moistened with saliva
b) the semisolid material resulting from partial digestion in the stomach
c) the milky emulsified fat absorbed from small intestine
d) indigestible materials that help in movement and absorption of food

197. Release of pancreatic juice is stimulated by_____

- a) enterokinase b) cholecystokinin c) trypsinogen d) secretin

198. Which one of the following types of cells and their secretion is correctly matched?
- a) Oxyntic cells - a secretion with pH between 2.0 and 3.0
 - b) Alpha cells of islets of Langerhans - secretion that decreases blood sugar level
 - c) Kupffer cells - a digestive enzyme that hydrolyses nucleic acids
 - d) None of these
199. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
- Assertion:** Bile helps in emulsification of fat.
- Reason:** Bile salts help in incorporating fatty acids and glycerol into water soluble droplets called chylomicrons.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion
 - c) If assertion is true but reason is false.
 - d) If both assertion and reason are false.
200. If for some reason the parietal cells of the gut epithelium become partially non-functional, what is likely to happen?
- a) The pancreatic enzymes and specially the trypsin and lipase will not work efficiently
 - b) The pH of stomach will fall abruptly.
 - c) Steapsin will be more effective.
 - d) Proteins will not be adequately hydrolysed by pepsin into proteoses and peptones.



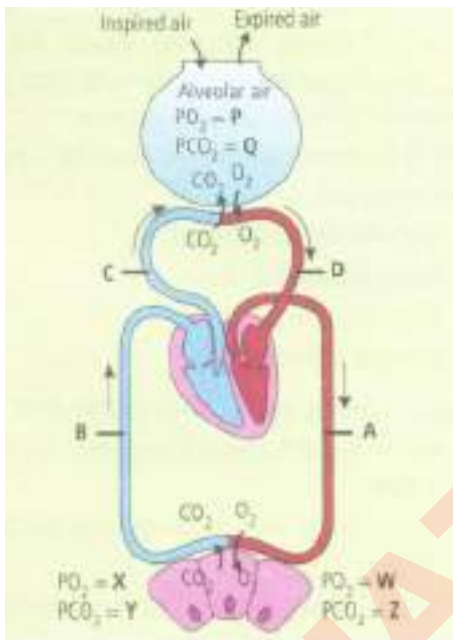
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Time : 1 Mins

BREATHING AND EXCHANGE OF GASES 1

Marks : 680

1. Which of the labelled blood vessels A, B, C or D carries oxygenated blood?



- a) A and B b) B and C c) A and D d) B and D
2. Air is breathed through _____.
- a) trachea - lungs - larynx - pharynx - alveoli
b) nose - larynx - pharynx - bronchus - alveoli - bronchioles
c) nostrils - pharynx - larynx - trachea - bronchi - bronchioles - alveoli d) nose - mouth - lungs
3. Rate of breathing is controlled mainly by:
- a) CO_2 level in blood b) pH in blood c) O_2 level in blood d) O_2 level and pH in blood.
4. Complete the following sentence by selecting the correct option.
The breathing rhythm is generated in the ____ (i) ____ and is influenced by variation in levels of ____ (ii) ____ in the blood.

a)

(i)	(ii)
medulla	CO_2

b)

(i)	(ii)
medulla	O_2

c)

(i)	(ii)
frontal lobe	CO_2 and O_2

d)

(i)	(ii)
frontal lobe	CO_2

5. Match the following and mark the correct options.

Animal	Respiratory Organ
A. Earthworm	(i) Moist cuticle
B. Aquatic arthropods	(ii) Gills
C. Fishes	(iii) Lungs
D. Birds/Reptiles	(iv) Trachea

- a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(i), B-(iv), C-(ii), D-(iii) c) A-(i), B-(iii), C-(ii), D-(iv)
d) A-(i), B-(ii), C-(iv), D-(iii)

6. People living at sea level have around 5 million RBC per cubic millimetre of their blood whereas those living at an altitude of 5400 metres have around 8 million. This is because at high altitude
- people eat more nutritive food, therefore more RBCs are formed
 - people get pollution-free air to breathe and more oxygen is available
 - atmospheric O_2 level is less and hence more RBCs are needed to absorb the required amount of O_2 to survive
 - there is more UV radiation which enhances RBC production.
7. The toxic effect of carbon monoxide is due to its greater affinity for haemoglobin as compared to oxygen approximately by
- 200 times
 - 1000 times
 - 2 times
 - 20 times
8. **Assertion:** Tracheae, primary, secondary and tertiary bronchi are supported by incomplete cartilaginous rings.
- Reason:** These rings of cartilage make the wall noncollapsible.
- If both assertion and reason are true and reason is the correct explanation of assertion.
 - If both assertion and reason are true but reason is not the correct explanation of assertion.
 - If assertion is true but reason is false.
 - If both assertion and reason are false
9. A person breathing normally at rest, takes in and expels approximately half a litre of air during each respiratory cycle. This is called
- inspiratory reserve volume
 - tidal volume
 - expiratory reserve volume
 - vital capacity
10. Lungs are enclosed in
- perichondrium
 - pericardium
 - pleural membrane
 - peritoneum.
11. In alveoli of the lungs, the air at the site of gas exchange, is separated from the blood by _____.
- alveolar epithelium only
 - alveolar epithelium and capillary endothelium
 - alveolar epithelium, capillary endothelium and tunica adventitia
 - alveolar epithelium, capillary endothelium, a thin layer of tunica media and tunica adventitia
12. Chemosensitive area of respiratory centre in medulla is affected by
- less CO_2 and H^+ ions
 - less O_2 and H^+ ions
 - excess CO_2 and H^+ ions
 - excess O_2 and H^+ ions.
13. The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in _____
- Fallopian tubes and Pancreatic duct
 - Eustachian tube and Salivary duct
 - Bronchioles and Fallopian tubes
 - Bile duct and Bronchioles
14. In the given mechanism, diaphragm, sternum and intercostal muscles work together to the thoracic volume and thereby pulmonary volume. This leads to _____ in intra-pulmonary pressure to slightly _____ the atmospheric pressure, causing expiration. Select the correct sequence of

words to complete the above paragraph.



- a) decrease, decrease, below b) increase, decrease, above c) decrease, increase, above
d) increase, increase, below

15. Which one of the following is the incorrect statement for respiration in humans?

- a) Cigarette smoking may lead to inflammation of bronchi.
b) Neural signals from pneumotaxic centre in pons region of brain can increase the respiratory rate.
c) Workers in grinding and stone-breaking industries may suffer from lung fibrosis.
d) None of these

16. Match the items given in Column I with those in Column II and select the correct option given below

Column I	Column II
1. Tidal volume	i. 2500- 3000 mL
2. Inspiratory	ii. 1100 - 1200 mL reserve volume
3. Expiratory	iii. 500 - 550 reserve volume
4. Residual	iv. 1000 -1100 mL volume

- a) (i),(iv),(ii),(iii) b) (iii),(i),(iv),(ii) c) (iii),(ii),(i),(iv) d) (iv),(iii),(ii),(i)

17. Given below are few respiratory disorders. Identify occupational respiratory disorders among these.

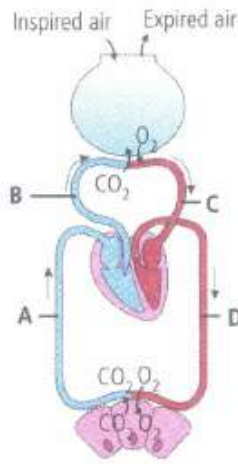
- (j) Coryza
(ii) SARS
(iii) Silicosis
(iv) Asbestosis
(v) Emphysema

- a) (i) and (ii) b) (i) and (v) c) (iii) and (iv) d) (i), (ii) and (v)

18. One haemoglobin carries how many molecules of O_2 ?

- a) 4 b) 2 c) 6 d) 8

19. The given figure shows diagrammatic representation of exchange of gases at the alveolus and the body tissues with blood and transport of oxygen and carbon dioxide. Identify the blood vessels A to D



a)

A	B	C	D
Systemic vein	Pulmonary artery	Pulmonary vein	Systemic artery

b)

A	B	C	D
Systemic artery	Pulmonary artery	Pulmonary vein	Systemic vein

c)

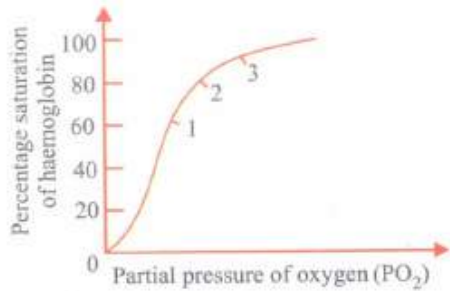
A	B	C	D
Pulmonary artery	Systemic vein	Pulmonary vein	Systemic artery

d)

A	B	C	D
Systemic vein	Pulmonary vein	Pulmonary artery	Systemic artery

20. In breathing movements, air volume can be estimated by
 a) stethoscope b) hygrometer c) sphygmomanometer d) spirometer
21. Inspiration occurs when there is a negative pressure in the lungs with respect to atmospheric pressure. This negative pressure is achieved when
 a) intrapulmonary pressure is less than the atmospheric pressure
 b) intrapulmonary pressure is greater than the atmospheric pressure
 c) intrapulmonary pressure is equal to the atmospheric pressure
 d) intrapleural pressure becomes more than the intraalveolar pressure.
22. **Assertion:** Asthma is a difficulty in breathing causing wheezing.
Reason: Asthma occurs due to inflammation of bronchi and bronchioles.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.

23. The given graph shows an oxygen dissociation curve for haemoglobin.



Where in the body will haemoglobin be saturated at the percentages shown at points 1, 2 and 3 on the graph?

a)

left ventricle	Pulmonary vein	Vena cava
1	2	3

b)

left ventricle	Pulmonary vein	Vena cava
2	1	3

c)

left ventricle	Pulmonary vein	Vena cava
2	3	1

d)

left ventricle	Pulmonary vein	Vena cava
3	2	1

24. **Assertion:** A rise in PCO_2 , H^+ ions and temperature shifts the HbO_2 dissociation curve to right.

Reason: A rise in PCO_2 or fall in pH decreases oxygen affinity for haemoglobin.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

25. During CO_2 transport, HCO_3^- diffuses from erythrocytes to plasma and in turn upsets the ionic balance momentarily. In order to keep the ionic balance, an equal number of Cl^- pass into the erythrocytes from plasma. The process is known as:

a) Hamburger phenomenon b) bicarbonate shift c) carbonation d) Bohr's effect.

26. CO_2 dissociates from carbamino haemoglobin when

a) PCO_2 is high and PO_2 is low b) PO_2 is high and PCO_2 is low c) PCO_2 and PO_2 are equal
d) none of the above.

27. From the following relationships between respiratory volumes and capacities, mark the correct option.

(i) Inspiratory Capacity (IC) = Tidal Volume + Residual Volume

(ii) Vital Capacity (VC) = Tidal Volume (TV) + Inspiratory Reserve Volume (IRV) + Expiratory Reserve Volume (ERV)

(iii) Residual Volume (RV) = Vital Capacity (VC) - Inspiratory Reserve Volume (IRV)

(iv) Tidal Volume (TV) = Inspiratory Capacity (IC) - Inspiratory Reserve Volume (IRV)

a) (i) Incorrect, (ii) Incorrect, (iii) Incorrect, (iv) Correct

b) (i) Incorrect, (ii) Correct, (iii) Incorrect, (iv) Correct

c) (i) Correct, (ii) Correct, (iii) Incorrect, (iv) Correct

d) (i) Correct, (ii) Incorrect, (iii) Correct, (iv) Incorrect

28. The inspiratory reserve volume + tidal volume + expiratory reserve volume is the same as:

a) inspiratory capacity + expiratory reserve volume

b) total lung capacity - functional residual capacity

c) inspiratory capacity + functional residual capacity d) inspiratory capacity + residual volume.

29. **Assertion:** Chloride shift is exchange of Cl^- of plasma and HCO_3^- of RBCs.

Reason: Chloride shift maintains an acid base balance between the RBCs and plasma.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false

30. The given figure illustrates the changes in lung volume during the process of breathing.



The change from II to III indicates the

- a) movement of diaphragm away from the lungs
 - b) expansion of the thoracic cavity
 - c) movement of air out of the lungs
 - d) expansion of ribs.
31. After taking a long deep breath we do not respire for some seconds due to
- a) more CO_2 in blood
 - b) more O_2 in blood
 - c) less CO_2 in blood
 - d) less O_2 in blood
32. Respiration in insects is called direct because:
- a) the cells exchange O_2/CO_2 directly with the air in the tubes
 - b) the tissues exchange O_2/CO_2 directly with coelomic fluid
 - c) the tissues exchange O_2/CO_2 directly with the air outside through body surface
 - d)
- tracheal tubes exchange O_2/CO_2 directly with the haemocoel which then exchange with tissues.
33. **Assertion:** The role of oxygen in the regulation of respiratory rhythm is quite insignificant.
- Reason:** Increased PCO_2 and H^+ concentration inputs from chemoreceptors can activate respiratory rhythm centre to make necessary adjustments.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false
 - d) If both assertion and reason are false.
34. The enzyme that increases the reaction rate between CO_2 and H_2O in red blood cells is
- a) carbonic anhydrase
 - b) adenylate cyclase
 - c) carbonic synthetase
 - d) alkaline phosphatase.
35. The majority of carbon dioxide produced by our body cells is transported to the lungs_____
- a) as bicarbonates
 - b) as carbonates
 - c) attached to hemoglobin
 - d) dissolved in the blood
36. After forceful inspiration, the amount of air that can be breathed out by maximum forced expiration is equal to
- a)
- Inspiratory Reserve Volume (IRV) + Expiratory Reserve Volume (ERV) + Tidal Volume (TV) + Residual Volume (RV)
- b) IRV + RV + ERV
 - c) IRV + TV + ERV
 - d) TV + RV + ERV.
37. Respiratory process is regulated by certain specialised centres in the brain. One of the following listed centres can reduce the inspiratory duration upon stimulation.
- a) Medullary inspiratory centre
 - b) Pneumotaxic centre
 - c) Apneustic centre
 - d) Chemosensitive centre

38. Consider the following four statements and select the correct option stating which ones are true (T) and which ones are false (F).

- (i) Expiration is normally brought about by the relaxation of inspiratory muscles.
- (ii) Oxyhaemoglobin can hold much less carbon dioxide in the form of carbaminohaemoglobin than what deoxyhaemoglobin can.
- (iii) A person can expel all the air from the lungs by a forceful expiration.
- (iv) A rise in PCO_2 increases the oxygen-affinity of haemoglobin.

a)	b)	c)	d)
(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)
F F T F	T T T F	F T T F	T T T F

39. In the tissues, high concentrations of carbon dioxide

- a) increases the affinity of haemoglobin to both oxygen and hydrogen
- b) increases the affinity of haemoglobin to oxygen but decreases its affinity to hydrogen
- c) decreases the affinity of haemoglobin to oxygen but increases its affinity to hydrogen
- d) decreases the affinity of haemoglobin to both oxygen and hydrogen.

40. Complete the following sentences by selecting the correct option.

- (A) Inspiratory capacity (IC) = ___(i)___ + IRV
- (B) ___(ii)___ = TV + IRV + ERV
- (C) Functional residual capacity (FRC) = ERV + ___(iii)___.

a)

(i)	(ii)	(iii)
Vital capacity	Tidal volume	Residual volume

b)

(i)	(ii)	(iii)
Expiratory capacity	Residual volume	Inspiratory reserve volume

c)

(i)	(ii)	(iii)
Tidal volume	Vital capacity	Residual volume

d)

(i)	(ii)	(iii)
Tidal volume	Total lung capacity	Expiratory capacity

41. Which of the following statements about the mechanism of ventilation/breathing is incorrect?

- a) As the diaphragm relaxes, air is expelled from the respiratory system.
- b) During inspiration the lungs act as suction pump.
- c) Inspiration is a passive and expiration is an active process.
- d) For quiet breathing, external intercostal muscles and diaphragm play an important role

42. **Assertion:** If two men, expire the same volume of air after normal inspiration, they have the same expiratory capacity.

Reason: Expiratory capacity includes tidal volume and inspiratory reserve volume

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false

43. Among the following the partial pressure of oxygen is maximum in

- a) alveolar air b) arterial blood c) venous blood d) expired air

44. Carbon dioxide is transported from tissues to respiratory surface by only _____

- a) plasma and erythrocytes b) plasma c) erythrocytes d) erythrocytes and leucocytes

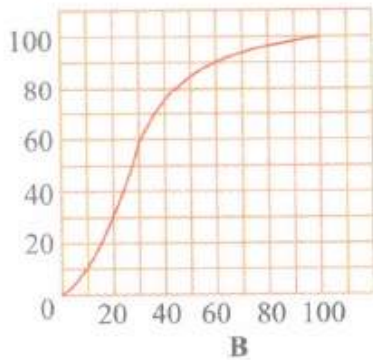
45. Lungs are made up of air-filled sacs. the alveoli. They do not collapse even after forceful expiration, because of _____
 a) inspiratory Reserve volume b) Tidal Volume c) Expiratory Reserve Volume
 d) Residual Volume
46. Lungs do not collapse between breathe and some air always remain in the lungs which can never be expelled because:
 a) There is a negative pressure in the lungs
 b) There is a negative intrapleural pressure pulling at the lung walls
 c) There is a positive intrapleural pressure
 d) Pressure in the lungs is higher than the atmospheric pressure
47. Which of the following options correctly represents the lung conditions in asthma and emphysema, respectively?
 a) Increased respiratory surface; Inflammation of bronchioles
 b) Increased number of bronchioles; Increased respiratory surface
 c) Inflammation of bronchioles; Decreased respiratory surface
 d) Decreased respiratory surface; Inflammation of bronchioles
48. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Carbamino-haemoglobin	(i) Inspiration
B. Diaphragm	(ii) Hamburger's phenomenon
C. Larynx	(iii) Diffusion of Cl^- into RBCs
D. Pons Varolii	(iv) Carbon dioxide
E. Chloride shift	(v) Cartilages
	(vi) Pneumotaxic centre
	(vii) Expiration

- a) A-(iv); B-(i), (vii); C-(v); D-(vi); E-(ii), (iii) b) A-(v); B-(i); C-(iv), (vii); D-(vi); E-(ii), (iii)
 c) A-(ii), (vi); B-(i); C-(iii); D-(v), (vii); E-(iv) d) A-(iii); B-(i); C-(ii),(v); D-(vi), (vii); E-(iv)
49. Which one of the following options correctly represents the lung conditions in asthma and emphysema, respectively?
 a) Increased respiratory surface; Inflammation of bronchioles
 b) Increased number of bronchioles; Increased respiratory surface
 c) Inflammation of bronchioles; Decreased respiratory surface
 d) Decreased respiratory surface; Inflammation of bronchioles
50. Which of the following equations is correct?
 a) $\text{CO}_2 \rightarrow \text{H}_2\text{O} \rightarrow \text{HCO}_3^- + \text{H}^+$ b) $\text{CO}_2 + \text{H}_2\text{O} \xrightleftharpoons[\text{anhydrase}]{\text{Carbanic}} \text{H}_2\text{CO}_3 \xrightleftharpoons[\text{anhydrase}]{\text{Carbonic}} \text{H}^+ + \text{HCO}_3^-$
 c) $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{CH}_4 + 2\text{O}_2$ d) $\text{CO}_2 + \text{H}_2\text{O} \rightleftharpoons \text{CO} + \text{H}_2\text{O}_2$
51. Following are few characters of a disorder in human body.
 (i) Inflammation of the mucous membrane of nasal passage
 (ii) Watery secretions by mucous glands
 (iii) Continuous sneezing
 (iv) Eyewatering
 (v) Rise in body temperature
 Identify the disorder from the choices given below.
 a) Diphtheria b) Rhinitis c) Bronchial carcinoma d) Emphysema

52. Visiting high mountains may cause altitude sickness in men living in plain areas. Prime cause of this is
- a) excess of CO_2 in blood b) decreased efficiency of haemoglobin
 - c) decreased partial pressure of oxygen d) decreased efficiency of red blood cells.
53. Which one of the following statements is incorrect?
- a) The principle of countercurrent flow facilitates efficient respiration in gills of fishes.
 - b) The residual air in lungs slightly decreases the efficiency of respiration in mammals.
 - c) The presence of non-respiratory air sacs, increases the efficiency of respiration in birds.
 - d) In insects, circulating body fluids serve to distribute oxygen to tissues.
54. What is the vital capacity of our lungs?
- a) Total lungs capacity minus residual volume b) Inspiratory reserve volume plus tidal volume
 - c) Total lungs capacity minus expiratory reserve volume
 - d) Inspiratory reserve volume plus expiratory reserve volume
55. The quantity 1500 mL in the respiratory volumes of a normal human adult refers to _____
- a) maximum air that can be breathed in and breathed out b) residual volume
 - c) expiratory reserve volume d) total lung capacity
56. Which of the following factors is not favourable for the formation of oxyhaemoglobin?
- a) High PO_2 b) Low temperature c) Less H^+ concentration d) High PCO_2
57. Which of the following options is incorrect about the larynx (sound box)?
- a) It is a bony box b) Glottis is the opening into the larynx.
 - c) During swallowing of food glottis is covered by epiglottis to prevent food entry into the larynx.
 - d) All of these
58. Reduction the pH of blood will:
- a) Reduce the blood supply to the brain b) Decrease the affinity of haemoglobin with oxygen
 - c) Release bicarbonate ions by the liver d) Reduce the rate of heartbeat
59. Select the correct events that occur during inspiration.
- (a) Contraction of diaphragm
 - (b) Contraction of external inter costal muscles
 - (c) Pulmonary volume decreases
 - (d) Intra pulmonary pressure increases
- a) (a), (b) and (d) b) only (d) c) (a) and (b) d) (c) and (d)
60. Read the given statements and select the correct option.
- Statement 1: Mammals can eat while breathing.
- Statement 2: Mammals have negative-pressure breathing
- a) Both statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
 - c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect

61. Which of the following is incorrect about the given graph?



- a) The curve is called oxygen dissociation curve.
 b) The part 'A' represents percentage saturation of haemoglobin with oxygen.
 c) The part 'B' represents partial pressure of carbon dioxide.
 d) This curve is highly useful in studying the effect of factors like PCO_2 , H^+ concentration, etc. on binding of CO_2 with haemoglobin.
62. **Assertion:** The lungs are situated in thoracic chamber which is anatomically an air-tight chamber.
Reason: Such an arrangement is essential to avoid any change in pulmonary volume.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false
63. The urge to inhale in humans results from:
 a) rising PCO_2 b) rising PO_2 c) falling PCO_2 d) falling PO_2 .
64. Besides RBC blood plasma also carries O_2 in solution. The percentage is
 a) 3-9% b) 1-2% c) 3-6% d) 2-3%.
65. Mark the incorrect statement in context to O_2 binding to Hb
 a) Higher pH b) Lower temperature c) Lower PCO_2 d) Higher PO_2
66. In humans, which of the following is not a step in respiration?
 a) Alveolar diffusion of O_2 and CO_2 b) Transport of gases by blood
 c) Diffusion of O_2 and CO_2 between blood and tissues
 d) Utilisation of CO_2 by cells for catabolic reactions
67. Which one of the following organs in the human body is most affected due to shortage of oxygen?
 a) Intestine b) Skin c) Kidney d) Brain
68. Human beings have a significant ability to maintain and moderate the respiratory rhythm to suit demands of the body. For it we have
 Respiratory rhythm centre in medulla - R
 Pneumotaxic centre in pons - PT
 Chemosensitive area in medulla - C1
 Peripheral chemoreceptors in aortic arch and carotid artery- C2
 Find out the correct path for regulation of respiration.
 a) $C_2 \rightarrow R \rightarrow PT \rightarrow C_1$ b) $PT \rightarrow \underset{\uparrow C_1}{R} \leftarrow C_2$ c) $C_1 \rightarrow \underset{\uparrow R}{PT} \rightarrow C_2$ d) $PT \rightarrow \underset{\uparrow R}{C_2} \leftarrow C_1$
69. In lungs, the air is separated from the venous blood through

- a) transitional epithelium + tunica externa of blood vessel
b) squamous epithelium + endothelium of blood vessel
c) squamous epithelium + tunica media of blood vessel d) none of these

70. Although much CO_2 is carried in blood, yet blood does not become acidic, because _____
a) it is absorbed by the leucocytes b) blood buffers play an important role in CO_2 transport
c) it combines with water to form H_2CO_3 which is neutralised by Na_2CO_3
d) it is continuously diffused through tissues and is not allowed to accumulate

71. Fill up the blanks in the following paragraph by selecting the correct option.

Human beings have a significant ability to maintain and moderate the respiratory rhythm to suit the demands of the body tissues. This is done by the neural system. A specialised centre present in the medulla region of the brain called ____ (i) ____ is primarily responsible for this regulation. Another centre present in the pons region of the brain called ____ (ii) ____ can moderate the functions of the respiratory rhythm centre. Neural signal from this centre can reduce the duration of ____ (iii) ____ and thereby alter the respiratory rate. A ____ (iv) ____ is situated adjacent to the rhythm centre which is highly sensitive to CO_2 and hydrogen ions.

a)

(i)	(ii)	(iii)	(iv)
Chemosensitive area	Respiratory rhythm centre	Expiration	Pneumotaxic centre

b)

(i)	(ii)	(iii)	(iv)
Respiratory rhythm centre	Pneumotaxic centre	Inspiration	Chemosensitive

c)

(i)	(ii)	(iii)	(iv)
Respiratory rhythm centre	Chemosensitive area	Expiration	Pneumotaxic centre

d)

(i)	(ii)	(iii)	(iv)
Pneumotaxic centre	Chemosensitive area	Inspiration	Respiratory rhythm centre

72. Emphysema is a condition resulting from

- a) cigarette smoking b) liquor consumption c) drug addiction
d) reduced oxygen carrying capacity of blood

73. Blood carries the CO_2 in three forms. The correct percentages of CO_2 in these forms are

a)

As carbamino haemoglobin in RBC	As bicarbonates	Dissolved form in plasma
(a) 20 - 25%	70%	7%

b)

As carbamino haemoglobin in RBC	As bicarbonates	Dissolved form in plasma
(b) 70%	20-25%	7%

c)

As carbamino haemoglobin in RBC	As bicarbonates	Dissolved form in plasma
(c) 20-25%	7%	70%

d)

As carbamino haemoglobin in RBC	As bicarbonates	Dissolved form in plasma
7%	20-25%	70%.

74. Which of the following is an occupational respiratory disorder?

- a) Botulism b) Silicosis c) Anthracis d) Emphysema

75. Consider the following statements each with two blanks.

- (i) Diaphragm contracts to help in ____ (1) ____ while the contraction of abdominal muscles helps in ____ (2) ____.
- (ii) Vital capacity of trained athletes is ____ (3) ____ than that of non-athletes while the vital capacity of non-smokers is ____ (4) ____ than that of smokers.
- (iii) Alveolar PO_2 is J5L than the venous PO_2 while arterial PO_2 is JQL than the alveolar PO_2 .
- Which of the following options gives the correct fill ups for the respective blanks numbered from (1) to (6) in the above statements?
- a) (1)-expiration, (2)-inspiration, (5)-higher, (6)-lower b) (3)-higher, (4)-lower, (5) lower, (6)-higher
- c) (1)-inspiration, (2)-forced expiration, (3)-higher, (4)-higher
- d) (1)-expiration, (2)-forced expiration, (5)-higher, (6)-lower

76. It is known that exposure to carbon monoxide is harmful to animals because

- a) it reduces CO_2 transport b) it reduces O_2 transport c) it increases CO_2 transport
- d) it increases O_2 transport.

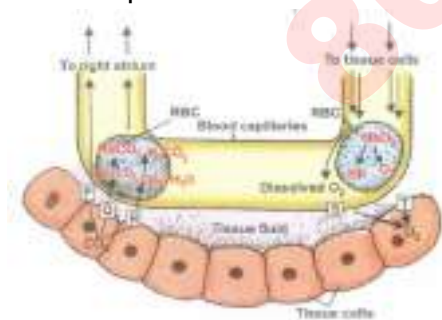
77. Listed below are four respiratory capacities (i-iv) and four jumbled respiratory volumes of a normal human adult.

Respiratory volumes and capacities	Volume of air
(i) Residual volume	2500 mL
(ii) Vital capacity	3500 mL
(iii) Inspiratory reserve volume	1200 mL
(iv) Inspiratory capacity	4500 mL

Which one of the following is the correct matching of two capacities and volumes?

- a) (ii) 2500 mL, (iii) 4500 mL b) (iii) 1200 mL, (iv) 2500 mL c) (iv) 3500 mL, (i) 1200 mL
- d) (i) 4500 mL, (ii) 3500 mL

78. Refer to the given diagrammatic representation of the transportation of oxygen and carbon dioxide in the blood. P, Q, R, S and T represent percentage of both gases in different forms. Select the correct option for P-T.



- a)
- | P | Q | R | S | T |
|-----|-----|----|-----|----|
| 23% | 70% | 7% | 93% | 75 |
- b)
- | P | Q | R | S | T |
|----|-----|-----|----|-----|
| 7% | 23% | 70% | 3% | 97% |
- c)
- | P | Q | R | S | T |
|----|-----|-----|-----|----|
| 7% | 23% | 70% | 97% | 3% |
- d)
- | P | Q | R | S | T |
|-----|----|-----|-----|----|
| 70% | 7% | 23% | 97% | 3% |

79. Carbonic anhydrase occurs in ____

- a) lymphocytes b) blood plasma c) RBC d) leucocytes

80. Match column I with column II and select the correct option from the given codes.

Column I (Animals)	Column II (Respiratory structures)
A. Pigeon	(i) Book gills
B. Scorpion	(ii) Pharyngeal wall

C. Planaria	(iii) Lungs
D. Earthworm	(iv) Gills
E. Spiders	(v) Book lungs
F. King crab	(vi) Body surface
G. Prawn	(vii) Skin
H. Labeo	

- a) A-(iii), B-(v), C-(vi), D-(vii), E-(v), H(i), G-(iv), H-(iv)
 b) A-(v), B-(ii), C-(vi), D-(vii), E-(vi), F-(iv), G-(i), H-(iii)
 c) A-(vi), B-(iv), C-(vii), D-(v), E-(i), F-(ii), G-(iii), H-(vii)
 d) A-(i), B-(v), C-(vii), D-(iii), E-(vii), F-(ii), G-(iv), H-(vi)

81. When CO_2 concentration in blood increases, breathing becomes_____
- a) faster and deeper b) shallower and slow c) there is no effect on breathing
 d) slow and deep
82. Approximately seventy percent of carbon-dioxide absorbed by the blood will be transported to the lungs____
- a) as bicarbonate ions b) in the form of dissolved gas molecules c) by binding to R.B.C.
 d) as carbamino - haemoglobin
83. **Assertion:** Pneumotaxic centre, located in the medulla region of the brain, moderates the respiratory rhythm centre.
Reason: Pneumotaxic centre controls the switch 'ON' point of inspiration.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
84. The oxygen - haemoglobin dissociation curve will show a right shift in case of
- a) high PCO_2 b) high PO_2 c) low PCO_2 d) less H^+ concentration
85. Bulk of carbon dioxide released from body tissues into the blood is present as:
- a) Bicarbonate in blood plasma and RBCs b) Free CO_2 in blood plasma
 c) 70% carbamino-haemoglobin and 30% as bicarbonate d) Carbamino-haemoglobin in RBCs
86. Read the given statements and select the correct option.
- Statement 1: Rate of breathing is regulated by respiratory centres present in the medulla oblongata.
 Statement 2: Changes in the CO_2 level of the arterial blood control the rate of breathing.
- a) Both statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
 c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect.
87. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Tidal volume	(i) 2500-3000 mL of air
B. Inspiratory reserve volume	(ii) 1000 mL of air
C. Expiratory reserve volume	(iii) 500 mL of air
D. Residual volume	(iv) 3400-4800 mL of air
E. Vital capacity	(v) 1200 mL of air

- a) A-(iii), B-(iv), C-(ii), D-(i), E-(v) b) A-(iii), B-(i), C-(ii), D-(v), E-(iv)
 c) A-(iii), B-(i), C-(iv), D-(v), E-(ii) d) A-(v), B-(i), C-(ii), D-(iii), E-(iv)

88. Which of the following changes occur in diaphragm and intercostal muscles when expiration of air takes place?
- a) Internal intercostal muscles relax and diaphragm contracts
 - b) External intercostal muscles and diaphragm relax
 - c) Internal intercostal muscles contract and diaphragm relax
 - d) External intercostal muscles and diaphragm contract

89. Mark the correct pair of muscles involved in the normal breathing in humans
- a) External and internal intercostal muscles b) Diaphragm and abdominal muscles
 - c) Diaphragm and external intercostal muscles d) Diaphragm and intercostal muscles

90. Which of the following statements is true about RBCs in humans?
- a) They carry about 20-25 percent of CO_2 . b) They transport 99.5 percent of O_2 .
 - c) They transport about 80 percent oxygen only and the rest 20 percent of it is transported in dissolved state in blood plasma.
 - d) They do not carry CO_2 at all

91. What is the approximate normal composition of alveolar air?
- a) 14% oxygen, 6% carbon dioxide, 80% nitrogen
 - b) 21% oxygen, 2% carbon dioxide, 77% nitrogen
 - c) 16% oxygen, 3% carbon dioxide, 81% nitrogen
 - d) 10% oxygen, 8% carbon dioxide, 82% nitrogen

92. The oxygen dissociation curve is
- a) parabola b) slope c) sigmoid d) straight line

93. Name the chronic respiratory disorder caused mainly by cigarette smoking:
- a) Asthma b) Respiratory acidosis c) Respiratory alkalosis d) Emphysema

94. Fill up the blanks in the following paragraph by selecting the correct option.

The movement of air into and out of the lungs is carried out by creating a ____ (i) ____ between the lungs and the atmosphere. Inspiration can occur if intra-pulmonary pressure is ____ (ii) ____ than the atmospheric pressure. Expiration takes place when intra pulmonary pressure is ____ (iii) ____ than the atmospheric pressure. Inspiration is initiated by the ____ (iv) ____ of diaphragm which ____ (v) ____ the volume of thoracic chamber in the antero-posterior axis.

a)

(i)	(ii)	(iii)	(iv)	(v)
concentration gradient	less	higher	relaxation	increases

b)

(i)	(ii)	(iii)	(iv)	(v)
concentration gradient	higher	less	contraction	decreases

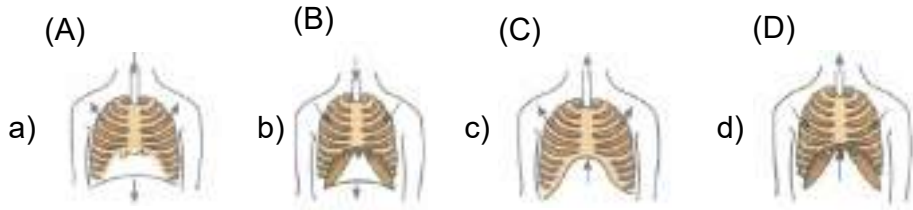
c)

(i)	(ii)	(iii)	(iv)	(v)
pressure gradient	higher	less	relaxation	decreases

d)

(i)	(ii)	(iii)	(iv)	(v)
pressure gradient	less	higher	contraction	increases

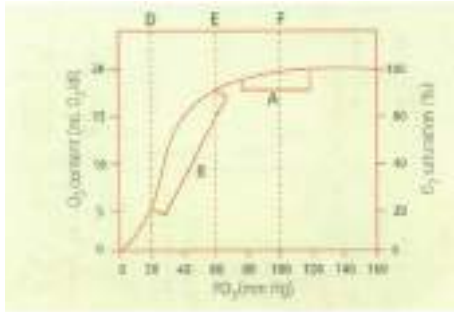
95. Exhalation is the process of expulsion of air through the respiratory tract. Which figure illustrates the process of exhalation?



96. Two friends are eating together on a dining table. One of them suddenly starts coughing while swallowing some food. This coughing would have been due to improper movement of

- a) Tongue b) Epiglottis c) Diaphragm d) Neck

97. How much oxygen will be released to the tissues by blood on passing from lungs to tissues?



- a) 15 mL of O₂/ 100 mL of blood b) 70 mL of O₂/ 100 mL of blood c) 5 mL of O₂/ 100 mL of blood
d) 20 mL of O₂/ 100 mL of blood

98. Respiratory Quotient (RQ) value of tripalmitin is _____

- a) 0.7 b) 0.07 c) 0.09 d) 0.9

99. Which of the following would have the same O₂ content?

- a) Blood entering the lungs and blood leaving the lungs
b) Blood entering the right side of the heart and blood leaving the right side of the heart
c) Blood entering the right side of the heart and blood leaving the left side of the heart
d) Blood entering the tissue capillaries and blood leaving the tissue capillaries

100. Consider the following four statements (i - iv) and select the correct option stating which ones are true (T) and which ones are false (F).

- (i) Formation of oxyhaemoglobin occurs on alveolar surface.
(ii) During gaseous exchange the gases diffuse from high partial pressure to low partial pressure.
(iii) Carbon dioxide cannot be transported with haemoglobin.
(iv) Earthworm respire through parapodia

a)	b)	c)	d)
(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)
T F T F	F F T F	F T F T	T T F F

101. If alveolar ventilation is 4200 mL/min, respiratory frequency is 12 breaths per minute, and tidal volume is 500 mL, what is the anatomical-dead-space ventilation?

- a) 1800 mL/min b) 6000 mL/min c) 350 mL/min d) 1200 mL/min

102. Read the following four statements (i) - (iv) with certain mistakes in two of them.

- (i) A water breather expends much more energy in ventilating its respiratory surface than an airbreathing one.
(ii) Lungs become empty after forceful expiration.

(iii) Exchange of gases in the lungs is interrupted during expiration.

(iv) Respiratory movements are controlled by CO_2 concentration of arterial blood.

Which of the above two statements have mistakes?

a) (i) and (iv) b) (ii) and (iii) c) (i) and (ii) d) (iii) and (iv)

103. The ventilation movements of the lungs in mammals are governed by

a) muscular walls of lung b) diaphragm c) costal muscles d) both (b) and (c).

104. Identify the correct statement with reference to transport of respiratory gases by blood.

a)

Haemoglobin is necessary for transport of carbon dioxide and carbonic anhydrase for transport of oxygen.

b)

Haemoglobin is necessary for transport of oxygen and carbonic anhydrase for transport of carbon dioxide.

c) Only oxygen is transported by blood. d) Only carbon dioxide is transported by blood.

105. Which of the following structures close the glottis during swallowing to prevent the entry of food into wind pipe?

a) Tongue b) Epiglottis c) Diaphragm d) Larynx

106. Vital capacity of lungs is

a) $\text{IRV} + \text{ERV}$ b) $\text{IRV} + \text{ERV} + \text{TV} - \text{RV}$ c) $\text{IRV} + \text{ERV} + \text{TV} + \text{RV}$ d) $\text{IRV} + \text{ERV} + \text{TV}$.

107. **Assertion:** Vocal cords consist of three pairs of mucous membrane that extend into the lumen of the larynx.

Reason: Sound is produced by only two pairs of cords.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

108. Skin is an accessory organ of respiration in _____

a) human b) frog c) rabbit d) lizard

109. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Trachea	(i) PO_2 in alveolar air
B. Respiratory centre	(ii) ATP
C. Yeast	(iii) Cartilaginous rings
D. Insects	(iv) Medulla oblongata
E. Fish	(v) Larynx
F. Biologically useful energy	(vi) Tracheal respiration
G. 100 mm Hg	(vii) Ethanol
H. Vocal cords	(viii) Branchial respiration

a) A-(iii), B-(iv), C-(vii), D-(vi), E-(viii), F-(ii), G-(i), H-(v)

b) A-(v), B-(ii), C-(vii), D-(viii), E-(vi), F-(iv), G-(i), H-(iii)

c) A-(vi), B-(iv), C-(viii), D-(v), E-(i), F-(ii), G-(iii), H-(vii)

d) A-(i), B-(v), C-(vii), D-(iii), E-(viii), F-(ii), G-(iv), H-(vi)

110. Name the pulmonary disease in which the alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls.

- a) Pleurisy b) Emphysema c) Pneumonia d) Asthma

111. Mark the true statement among the following with reference to normal breathing.

- a) Inspiration is a passive process whereas expiration is active
- b) Inspiration is an active process whereas expiration is passive
- c) Inspiration and expiration are active processes
- d) Inspiration and expiration are passive processes

112. When temperature decreases, oxy-Hb curve becomes:

- a) more steep b) straight c) parabola d) none of these.

113. Which of the following sequences is correct to initiate inspiration?

- (i) The contraction of external intercostal muscles raises the ribs and sternum
- (ii) Volume of thorax increases in the dorso-ventral axis
- (iii) Intrapulmonary pressure decreases
- (iv) Diaphragm contraction
- (v) Air rushes into lungs
- (vi) Volume of thorax increases in the anterior-posterior axis.

- a) (i), (ii), (iv), (v), (iii), (vi) b) (i), (ii), (iii), (iv), (vi), (v) c) (i), (ii), (iv), (vi), (iii), (v)
- d) (vi), (v), (i), (ii), (iii), (iv)

114. Which of these is incorrect regarding the given mechanism of breathing?



- a) Volume of thorax decreases b) Ribs and sternum are raised
- c) Diaphragm relaxes and arches upwards d) All of these

115. Assertion: A sigmoid curve is obtained when percentage saturation of haemoglobin with O_2 is plotted against the PO_2 .

Reason: Every 100 mL of oxygenated blood can deliver around 5mL of O_2 to the tissues under normal physiological conditions.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false

116. Which one of the following is a possibility for most of us in regard to breathing, by making a conscious effort?

- a) One can breathe out air totally without oxygen
- b) One can breathe out air through eustachian tubes by closing both the nose and the mouth
- c)

One can consciously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all.

- d) The lungs can be made fully empty by forcefully breathing out all air from them

117. Oxygen dissociation curve of haemoglobin is _____

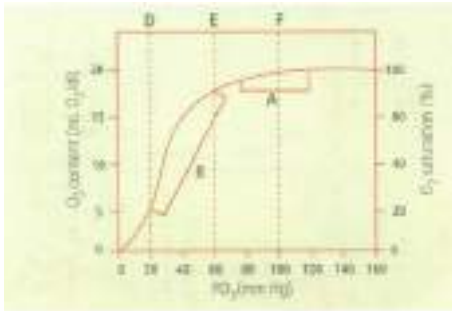
- a) sigmoid b) hyperbolic c) linear d) hypobolic

118. A person suffers punctures in his chest cavity in an accident, without any damage to the lungs, its effect could be
a) reduced breathing rate b) rapid increase in breathing rate c) no change in respiration
d) cessation of breathing.

119. The alveolar epithelium in the lung is____

- a) non-ciliated columnar b) non-ciliated squamous c) ciliated columnar d) ciliated squamous

120. Which of these is incorrect regarding A and B in the given graph?



- a) A is deoxygenated blood leaving the tissues b) B is reduced blood returning from tissues.
c) A is oxygenated blood leaving the lungs d) B is deoxygenated blood in the systemic veins.

121. Read the given statements and select the correct option.

Statement 1: Respiration is most efficient in the insects, among the invertebrates.

Statement 2: In the insects, air is carried directly to the cells by tracheoles.

- a) Both statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect.

122. **Assertion:** Alveoli are the primary sites for exchange of gases.

Reason: All factors in our body are favourable for diffusion of O_2 from alveoli to tissues and that of CO_2 from tissues to alveoli.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

123. Bulk of oxygen diffuses from the plasma into the red blood corpuscles where it joins loosely with Fe^{2+} ions of haemoglobin (Hb) to form bright red oxyhaemoglobin (HbO_2). The process is called

- a) oxidation b) oxygenation c) hydration d) dehydrogenation

124. Incidence of Emphysema - a respiratory disorder is high in cigarette smokers. In such cases

- a) the bronchioles are found damaged b) the alveolar walls are found damaged
c) the plasma membrane is found damaged d) the respiratory muscles are found damaged

125. In man and mammals, air passes from outside into the lungs through

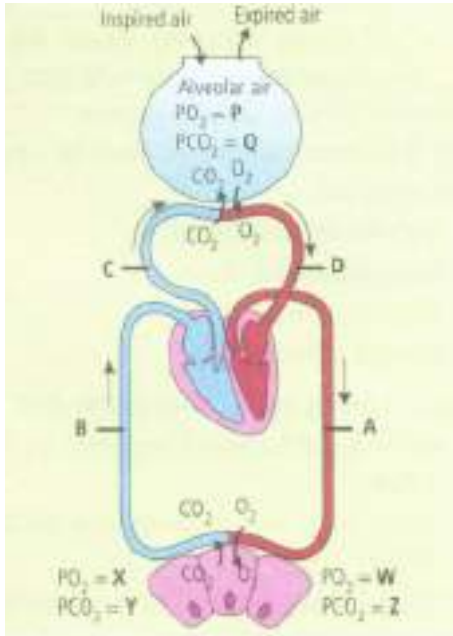
- a) nasal cavity, larynx, pharynx, trachea, bronchi, alveolisd
b) nasal cavity, pharynx, larynx, trachea, bronchioles, bronchi, alveoli
c) nasal cavity, larynx, pharynx, trachea, bronchioles, alveoli
d) nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, alveoli.

126. Which one of the following statements about blood constituents and transport of respiratory gases is most accurate?

- a) RBCs transport oxygen where as WBCs transport CO_2
b) RBCs transport oxygen where as plasma transports only CO_2

- c) RBCs as well as WBCs transport both oxygen and CO_2
 d) RBCs as well as plasma transport both oxygen and CO_2

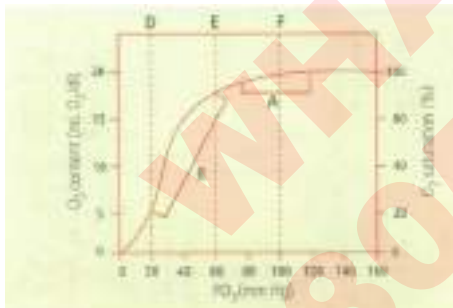
127. What is the value of W, X, Y and Z normally (in mmHg)?



a)	b)	c)	d)																																
<table border="1"><tr><td>W</td><td>X</td><td>Y</td><td>Z</td></tr><tr><td>95</td><td>40</td><td>45</td><td>40</td></tr></table>	W	X	Y	Z	95	40	45	40	<table border="1"><tr><td>W</td><td>X</td><td>Y</td><td>Z</td></tr><tr><td>95</td><td>40</td><td>40</td><td>45</td></tr></table>	W	X	Y	Z	95	40	40	45	<table border="1"><tr><td>W</td><td>X</td><td>Y</td><td>Z</td></tr><tr><td>40</td><td>45</td><td>95</td><td>40</td></tr></table>	W	X	Y	Z	40	45	95	40	<table border="1"><tr><td>W</td><td>X</td><td>Y</td><td>Z</td></tr><tr><td>95</td><td>45</td><td>40</td><td>40</td></tr></table>	W	X	Y	Z	95	45	40	40
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95	45	40	40																																

128. Fetal haemoglobin has X affinity for oxygen than that of mother's haemoglobin during gestation. X is
 a) same b) higher c) lower d) lower affinity earlier but higher later

129. Which of these is correct regarding D, E and F areas in the graph?



- a) D shows venous blood in exercise. b) E shows normal venous blood.
 c) F shows normal arterial blood. d) All of these

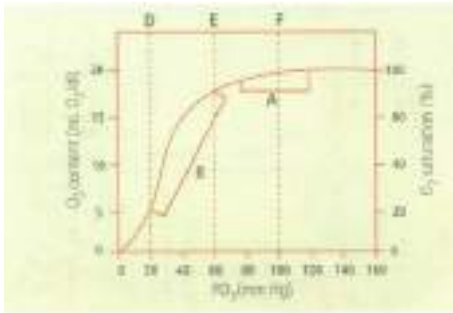
130. Read the following four statements carefully.

- Ventral respiratory group of neurons of medulla oblongata can cause both inspiration and expiration.
- The part of the respiratory system starting with the external nostrils up to the terminal bronchioles constitutes the respiratory or exchange part of the respiratory system.
- During swallowing epiglottis can be covered by a thin elastic cartilaginous flap called glottis to prevent the entry of food into the larynx.
- Binding of oxygen with haemoglobin is primarily related to partial pressure of O_2 .

Which of the above two statements are correct?

- a) (ii) and (iii) b) (iii) and (iv) c) (i) and (ii) d) (i) and (iv)

131. During strenuous exercise, the muscle interstitial fluid PO_2 falls to 20 mm Hg. The oxygen delivered by blood that passes through the exercising muscle tissues will be



- a) five times as much as normal b) double to the normal c) three times as much as normal
d) none of these.
132. The carbon dioxide is transported via blood to lungs as ____
a) dissolved in blood Plasma b) in the form of carbonic acid only
c) in combination with haemoglobin only d) carbamino haemoglobin and as carbonic acid
133. Which of the following statements is correct?
a) The contraction of internal intercostal muscles lifts up the ribs and sternum.
b) The RBCs transport oxygen only. c) The thoracic cavity is anatomically an air tight chamber.
d) Healthy man can inspire approximately 500 mL of air per minute.
134. Tidal Volume and Expiratory Reserve Volume of an athlete is 500 mL and 1000 mL, respectively. What will be his Expiratory Capacity if the Residual Volume is 1200 mL?
a) 1500 mL b) 1700 mL c) 2200 mL d) 2700 mL
135. A large proportion of oxygen is left unused in the human blood even after its uptake by the body tissues, This O_2 _____.
a) acts as a reserve during muscular exercise b) raise the pCO_2 of blood to 75 mm of Hg.
c) is enough to keep oxyhaemoglobin saturation at 96%
d) helps in releasing more O_2 to the epithelial tissues
136. Which structure of man is similar to spiracle of cockroach?
a) Nostril b) Bronchiole c) Lung d) Alveolus
137. According to Boyle's law, the product of pressure and volume is a constant. Hence,
a) if volume of lungs is increased, then pressure decreases proportionately
b) if volume of lungs is increased, then pressure also increases proportionately
c) if volume of lungs is increased, then pressure decreases disproportionately
d) if volume of lungs is increased, then pressure remains the same
138. At high altitude, the RBCs in the human blood will ____
a) increase in size b) decrease in size c) increase in number d) decrease in number
139. Given below is a list of different steps (i-vi) involved in respiration.
(i) Utilisation of O_2 by the cells for catabolic reactions.
(ii) Transport of gases by the blood.
(iii) Pulmonary ventilation by which atmospheric air is drawn in and CO_2 is released out.
(iv) Release of resultant CO_2 ,
(v) Diffusion of O_2 and CO_2 between blood and tissues.
(vi) Diffusion of gases (O_2 and CO_2) across alveolar tissues.
Select an option which has correct sequence of all the steps.

- a) (iii), (vi), (ii), (v), (i), (iv) b) (iii), (vi), (i), (v), (ii), (iv) c) (iv), (ii), (v), (iii), (i), (vi)
d) (iv), (vi), (ii), (v), (i), (iii)
140. Haldane effect plays more important role in promoting carbon dioxide transport than that of the Bohr's effect in promoting oxygen transport because
- a)
oxyhaemoglobin is a stronger acid which donates hydrogen ion (H^+) which in turn displace carbon dioxide from blood
- b)
carbaminohaemoglobin is a stronger acid which splits into hydrogen ion (H^+) and bicarbonate (HCO_3^-)
- c) carbon dioxide reacts with water to form carbonic acid that lowers the pH in tissue
- d) carbon dioxide is less soluble in venous blood than in arterial blood.
141. The process of migration of chloride ions from plasma to RBC and of carbonate ions from RBC to plasma is ____
- a) chloride shift b) ionic shift c) atomic shift d) Na^+ Pump
142. The respiratory centre in the brain is stimulated by
- a) CO_2 concentration in venous blood b) O_2 concentration in arterial blood
c) CO_2 concentration in arterial blood d) O_2 concentration in venous blood.
143. During winter a person died during sleep, the room was closed and a container with burnt charcoal was found in the room. What may be the possible reason of his death?
- a) Non-availability of oxygen b) Hb has more affinity to combine with carbon monoxide
c) Hb has more affinity to combine with carbon dioxide d) Combined effect of both (a) and (b)
144. Consider the following statements each with two blanks.
- (i) Actually, only about ____ (1) ____ mL of air enters the lung alveoli for the exchange of gases. The remaining fills the respiratory passage and is termed ____ (2) ____.
- (ii) The amount of air which one can inhale with maximum effort and also exhale with maximum effort is termed as ____ (3) ____ . It is about ____ (4) ____ in normal adult person.
- (iii) During normal quiet breathing, on an average, approximately ____ (5) ____ mL of air is inspired or expired by adult human male in each breath. It is termed as ____ (6) ____ volume.
- Which of the following options gives the correct fill-ups for the respective blank numbers from (1) to (6) in the above statements?
- a) (3)-vital capacity, (4)-4000 mL, (5)-500, (6)-tidal
b) (1)-1 00, (2)-residual volume, (3)-functional residual capacity, (4)-3000 mL
c) (1)-350, (2)-dead space air, (5)-1000, (6)-inspiratory reserve
d) (1)-350, (2)-residual volume, (3)-vital capacity, (4)-4000 mL
145. Which of the following is true for CO_2 concentration?
- a) More in alveolar air than in expired air b) More in expired air than in alveolar air
c) More in inspired air than in alveolar air d) More in inspired air than in expired air
146. If $P_{atm} = 0$ mm Hg and $P_{alv} = -2$ mm Hg, then
- a) it is the end of the normal inspiration and there is no airflow
b) it is the end of the normal expiration and there is no airflow
c) transpulmonary pressure (P_{tp}) is -2 mm Hg d) air is flowing into the lungs.

147. Identify the wrong statement with reference to transport of oxygen_____

- a) Higher H^+ conc. in alveoli favours the formation of oxyhaemoglobin
- b) Low pCO_2 in alveoli favours the formation of oxyhaemoglobin
- c) Binding of oxygen with haemoglobin is mainly related to partial pressure of O_2
- d) Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin.

148. Read the given statements and select the correct option.

Statement 1: About 70% of CO_2 that enters RBCs changes into HCO_3^- for transport in plasma to the lungs where it reconverts into CO_2 for elimination.

Statement 2: About 40% of CO_2 that enters RBCs changes into carbaminohaemoglobin which releases O_2 in the lungs.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

149. Carbon monoxide can kill a person because of it's extremely high affinity for

- a) haemoglobin
- b) phytochrome
- c) cytochrome
- d) none of these

150. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. TV + ERV	(i) Expiratory capacity
B. RV + ERV + TV + IRV	(ii) Total lung capacity
C. ERV + RV	(iii) Functional residual capacity

- a) A-(i), B-(ii), C-(iii)
- b) A-(iii), B-(i), C-(ii)
- c) A-(iii), B-(ii), C-(i)
- d) A-(ii), B-(iii), C-(i)

151. Pneumotaxic centre which can moderate the functions of the respiratory rhythm centre is present in

- a) pons region of brain
- b) thalamus
- c) spinal cord
- d) right cerebral hemisphere.

152. The partial pressure of oxygen in the alveoli of the lungs is:

- a) Equal to that in the blood
- b) More than that in the blood
- c) Less than that in the blood
- d) Less than that of carbon dioxide

153. Complete the following sentence by selecting the correct option.

Receptors associated with aortic arch and carotid artery can recognise changes

in____(i)____and____(ii)____concentration and send necessary signals to____(iii)____for remedial actions.

a)

(i)	(ii)	(iii)
O_2	CO_2	pneumotaxic centre

b)

(i)	(ii)	(iii)
CO_2	H^+	pneumotaxic centre

c)

(i)	(ii)	(iii)
CO_2	H^+	apneustic centre

d)

(i)	(ii)	(iii)
O_2	H^+	pneumotaxic centre

154. During expiration, the diaphragm becomes

- a) dome-shaped
- b) oblique
- c) concave
- d) flattened.

155. The exchange of gases in the alveoli of the lungs takes place by_____

- a) simple diffusion
- b) osmosis
- c) active transport
- d) passive transport

156. **Assertion:** Emphysema is the permanent abnormal inflation of airspace of terminal bronchioles or alveolar sacs.

Reason: Destruction of pulmonary tissues specially alveolar septa and flattening of alveolar ducts occur in emphysema.

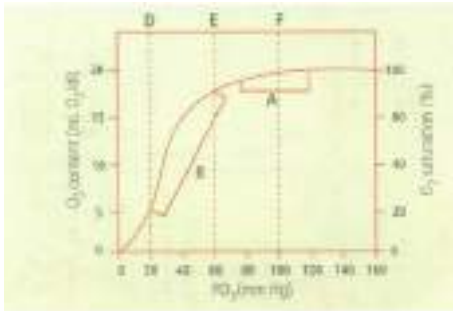
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.

157. **Assertion:** The abdominal muscles are primarily involved in generating pressure gradient between the lungs and the atmosphere.

Reason: The strength of inspiration and expiration can be increased by additional muscles in diaphragm and intercostal muscles.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false

158. Blood can combine with almost _____ of oxygen if the haemoglobin is 100 per cent saturated.



- a) 18 mL b) 15 mL c) 20 mL d) 10 mL

159. Mammalian lungs have an enormous number of minute alveoli (air sacs). This is to allow

- a) more surface area for diffusion of gases
 b) more space for increasing the volume of inspired air
 c) more nerve supply to keep the lungs working
 d) more spongy texture for keeping lung in proper shape.

160. Which two of the following changes (i-v) usually tend to occur in the plain dwellers when they move to high altitudes (3,500 m or more)?

- (i) Increase in red blood cell size
 (ii) Increase in red blood cell production
 (iii) Increased breathing rate
 (iv) Increase in thrombocyte count

Changes occurring are:
 a) (ii) and (iii) b) (iii) and (iv) c) (i) and (iv) d) (i) and (ii)

161. Read the given statements characterising certain types of animals. Select the option which correctly exemplifies each of these types.

- (i) Animal having external gills
 (ii) Animal having internal gills
 (iii) Animal showing tracheal respiration
 (iv) Animal revealing buccopharyngeal respiration

a)

(i)	(ii)	(iii)	(iv)
Prawn	Arenicola	Unio	Fish

b)

(i)	(ii)	(iii)	(iv)
Necturus	Unio	Prawn	Frog

c)

(i)	(ii)	(iii)	(iv)
Pila	Arenicola	Unio	Toad

d)

(i)	(ii)	(iii)	(iv)
Necturus	Pila	Millipede	Toad

162. Consider the following statements each with one or two blanks.

- (i) Left lung has ____ (1) ____ lobes and right lung has ____ (2) ____ lobes.
 (ii) Prawn respire with ____ (3) ____ and insects with ____ (4) ____.
 (iii) Amount of air inhaled and exhaled with maximum effort is referred to as the ____ (5) ____ of the lungs.

Fill up the above blanks by selecting the correct option.

- a) (1) - three, (2) - two, (3) - gills (4)-tracheae b) (1) - two, (2) - three, (5) - vital capacity
 c) (3) - gills, (4) - tracheae, (5) - tidal volume d) (3) - tracheae, (4) - gills, (5) - tidal volume

163. Thoracic chamber is formed dorsally by the ____ (i) ____, ventrally by the ____ (ii) ____ laterally by the ____ (iii) ____ and on lower side by the dome shaped ____ (iv) ____.

Select the correct option to complete the above paragraph.

a)

(i)	(ii)	(iii)	(iv)
vertebral column	sternum	ribs	diaphragm

b)

(i)	(ii)	(iii)	(iv)
sternum	vertebral column	diaphragm	ribs

c)

(i)	(ii)	(iii)	(iv)
diaphragm	ribs	vertebral column	sternum

d)

(i)	(ii)	(iii)	(iv)
ribs	diaphragm	vertebral column	sternum

164. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Tracheoles	(i) Yeast
B. Carbonic anhydrase	(ii) Fish
C. Lactic acid	(iii) Inspiration
D. Fermentation	(iv) Vital capacity
E. Gill filaments	(v) Fast muscle
F. Cutaneous respiration	(vi) Insect
G. Diaphragm	(vii) Bicarbonates
	(viii) Earthworm

- a) A-(viii), B-(vii), C-(i), D-(iv), E-(ii), F-(vi), G-(v) b) A-(vi), B-(vii), C-(v), D-(i), E-(ii), F-(viii), G-(iii)
 c) A-(viii), B-(iv), C-(vii), D-(i), E-(iii), F-(ii), G-(v) d) A-(vi), B-(i), C-(ii), D-(v), E-(iv), F-(viii), G-(iii)

165. **Assertion:** At the tissue level, 70 percent of CO₂ formed from catabolism is trapped as bicarbonate in the RBCs.

Reason: At tissue level, carbonic anhydrase in RBCs facilitates the formation of CO₂ and H₂O from bicarbonate.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false

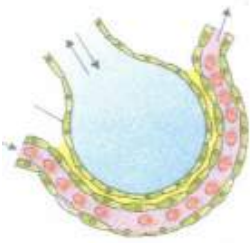
166. Blood analysis of a patient reveals an unusually high quantity of carboxyhaemoglobin content. Which of the following conclusions is most likely to be correct? The patient has been inhaling polluted air containing unusually high content of:

- a) carbon disulphide b) chloroform c) carbon dioxide d) carbon monoxide.

167. During rest, the metabolic needs of the body are at their minimum. Which of the following is indicative of this situation?

- a) Rate of breathing b) O₂ intake and CO₂ output c) Pulse rate d) All of these

168. The factor which does not affect the rate of alveolar diffusion is



- a) solubility of gases b) thickness of the membranes c) pressure gradient
d) reactivity of the gases.
169. **Assertion:** Inspiration occurs when there is a negative pressure in the lungs with respect to the atmospheric pressure.
Reason: During inspiration, a decrease in pulmonary volume increases the intra-pulmonary pressure than atmospheric pressure which forces the air from outside to move into the lungs.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
170. The CO_2 content by volume, in the atmospheric air is about
a) 3.34% b) 4% c) 0.0314% d) 2.1%



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

BODY FLUIDS AND CIRCULATION 1

Marks : 880

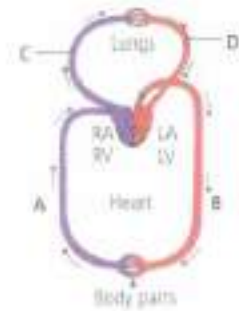
1. In ECG, P-R interval corresponds to:
a) time delay in A-V node b) SeA nodal conduction time c) increased ventricular contraction
d) time interval between onset of ventricular contraction
2. Read the following statements and select the correct ones
(i) Nodal tissue is specialised cardiac musculature in human heart which has the ability to generate action potential due to an external stimuli
(ii) Position of SAN - right corner of right atrium
(iii) Position of AVN - right corner of ventricle
(iv) AV bundle continues from AVN
(v) Purkinje fibres are modified cardiac muscle fibres that originate from the atrioventricular node and spread into the two ventricles.
a) (i) and (ii) b) (i) and (iii) c) (ii), (iv) and (v) d) All of these
3. Removal of calcium from freshly collected blood would _____
a) cause delayed clotting b) prevent clotting c) cause immediate clotting
d) prevent destruction of hemoglobin
4. In a healthy adult man, the smallest type of leucocytes are
a) basophils b) monocytes c) eosinophils d) lymphocytes
5. In the ABO system of blood groups. if both antigens are present but no antibody, the blood group of the individual would be _____.
a) B b) O c) AB d) A
6. Which one of the following statements is correct regarding blood pressure?
a) 130/90 mm Hg is considered high and requires treatment
b) 100/55 mm Hg is considered an ideal blood pressure
c) 105/50 mm Hg makes one very active
d) 190/110 mm Hg may harm vital organs like brain and kidney
7. Which type of white blood cells are concerned with the release of histamine and natural anticoagulant heparin?
a) Monocytes b) Neutrophils c) Basophils d) Eosinophils
8. Which one of the following blood cells is involved in antibody production?
a) B-Lymphocytes b) T-Lymphocytes c) RBC d) Neutrophils
9. Which one of the following mammalian cells is not capable of metabolising glucose to carbon-dioxide aerobically?
a) unstrained muscle cells b) liver cells c) red blood cells d) white blood
10. Which one of the following statements is correct with regard to the principle of safe blood transfusion?

- a) The donor's red blood corpuscles should not contain antibodies against the recipient's serum
 b) The recipient's serum should not contain antigens against the donor's antibodies
 c)
 The recipient's serum should not contain the antibodies against the red blood corpuscles of the donor
 d) The recipient's red blood corpuscles should not contain antibodies against the donor's antigen

11. Which of the following is not main function of lymph glands?

- a) Forming WBC b) Forming antibodies c) Forming RBC d) Destroying bacteria

12. What is the nature of blood passing through blood vessels A, B, C and D respectively?



a)

A	B	C	D
Deoxygenated	Oxygenated	Deoxygenated	Oxygenated

b)

A	B	C	D
Deoxygenated	Deoxygenated	Oxygenated	Oxygenated

c)

A	B	C	D
Oxygenated	Oxygenated	Deoxygenated	Deoxygenated

d)

A	B	C	D
Oxygenated	Deoxygenated	Oxygenated	Deoxygenated

13. Read the following statements and select the correct option.

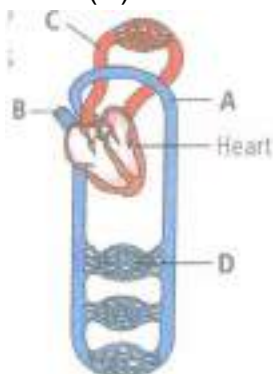
Statement 1: Prothrombin is essential for blood clotting

Statement 2: Prothrombin is synthesised in the liver in the presence of Ca^{++}

- a) Both statements 1 and 2 are correct b) Statement 1 is correct but statement 2 is incorrect
 c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect

14. The given figure is of circulatory system. Identify the labelled parts (A-D) from the list (i-vii). B

- (i) Pulmonary circulation (ii) Systemic circulation (iii) Superior vena cava (iv) Inferior vena cava (v) Aorta (vi) Veins and venules (vii) Arterioles and capillaries



a)	b)	c)	d)																																
<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(v)</td><td>(iii)</td><td>(i)</td><td>(vii)</td></tr></table>	A	B	C	D	(v)	(iii)	(i)	(vii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(vii)</td><td>(iv)</td><td>(i)</td><td>(vi)</td></tr></table>	A	B	C	D	(vii)	(iv)	(i)	(vi)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(v)</td><td>(iii)</td><td>(ii)</td><td>(vii)</td></tr></table>	A	B	C	D	(v)	(iii)	(ii)	(vii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(vii)</td><td>(v)</td><td>(i)</td><td>(vi)</td></tr></table>	A	B	C	D	(vii)	(v)	(i)	(vi)
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(v)	(iii)	(ii)	(vii)																																
A	B	C	D																																
(vii)	(v)	(i)	(vi)																																

15. Match the following columns and select the correct option

Column - I	Column - II
A. Eosinophils	(i) Immune response
B. Basophils	(ii) Phagocytosis
C. Neutrophils	(iii) Release histaminases, destructive Enzymes
D. Lymphocytes	(iv) Release granules containing histamine

a) (i),(ii),(iv),(iii) b) (ii),(i),(iii),(iv) c) (iii),(iv),(ii),(i) d) (iv),(i),(ii),(iii)

16. Read the following statements carefully.

- (i) In fishes, the heart pumps out deoxygenated blood which is oxygenated by the gills and supplied to the body parts from where deoxygenated blood is returned to the heart.
- (ii) The openings of the right and the left ventricles into pulmonary artery and aorta respectively are provided with the mitral valves.
- (iii) The nodal musculature has the ability to generate action potentials without any external stimuli, i.e. it is autoexcitable.
- (iv) The T-wave of ECG represents depolarisation of the ventricles.

Which of the above two statements are incorrect?

a) (i) and (iii) b) (ii) and (iv) c) (i) and (ii) d) (iii) and (iv)

17. An adult human with average health has systolic and diastolic pressures as

- a) 120 mm Hg and 80 mm Hg b) 50 mm Hg and 80 mm Hg c) 80 mm Hg and 80 mm Hg
- d) 70 mm Hg and 120 mm Hg

18. Person with blood group AB is considered as universal recipient because he has _____.

- a) both A and B antigens on RBC but no antibodies in the plasma.
- b) both A and B antibodies in the plasma. c) no antigen on RBC and no antibody in the plasma.
- d) both A and B antigens in the plasma but no antibodies

19. In which one of the following pairs, two terms represent the same thing?

- a) Atrioventricular node - pacemaker b) Lymphocyte - erythrocyte c) Plasma - serum
- d) Mitral valve - bicuspid valve

20. Blood pressure in the mammalian aorta is maximum during _____

- a) Diastole of the right ventricle b) Systole of the left ventricle c) Diastole of the right atrium
- d) Systole of the left atrium

21. The most active phagocytic white blood cells are _____

- a) neutrophils and eosinophils b) lymphocytes and macrophages
- c) eosinophils and lymphocytes d) neutrophils and monocytes

22. 'Bundle of His, is a part of which one of the following organs in humans?

- a) Brain b) Heart c) Kidney d) pancreas

23. Which one of the following animals has two separate circulatory pathways?

- a) Lizard b) Whale c) Shark d) Frog

24. Pacemaker is situated in the

- a) wall of right atrium b) interauricular septum c) interventricular septum d) wall of left atrium.

25. As per the guidelines of the Indian Red Cross Society, which of the following persons is recommended for blood donation?
- a) People not in good health, under the influence of alcohol or drugs
 - b) Ladies during menstruation, pregnancy and breast feeding
 - c) Healthy women but unwed and below the age of 35
 - d) Persons who are immunised with live vaccines
26. Given below are the figures of blood vessels. Identify them and select the correct option.



- a)
- | A | B | C |
|-----------|------|--------|
| Capillary | Vein | Artery |
- b)
- | A | B | C |
|--------|-----------|------|
| Artery | Capillary | Vein |
- c)
- | A | B | C |
|------|-----------|--------|
| Vein | Capillary | Artery |
- d)
- | A | B | C |
|------|--------|-----------|
| Vein | Artery | Capillary |

27. Assertion: Double circulation is incomplete in amphibians and reptiles.
Reason: Unlike in birds and mammals, in amphibian and reptiles, the left atrium receives oxygenated blood and right atrium receives deoxygenated blood.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false.
 - d) If both assertion and reason are false.
28. Refer to the given electrocardiogram and select the correct statement.
-
- a) It shows electrocardiogram of a healthy person
- b) It shows partial blockage due to damaged AV nodes
- c) It shows complete blockage and there is no synchrony between atrial and ventricular activities
- d) It shows that muscles of the heart are weak.
29. Impulse of heart beat originates from____
- a) S. A. node
 - b) A.V. node
 - c) Vagus nerve
 - d) Cardiac nerve
30. The rate of heartbeat is regulated by the integrated activity of inhibiting and accelerating effects occurring in which part of the brain?
- a) Cerebellum
 - b) Diencephalon
 - c) Medulla oblongata
 - d) Pons Varolii
31. The life span of thrombocytes is
- a) 4 to 5 weeks
 - b) 3 to 4 weeks
 - c) 3 to 7 days
 - d) none of these
32. Which one of the following statements is incorrect?
- a) The presence of nonrespiratory air sacs, increases the efficiency of respiration in birds.
 - b) In insects, circulating body fluids serve to distribute oxygen to tissues.
 - c) The principle of countercurrent flow facilitates efficient respiration in gills of fishes.
 - d) The residual area in lungs slightly decreases the efficiency of respiration in mammals.
33. The antibodies are____
- a) germs
 - b) carbohydrates
 - c) proteins
 - d) lipids
34. The correct route through which pulse-making impulse travels in the heart is____
- a) AV node → Bundle of His → SA node → purkinje fibres → Heart muscles
 - b) AV node → SA node → purkinje fibres → Bundle of His → Heart muscles

- c) SANode → Purkinje fibres → Bundle of His → AVnode → Heart muscles
d) SANode → AV node → Bundle of His → Purkinje fibres → Heart muscles

35. Wall of blood capillary is formed of _____

- a) haemocytes b) parietal cells c) endothelial cells d) optic cells

36. Assertion: Left atrium has the thickest muscles.

Reason: Right atrium receives blood from the lungs

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false

37. In the given figure of the heart which of the labelled part (1,2,3,4,5) carries oxygenated blood?



- a) 1, 2, 3 and 4 b) 1 and 5 c) 1 and 4 d) 3 and 5

38. Pacemaker of heart is _____.

- a) AV node b) bundle of His c) SANode d) Purkinje fibres

39. A red blood cell, entering the right side of the heart passes by or through the following structures.

1. Atrioventricular valves
2. Semilunar valves
3. Right atrium
4. Right ventricle
5. SAN

Which of the following options represents the correct sequence?

- a) 2 → 3 → 1 → 4 → 5 b) 3 → 1 → 5 → 2 → 4 c) 3 → 5 → 1 → 2 → 4
d) 5 → 3 → 1 → 4 → 2

40. Anti-A and Anti-B antibodies are not found in which of the following blood group?

- a) AB b) A c) O d) B

41. Match column I with column II and select the correct option from the codes given below

	Column-I		Column-II
A	Factor II	(i)	Thromboplastin
B	Factor III	(ii)	Prothrombin
C	Factor VIII	(iii)	Hageman factor
D	Factor XII	(iv)	Antihemophilic globulin

- a) A-(iii), B-(iv), C-(ii), D-(i) b) A-(iv), B-(iii), C-(ii), D-(i) c) A-(ii), B-(i), C-(iv), D-(ii)
d) A-(i), B-(ii), C-(iii), D-(iv)

42. What is the oxidation state of iron in haemoglobin?

- a) Fe⁻ b) Fe²⁺ c) Fe³⁺ d) Fe⁴⁺

43. Which one engulfs pathogens rapidly _____

- a) Acidophils b) Monocytes c) Basophils d) Neutrophils

44. Which of the following sequences is truly a systemic circulation pathway?
- a) Right ventricle \rightarrow Pulmonary aorta \rightarrow Tissues \sim Pulmonary veins \rightarrow Left auricle
 - b) Right auricle \rightarrow Left ventricle \rightarrow Aorta \rightarrow Tissues \rightarrow Veins \rightarrow Right auricle
 - c) Left auricle \rightarrow Left ventricle \rightarrow Pulmonary aorta \rightarrow Tissues \rightarrow Right auricle
 - d) Left auricle \rightarrow Left ventricle \rightarrow Aorta \rightarrow Arteries \rightarrow Tissues \rightarrow Veins \rightarrow Right atrium
45. Which of the following blood groups is a universal recipient in blood transfusion?
- a) Group AB b) Group B c) Group A d) Group O
46. A certain road accident patient with unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor?.
- a) Blood group B b) Blood group AB c) Blood group O d) Blood group A
47. If the systolic pressure is 120 mm Hg and diastolic pressure is 80 mm Hg, the pulse pressure is _____
- a) $120 \times 80 = 9600$ mm Hg b) $120 + 80 = 200$ mm Hg c) $120 - 80 = 40$ mm Hg
 - d) $\frac{120}{80=1.5} mmHg$
48. Which of the following statement(s) regarding the cardiac system is/are correct?
- (i) Human heart is an ectodermal derivative.
 - (ii) Mitral valve guards the opening between the right atrium and left ventricle.
 - (iii) SAN is located on the left upper corner of the right atrium.
 - (iv) Stroke volume \times Heart rate = Cardiac output.
- a) (i) only b) (i) and (ii) c) (ii) and (iii) d) (iv) only
49. Splenic artery arise from _____
- a) anterior mesenteric artery b) coeliac artery (or celiac artery) c) posterior mesenteric artery
 - d) intestinal artery
50. Assertion: There are 72-75 heart beats per minute on an average when a person is performing normal work
Reason: One heart beat is completed in 0.8 second
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false d) If both assertion and reason are false
51. Which of the following correctly explains a phase/event in cardiac cycle in a standard electrocardiogram?
- a) QRS complex indicates atrial contraction. b) QRS complex indicates ventricular contraction
 - c) Time between S and T represents atrial systole
 - d) P-wave indicates beginning of ventricular contraction.
52. Assertion : Lymph in lymphatic system is known as tissue fluid.
Reason: It consists of plasma proteins, RBCs and WBCs.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false d) If both assertion and reason are false
53. One of the common symptoms observed in people infected with dengue fever is

- a) significant decrease in RBC count b) significant decrease in WBC count
c) significant decrease in platelets count d) significant increase in platelets count
54. A person with blood group A requires blood. The blood group which can be given is ____
a) A and B b) A and AB c) A and O d) A, B, AB and O
55. Read the following statements and choose the correct option
Statement 1: Atria receive blood from all parts of the body which subsequently flows to ventricles.
Statement 2: Action potential generated at sino-atrial node passes from atria to ventricles.
a) Action mentioned in Statement 1 is dependent on action mentioned in Statement 2
b) Action mentioned in Statement 2 is dependent on action mentioned in Statement 1
c) Actions mentioned in Statements 1 and 2 are independent of each other
d) Actions mentioned in Statements 1 and 2 are synchronous
56. Detection of blood groups is done by agglutination test using antiserum. According to this method, if the blood shows coagulation with
a) antiserum B, blood group is AB b) antiserum B, blood group is B
c) antiserum A and B, blood group is O d) antiserum A, blood group is O.
57. The second heart sound (dubb) is associated with the closure of
a) tricuspid valve b) semilunar valves c) bicuspid valve d) tricuspid and bicuspid valves.
58. Arteries are best defined as the vessels which ____
a) supply oxygenated blood to the different organs
b) break up into capillaries which reunite to form one visceral organ
c) break up into capillaries which reunite to form a vein
d) carry blood from one visceral organ to another visceral organ
59. Assertion: The cardiac output of an ordinary man and of an athlete is the same
Reason: It is impossible to alter the stroke volume as well as heart rate
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false
60. Identify the following type of blood cells and mark the correct option.



a)

A	B	C	D	E
Monocyte	Eosinophil	Neutrophil	Basophil	Blood platelets

b)

A	B	C	D	E
Monocyte	Basophil	Neutrophil	Blood platelets	Eosinophil

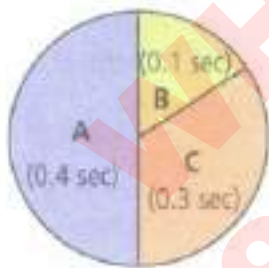
c)

A	B	C	D	E
Basophil	Blood platelets	Monocyte	Eosinophil	Neutrophil

d)

A	B	C	D	E
Basophil	Blood platelets	Eosinophil	Neutrophil	Monocyte

61. Which among the following is correct during each cardiac cycle?
- The volume of blood pumped out by the Rt (Right) and Lt (Left) ventricles is same
 - The volume of blood pumped out by the Rt and Lt ventricles is different
 - The volume of blood received by each atrium is different
 - The volume of blood received by the aorta and pulmonary artery is different
62. Which one of the following vertebrate organs receives the oxygenated blood only?
- Gill
 - Lung
 - Liver
 - Spleen
63. Which of the following statements are incorrect?
- Leucocytes disintegrate in spleen and liver.
 - RBCs, WBCs and blood platelets are produced by bone marrow
 - Neutrophils bring about destruction and detoxification of toxins of protein origin
 - Important function of lymphocytes is to produce antibodies.
- (i) and (ii)
 - (i) and (iv)
 - (i) and (iii)
 - (ii) and (iii)
64. In the given figure the durations of the events of the cardiac cycle are given. Identify these events and select the correct option.



a)

A	B	C
Auricular systole	Joint diastole	Ventricular systole

b)

A	B	C
Ventricular systole	Joint diastole	Auricular systole

c)

A	B	C
Ventricular systole	Auricular systole	Joint diastole

d)

A	B	C
Joint diastole	Auricular systole	Ventricular systole

65. Assertion : Fibrins are formed by the conversion of inactive fibrinogens in the plasma by the enzyme thrombin.
- Reason : Plasma without fibrinogen and blood corpuscles is called serum

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
66. Read the following statements and select the correct option
Statement 1: The 4-chambered heart of birds is superior to the 4-chambered heart of crocodiles
Statement 2: Crocodilian heart retains both systemic arches that join, causing mixing of blood in the dorsal aorta while avian heart has lost left systemic arch
a) Both statements 1 and 2 are correct b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect
67. Tricuspid valve is found in between _____.
a) sinus venosus and right auricle b) right auricle and right ventricle
c) left ventricle and left auricle d) ventricle and aorta
68. Bundle of His is a part of which one of the following organs in human?
a) Brain b) Heart c) Kidney d) Pancreas
69. Assertion: Atria act as primer pumps that increase the ventricular pumping
Reason: About 80 percent of the blood flows directly through the atria into ventricle
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false
70. Which of the following statements is correct?
a) The T-wave in an ECG represents excitation of ventricles
b)
The sum of P and T waves in a given time period can determine the heart beat rate of an individual.
c) The end of the P-wave marks the end of the systole
d) In a standard ECG, a person is connected to the machine with three electrical leads.
71. Consider the following four statements and select the correct option stating which ones are true (T) and which ones are false (F)?
(i) Proteins contribute 6 - 8% of the blood plasma.
(ii) Plasma contains very high amount of minerals.
(iii) Plasma without the clotting factors is called serum.
(iv) Glucose, amino acids, lipids, etc., are also present in the plasma as they are always in transit in the body
a) b) c) d)

(i)	(ii)	(iii)	(iv)
F	F	T	T

(i)	(ii)	(iii)	(iv)
T	F	T	T

(i)	(ii)	(iii)	(iv)
T	T	F	F

(i)	(ii)	(iii)	(iv)
F	F	F	T
72. In a cardiac output of 5250 mL per minute, with 75 heartbeats per minute, the stroke volume is
a) 60 mL b) 80 mL c) 55 mL d) 70 mL
73. Match the items given in Column I with those in Column II and select the correct option given below:

Column I	Column II
(A) Fibrinogen	(i) Osmotic balance
(B) Globulin	(ii) Blood clotting
(C) Albumin	(iii) Defence mechanism

a)

A	B	C
(i)	(iii)	(ii)

b)

A	B	C
(i)	(ii)	(iii)

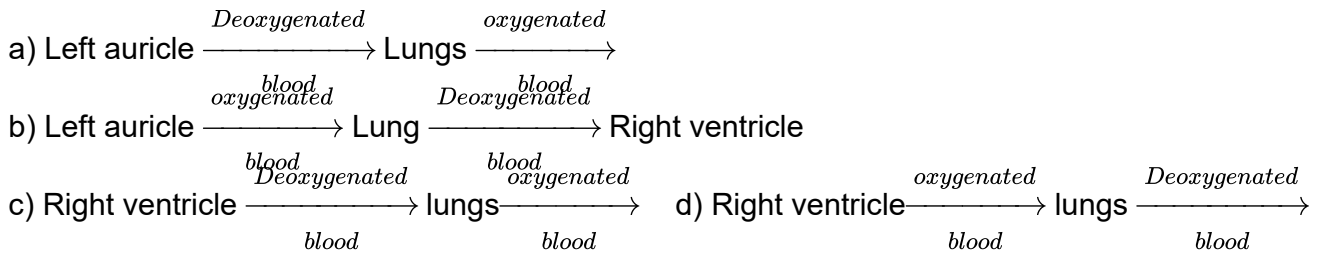
c)

A	B	C
(iii)	(ii)	(i)





d)

A	B	C
(ii)	(iii)	(i)

74. Which of the following cells does not exhibit phagocytic activity
a) Monocytes b) Neutrophil c) Basophil d) Macrophage
75. Bundle of His is a network of ____
a) nerve fibres found throughout the heart b) muscle fibres distributed throughout the heart walls
c) muscle fibres found only in the ventricle wall d) nerve fibres distributed in ventricles
76. Antigens are present ____
a) inside the nucleus b) on cell surface c) inside the cytoplasm d) on nuclear membrane
77. During ventricular systole
a)
oxygenated blood is pumped into the pulmonary artery and deoxygenated blood is pumped into the artery
b)
oxygenated blood is pumped into the aorta and deoxygenated blood is pumped into the pulmonary vein
c)
oxygenated blood is pumped into the pulmonary vein and deoxygenated blood is pumped into the pulmonary artery
d)
oxygenated blood is pumped into the aorta and deoxygenated blood is pumped into the pulmonary artery
78. Assertion: Neural signals through sympathetic nerves can increase the strength of ventricular contraction.
Reason: Parasympathetic neural signals synergistically act with sympathetic neural signal to increase the cardiac output.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false
79. Globulins contained in human blood plasma are primarily involved in _____.
a) osmotic balance of body fluids b) oxygen transport in the blood c) clotting of blood
d) defence mechanisms of body
80. Prothrombin, which helps in clotting of blood, is released by
a) monocytes b) erythrocytes c) lymphocytes d) blood platelets.
81. Clumping of RBC may occur when blood of one person is mixed with serum or blood of another person. This is due to
a) antigen-antibody reaction b) antitoxin-antibody reaction c) antigen-antigen reaction
d) antibody-antibody reaction.
82. Erythropoiesis starts in ____
a) Liver b) Spleen c) Red bone marrow d) Kidney
83. Choose the schematic diagram which properly represents pulmonary circulation in humans.



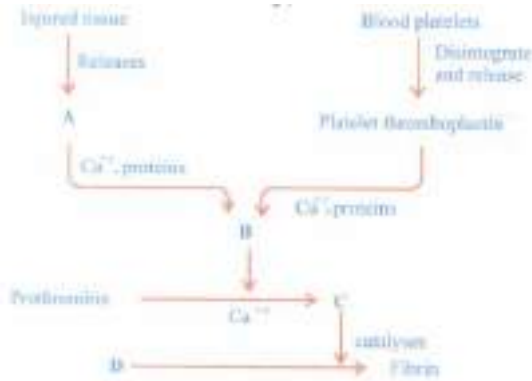
84. The hepatic portal vein drains blood to liver from:
a) Heart b) Stomach c) Kidneys d) Intestine
85. Which of the following factors is known as Christmas factor?
a) Factor VIII b) Factor XII c) Factor IV d) Factor IX
86. Agranulocytes responsible for immune response of the body are
a) basophils b) neutrophils c) eosinophils d) lymphocytes
87. Which of the following chambers of the heart has the thickest muscular wall?
a) Left atrium b) Right atrium c) Right ventricle d) Left ventricle
88. Open circulatory system is present in (i) and (ii). Fill the correct option for (i) and (ii).
a) (i)-platyhelminthes (ii)-molluscs
b) (i)-arthropods (ii)-echinoderms
c) (i)-annelids (ii)-arthropods
d) (i)-arthropods (ii)-molluscs
89. During acute myocardial infarction which of the following changes occurs in the ECG ?
a) Flattened T wave b) Depressed ST segment c) Elevated ST segment
d) Increased length of PO interval
90. ABO blood groups in humans are controlled by the gene I. It has three alleles - I^A , I^B and I. Since there are three different alleles; six different genotypes are possible. How many phenotypes can occur _____.
a) 3 b) 1 c) 4 d) 2
91. Mark the pair of substances among the following which is essential for coagulation of blood:
a) Heparin and calcium ions b) Calcium ions and platelet factors c) Oxalates and citrates
d) Platelet factors and heparin
92. Match column I with column II and select the correct option from the codes given below
- | Column I
(Plasma protein) | | Column II
(Functions) | |
|------------------------------|-------|--------------------------|--|
| A Fibrinogen | (i) | Defence mechanism | |
| B Globulins | (ii) | Osmotic balance | |
| C Albumins | (iii) | Coagulation of blood | |
- a) A-(iii), B-(i), C-(ii) b) A-(i), B-(iii), C-(ii) c) A-(iii), B-(ii), C-(i) d) A-(ii), B-(i), C-(iii)
93. Which of the following parts of heart first receives deoxygenated blood?
a) Right ventricle b) Left auricle c) Right auricle d) Left ventricle
94. Closed circulatory system occurs in _____
a) cockroach b) tadpole/fish c) mosquito d) house fly
95. Which of the following statements is true for lymph?
a) WBCs + serum b) Blood - RBCs and some proteins c) RBCs + WBCs + plasma
d) RBCs + proteins + platelets

96. Dup sound is produced during closure of _____.
a) semilunar valves b) bicuspid valve c) tricuspid valve d) Both (b) and (c)
97. Assertion: The process of clotting can occur in absence of all cellular elements except platelets
Reason: Vitamin K is essential for blood clotting
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
98. Coagulation will not be affected in the absence of factor
a) VII b) XII c) VIII d) VI
99. Reduction in pH of blood will _____.
a) reduce the rate of heart beat. b) reduce the blood supply to the brain.
c) decrease the affinity of hemoglobin with oxygen. d) release bicarbonate ions by the liver.
100. Which of the following statements is incorrect?
a) Erythrocytes/RBCs are the least abundant of all the cells in blood.
b) The number of RBCs in adult man per mm^3 of blood is 5 million to 5.5 million.
c) RBCs are formed in the red bone marrow in the adults.
d) RBCs are enucleated in most of the mammals.
101. Heart sound which is longer is
a) lub b) dup c) both equal d) sometimes (a) and sometimes (b).
102. Which of the following is the diagrammatic representation of standard electrocardiogram (ECG)?
- a)  b) 
- c)  d) 
103. RBCs do not occur in _____.
a) frog b) cow c) camel d) cockroach
104. In the clotting mechanism pathway, thrombin activates the factors
a) XI, VIII, V b) XI, IX, X c) VIII, X, V d) IX, VIII, X.
105. Lungs receive blood from right side of the heart, whereas the branching of systemic arteries result in a parallel pattern. What is the advantage of such of an arrangement
a)
It ensures that each of the peripheral organs and tissues receive only a fraction of blood pumped by the left ventricle.
b)
It allows for independent variation in blood flow through different tissues as their metabolic activities change
c)
It ensures that as blood flows through capillaries, some of the oxygen leaves the blood to enter cells.
d) Both (a) and (b)

106. What would be the cardiac output of a person having 72 heart beats per minute and a stroke volume of 50 mL?

- a) 360 mL b) 3600 mL c) 7200 mL d) 5000 mL

107. Identify the components labelled (A-D) in the given flow chart of the blood clotting process.



a)

A	B	C	D
Thromboplastin	Prothrombinase	Thrombin	Fibrinogen

b)

A	B	C	D
Fibrinogen	Thrombin	Prothrombinase	Thromboplastin

c)

A	B	C	D
Prothrombinase	Fibrinogen	Thromboplastin	Thrombin

d)

A	B	C	D
Thrombin	Thromboplastin	Fibrinogen	Prothrombinase

108. Doctors use stethoscope to hear the sounds produced during each cardiac cycle. The second sound is heard when ____

- a) Ventricular wall vibrate due to gushing in of blood from atria
 b) Semilunar valves close down after the blood flows into vessels from ventricles
 c) AV node receives signal from SA node d) AV valves open up

109. Read the following statements and select the correct option.

Statement 1: The SA node acts as pacemaker.

Statement 2: The SA node is located in the wall of the right atrium near the interatrial septum.

- a) Both statements 1 and 2 are correct b) Statement 1 is correct but statement 2 is incorrect
 c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect

110. Systemic heart refers to ____

- a) the two ventricles together in humans
 b) the heart that contracts under stimulation from nervous system
 c) left auricle and left ventricle in higher vertebrates d) entire heart in lower vertebrates

111. The cardiac impulse is initiated and conducted further upto ventricle. The correct sequence of conduction of impulse is

a)

SA Node	AV Node	Purkinje fibre	AV Bundle
---------	---------	----------------	-----------

b)

SA Node	Purkinje fibre	AV Node	AV Bundle
---------	----------------	---------	-----------

c)

SA Node	AV Node	AV Bundle	Purkinje fibre
---------	---------	-----------	----------------

d)


SA Node	Purkinje fibre	AV Bundle	AV Node
---------	----------------	-----------	---------

112. Match the types of WBC listed under column I with the shape of nucleus given under column II and select the correct option from codes given below.


Column-I		column-II
A Neutrophils	(i)	Kidney-shaped
B Eosinophils	(ii)	S-shaped
C Basophils	(iii)	3 to 5 lobes
D Monocytes	(iv)	2 lobes
	(v)	Disc-shaped

- a) A-(iii), B- (v), C-(i), D-(ii) b) A-(v), B-(iii), C-(i) D-(iv) c) A-(ii), B-(i), C-(v), D-(iii)
 d) A-(iii), B-(iv), C-(ii),D-(i)
113. Which of the following statements is correct regarding neural regulation of cardiac activity?
- a) The cardiac centre lies in medulla oblongata of brain
- b) Sympathetic nerve fibres accelerate the rate of heart beat and parasympathetic nerve fibres retard the rate of heart beat.
- c) Sensory fibres extend from the receptors present in the walls of aortic arch, carotid sinuses and vena cava to the cardiovascular centre in medulla oblongata
- d) All of these
114. Which of the following match is correct?


a)

Structure	Percentage	Function
	0.3 -0.5	Phagocytic


b)

Structure	Percentage	Function
	0.5 - 1.0	Secrete histamine and serotonin

c)

Structure	Percentage	Function
	30-40	Defence against parasites

d)

Structure	Percentage	Function
	30-40	Allergic reactions

115. Match the terms given under column 'A' with their functions given under column 'B' and select the answer from the options given below:

Column-I		Column-II
A Lymphatic system	(i)	Carries oxygenated blood
B Pulmonary vein	(ii)	Immune response
C Thrombocytes	(iii)	To drain back the tissue fluid to the circulatory system
D Lymphocytes	(iv)	Coagulation of blood

- a) A-ii, B-i, C-iii, D-iv b) A-iii, B-i, C-iv, D-ii c) A-iii, B-i, C-ii, D-iv d) A-ii, B-i, C-iii, D-iv
116. 'X' is the rhythmic contraction and relaxation in the aorta and its main arteries. What is X?
- a) Heartbeat b) Heart rate c) Pulse d) Cardiac output
117. Which one of the following is correct?
- a) Serum = Blood + Fibrinogen b) Lymph = plasma + RBC + WBC
 c) Blood = Plasma + RBC + WBC d) Plasma = Blood - Lymphocytes
118. pH of blood

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a) is greater than 9 b) ranges between 7-8 c) is less than 7 d) none of these

119. Match the items given in Column I with those in Column II and select the correct option given below

Column I	Column II
A. Fibrinogen	(i) Osmotic balance
B. Globulin	(ii) Blood clotting
C. Albumin	(iii) Defence mechanism

a) (i),(iii),(ii) b) (i),(ii),(iii) c) (iii),(ii),(i) d) (ii),(iii),(i)

120. Which one of the following is incorrect for 'atherosclerosis'?

- a) Constriction of arterial lumen reduces the blood flow
- b) Loss of dilation ability of the arterial wall and its rupture
- c) Cholesterol deposition at the inner wall of the artery d) None of these

121. Consider the following four statements (i) - (iv) and select the correct option.

- (i) SA node is natural pacemaker of heart.
- (ii) Human heart has inter-auricular foramen.
- (iii) Right atrioventricular valve is a semilunar valve.
- (iv) Normal systolic and diastolic pressure of humans is 120 and 60 mm Hg respectively.

a)	b)	c)	d)
(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)	(i)(ii)(iii)(iv)
F F T F	F F T T	T T F T	T F F F

122. Which type of white blood cells are concerned with the release of histamine and the natural anti-coagulant heparin?

- a) Neutrophils b) Basophils c) Eosinophils d) Monocytes

123. Which one of the following types of cells lack nucleus in humans?

- a) RBC b) Neutrophils c) Eosinophils d) Erythrocytes

124. In veins, valves are present to check backward flow of blood flowing at

- a) atmospheric pressure b) high pressure c) low pressure d) all of these.

125. Adult human RBCs are enucleate. Which of the following statement(s) is/are most appropriate explanation for this feature?

- (1) They do not need to reproduce
- (2) They are somatic cells
- (3) They do not metabolize
- (4) All their internal space is available for oxygen transport
- a) Only 4 b) Only 1 c) 1, 3 and 4 d) 2 and 3

126. Right atrium receives blood from

- a) pulmonary aorta b) pulmonary veins c) inferior vena cava
- d) superior and inferior vena cava.

127. Match column I with column II and select the correct option from the codes given below

Column-I	Column-II
A RBC	(i) Coagulation
B Antibody	(ii) Immunity
C Platelets	(iii) Contraction
D Systole	(iv) Gas transport
	(v) Hypertension

- a) A - (v), B - (i), C - (iv), D - (iii) b) A - (ii), B - (iv), C - (iii), D - (i)
 c) A - (iv), B - (ii), C - (i), D - (iii) d) A - (iii), B - (v), C - (ii), D - (iv)

128. The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because "O" in it refers to having _____ .
 a) overdominance of this type on the genes for A and B types
 b) one antibody only - either anti -A or and - B on the RBC c) no antigens A and B on RBCs
 d) other antigens besides A and B on RBCs
129. Arteries carry oxygenated blood except _____
 a) pulmonary b) cardiac c) hepatic d) systemic
130. Heart pumps blood more forcefully in older persons than younger ones due to
 a) decrease in oxygen content of blood b) decrease in elasticity of arteries
 c) fall in nutrient content of blood d) increase in elasticity of arteries.
131. Blood enters the heart because muscles of the
 a) atrium contracts b) atrium relaxes c) ventricle relaxes d) ventricle contracts.
132. Examine the diagrammatic representation of standard ECG. Select an option with correct matching.



a)

P-wave	QRS complex	T-wave
Repolarisation of the atria	Repolarisation of the ventricles	Depolarisation of the atria

b)

P-wave	QRS-complex	T-wave
Depolarisation of the atria	Depolarization of ventricles	Repolarisation of the ventricles

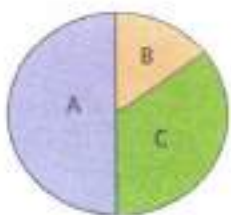
c)

P-wave	QRS complex	T-wave
Repolarisation of the ventricles	Repolarisation of the atria	Depolarization of ventricles

d)

P-wave	QRS complex	T-wave
Depolarization of ventricles	Depolarisation of the atria	Repolarisation of the atria

133. Assertion: The enlarged Q and R waves indicate myocardial infarction.
 Reason: Any deviation in the normal recording of ECG indicates possible abnormality or disease.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
134. Breakdown product of haemoglobin is _____
 a) bilirubin b) iron c) biliverdin d) calcium
135. The figure represents total period of one cardiac cycle i.e., 0.8 sec and A, B and C represent its stages. Identify A, B and C and select the correct statement regarding them.



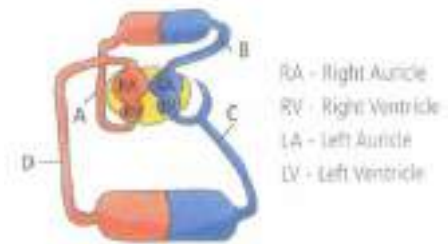
- a) During A, tricuspid and bicuspid valves open and blood flows from atria into the ventricles
 b) During B, bicuspid and tricuspid valves close producing first heart sound.

- c) During C. the semilunar valves close producing second heart sound.
d) During B, the atria contract due to a wave of contraction by SA node
136. Cardiac activity could be moderated by the autonomous neural system. Tick the correct answer
a) The parasympathetic system stimulates heart rate and stroke volume
b) The sympathetic system stimulates heart rate and stroke volume
c) The parasympathetic system decreases the heart rate but increase stroke volume.
d) The sympathetic system decreases the heart rate but increase stroke volume
137. Haemoglobin is a type of____
a) carbohydrate b) vitamin c) skin pigment d) respiratory pigment
138. Which one of the following has an open circulatory system?
a) Periplaneta b) Hirudinaria c) Octopus d) Pheretima
139. A vein possesses a large lumen because____
a) tunica media and tunica externa form a single coat
b) tunica intima and tunica media form a single coat
c) tunica interna, tunica media and tunica externa are thin d) tunica media is a thin coat
140. Assertion: Type 'O' blood group individuals are called 'universal donors'.
Reason: RBCs of 'O' blood group have both 'A' and 'B' surface antigens.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
141. Most of our cells are surrounded by
a) blood b) fluid equivalent to seawater in salt composition c) interstitial fluid d) pure water
142. The given figure shows an angiogram of the coronary blood vessel. Which one of the following statements correctly describes, what is being done?



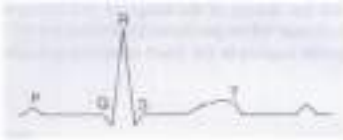
- a) It is a coronary artery which has a cancerous growth that is being removed.
b) It is a coronary artery which is blocked by a plaque and the same is being cracked
c) It is a coronary vein in which the defective valves are being opened.
d) It is a coronary vein blocked by a parasite (blood fluke) that is being removed.
143. Which proteolytic enzyme induces lysis of fibrin during fibrinolysis?
a) Fibrin b) Thrombin c) Plasmin d) Platelet factor VIII
144. **Assertion:** RBCs are devoid of nucleus in most of the mammals
Reason : Entire cytoplasm of RBCs is filled with red coloured, iron containing complex protein called haemoglobin
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is assertion and but reason is false. d) If both assertion and reason are false.
145. In humans, blood passes from the post caval to the diastolic right atrium of heart due to _____.

- a) pushing open of the venous valves b) suction pull c) stimulation of the sino auricular node
d) pressure difference between the post caval and atrium
146. Which of the following statements is correct regarding veins?
a) Carry blood from an organ towards the heart
b) All veins carry oxygenated blood with single exception
c) Carry blood from heart towards the organ d) All of these
147. In mammals, histamine is secreted by _____
a) fibroblasts b) histocytes c) lymphocytes d) mast cells
148. In the figure given below, which blood vessel represents vena cava?



- a) C b) D c) A d) B
149. In which of the following points pulmonary artery is different from pulmonary vein?
a) Its lumen is broad b) Its wall is thick. c) It has valves. d) It does not possess endothelium
150. Read the following statements and select the correct option
Statement 1: Lymphatic capillaries are free and blind at one end
Statement 2: Lymph does not flow in a circular manner
a) Both statements 1 and 2 are correct b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect
151. The cardiac pacemaker in a patient fails to function normally. The doctors find that an artificial pacemaker is to be grafted in him. It is likely that it will be grafted at the site of _____
a) Atrioventricular bundle b) Purkinje system c) Sinuatrial node d) Atrioventricular node
152. Assertion : There is no mixing of oxygenated and deoxygenated blood in the human heart.
Reason: Valves are present in the heart which allows the movement of blood in one direction only
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false
153. What is correct for blood group 'O'?
a) No antigens but both a and b antibodies are present b) A antigen and b antibody
c) Antigen and antibody both absent d) A and B antigens and a, b antibodies
154. The life span of human granulocytic WBC is approximately
a) between 2 to 3 months b) more than 4 months c) less than 10 days
d) between 20 to 30 days.
155. Compared to blood our lymph has _____ .
a) plasma without proteins b) more WBCs and no RBCs c) more RBCs and less WBCs
d) no plasma

156. The diagram given here is the standard ECG of a normal person. The P-wave represents the :



- a) Contraction of both atria b) Initiation of the ventricular contraction
c) Beginning of the systole d) End of the systole

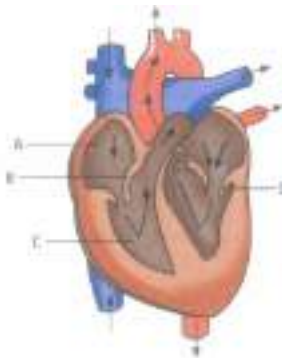
157. What is true about RBCs in humans?

- a) They carry about 20-25 per cent of CO_2 b) They transport 99.5 per cent of O_2
c)

They transport about 80 per cent oxygen only and the rest 20 per cent of it is transported in dissolved state in blood plasma

- d) They do not carry CO_2 at all

158. The given figure illustrates a section through the human heart.



Which labelled part represents the site for the generation of action potential in human heart?

- a) A b) B c) C d) D

159. The most active phagocytic white blood cells are:

- a) Neutrophils and monocytes b) Neutrophils and eosinophils
c) Lymphocytes and macrophages d) Eosinophils and lymphocytes

160. Lymph nodes form

- a) hormones b) lymph c) antigens d) antibodies

161. Which one of the following plasma proteins is involved in the coagulation of blood?

- a) Albumin b) Serum amylase c) Globulin d) Fibrinogen

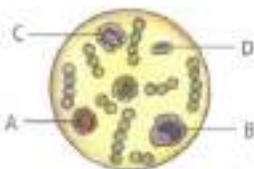
162. Which of the following is an agranulocyte?

- a) Basophil b) Neutrophil c) Lymphocyte d) Eosinophil

163. Which of the following options represents correct systemic circulation in human being?

- a) Left ventricle $\xrightarrow[\text{Blood}]{\text{Deoxygenated}}$ Tissues $\xrightarrow[\text{Blood}]{\text{Oxygenated}}$ Right ventricle
b) Right ventricle $\xrightarrow[\text{Blood}]{\text{Oxygenated}}$ Tissues $\xrightarrow[\text{Blood}]{\text{Deoxygenated}}$ Right auricle
c) Left ventricle $\xrightarrow[\text{Blood}]{\text{Deoxygenated}}$ Tissues $\xrightarrow[\text{Blood}]{\text{Oxygenated}}$ Right auricle
d) Left ventricle $\xrightarrow[\text{Blood}]{\text{Oxygenated}}$ Tissues $\xrightarrow[\text{Blood}]{\text{Deoxygenated}}$ Right auricle

164. Study the given figure and identify the cells labelled as A, B, C and D.

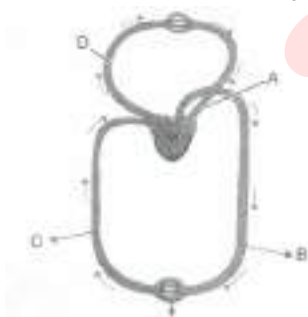


- a) A - Eosinophil, B - Erythrocyte, C - Neutrophil, D - Basophil
 b) A - Eosinophil, B - Lymphocyte, C - Neutrophil, D - Monocyte
 c) A - Erythrocyte, B - Basophil, C - Neutrophil, D - Lymphocyte
 d) A - Eosinophil, B - Monocyte, C - Neutrophil, D - Lymphocyte

165. Match the Column-I with Column - II

Column-I	Column-II
A. P-wave	(i) Depolarisation of ventricles
B. QRS complex	(ii) Repolarisation of ventricles
C. T - wave	(iii) Coronary ischemia
D. Reduction in the size of T- wave	(iv) Depolarisation of atria
	(v) Repolarisation of atria

- a) (iv),(i),(ii),(v) b) (ii),(i),(v),(iii) c) (ii),(iii),(v),(iv) d) (iv),(i),(ii),(iii)
166. How do parasympathetic neural signals affect the working of the heart?
 a) Reduce both heart rate and cardiac output
 b) Heart rate is increased without affecting the cardiac output
 c) Both heart rate and cardiac output increase
 d) Heart rate decreases but cardiac output increases
167. Which statement is true for WBC?
 a) Non-nucleated b) Its deficiency causes cancer c) Manufactured only in thymus
 d) Can squeeze through blood capillaries
168. Chordae tendineae are found in
 a) ventricles of brain b) joints of legs c) ventricles of heart d) atria of heart
169. What would be the heart rate of a person if the cardiac output is 5 L, blood volume in the ventricles at the end of diastole is 100 ml- and at the end of ventricular systole is 50 ml _____ .
 a) 75 beats per minute b) 100 beats per minute c) 125 beats per minute
 d) 50 beats per minute
170. The figure shows the schematic plan of blood circulation in humans with labels A, B, C and D. Choose the correct option labelled with its functions.



- a) A - pulmonary vein - takes impure blood from body parts, $pO_2 = 60$ mm Hg
 b) B- pulmonary artery - takes blood from heart to lungs, $pO_2 = 90$ mm Hg
 c) C - vena cava - takes blood from body parts to right auricle, $pCO_2 = 45$ mm Hg
 d) D - dorsal aorta - takes blood from heart to body parts, $pO_2 = 95$ mm Hg
171. Which is the principal cation in the plasma of the blood?
 a) Magnesium b) Sodium c) Potassium d) Calcium
172. Which of the following statements is/are incorrect about lymph?
 (i) Lymph is colourful as it has haemoglobin but no RBC.
 (ii) It contains specialised lymphocytes which are responsible for immunity of the body.

(iii) Lymph is an important carrier for nutrients and hormones.

(iv) Fats are absorbed through lymph in the lacteals present in the intestinal villi.

a) (i) only b) (iii) and (iv) c) (ii) and (iii) d) (iv) only

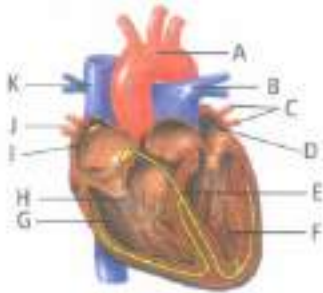
173. If due to some injury the chordae tendineae of the tricuspid valve of the human heart is partially nonfunctional, what will be the immediate effect?

a) The flow of blood into the aorta will be slowed down b) The 'pacemaker' will stop working.

c) The blood will tend to flow back into the left atrium.

d) The flow of blood into the pulmonary artery will be reduced

174. The given figure shows the vertical section of human heart. Identify the parts labelled as A to K



a)

A-Aorta, B-Pulmonary vein, C-Pulmonary arteries, D-Left ventricle, E-Semilunar valves, F-Left auricle, G-Right auricle, H-Superior vena cava, I-Right ventricle, J-Tricuspid valves, K-Inferior vena cava

b)

A-Aorta, B-Pulmonary artery, C-Pulmonary veins, D-Left auricle, E-Bundle of His, F-Left ventricle, G-Right ventricle, H-Chordae tendineae, I-Right auricle, J-Sino-atrial node, K - Vena cava

c)

A-Aorta, B-Superior vena cava, C-Inferior vena cava, D-Right ventricle, E-Bundle of His, F-Right auricle, G-Left auricle, H-Pulmonary vein, I-Right ventricle, J-Sino-atrial node, K-Pulmonary artery

d)

A-Aorta, B-Superior vena cava, C-Inferior vena cava, D-Left ventricle, E-Semilunar valves, F-Left auricle, G-Right auricle, H-Pulmonary artery, I-Right ventricle, J-Tricuspid valves, K-Pulmonary vein

175. Assertion: Sino-atrial node (SAN) is called the pacemaker.

Reason: SAN generates the maximum number of action potentials and is responsible for initiating and maintaining the rhythmic contractions of the heart.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

176. The problem of electrical discontinuity caused in the normal heart by the connective tissue separating the atria from the ventricles is solved by

a)

coordinating electrical activity in the atria with electrical activity in the ventricles by connecting them via the bundle of His

b) having the A-V node function as a secondary pacemaker c) having an ectopic pacemaker

d)

coordinating electrical activity in the atria with electrical activity in the ventricles by connecting them via the vagus nerve

177. The lymph serves to _____

- a) transport oxygen to the brain b) transport carbon dioxide to the lungs
- c) return the interstitial fluid to the blood d) return the WBCs and RBCs to the lymph nodes

178. Blood pressure in the pulmonary artery is :

- a) More than that in carotid b) More than that in the pulmonary vein
- c) Less than that in the vena cava d) Same as that in aorta

179. Match column I with column II and select the correct option from the codes given below.

Column-I		Column-II
A Superior vena cava	(i)	Carries deoxygenated blood to lungs
B Inferior vena cava	(ii)	Carries oxygenated blood from lungs
C Pulmonary artery	(iii)	Brings deoxygenated blood from lower part of body to right atrium
D Pulmonary vein	(iv)	Bring deoxygenated blood from upper part of body to right atrium

- a) A - (ii), B - (iv), C - (iii), D - (i) b) A - (iv), B - (i), C - (ii), D - (iii)
- c) A - (iv), B - (iii), C - (i), D - (ii) d) A - (iv), B - (i), C - (iii), D - (ii)

180. People who have migrated from the plains to an area adjoining Rohtang Pass about six months back.

- a) Have more RBCs and their haemoglobin has a lower binding affinity to oxygen
- b) Are not physically fit to play games like football
- c) Suffer from altitude sickness with symptoms like nausea, fatigue etc.
- d) Have the usual RBC count but their haemoglobin has very high binding affinity to oxygen

181. Which of the following substances, if introduced into the blood stream, would cause coagulation of blood at the site of its introduction?

- a) Prothrombin b) Fibrinogen c) Thromboplastin d) Heparin

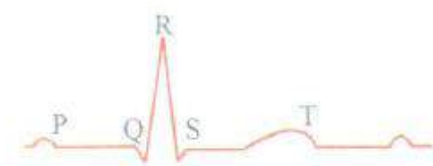
182. Which of the following statements are correct?

- (i) Ca^{+2} is necessary for blood coagulation
 - (ii) Coagulation in blood vessel is prevented during normal condition by heparin
 - (iii) Clotting of blood involves changes of fibrinogen to fibrin by thrombin
 - (iv) Blood clotting involves cascading process involving a number of factors present always in the active form
- a) (i), (iii) and (iv) b) (ii) and (iv) c) (i), (ii) and (iii) d) (iii) and (iv)

183. The haemoglobin of a human foetus _____

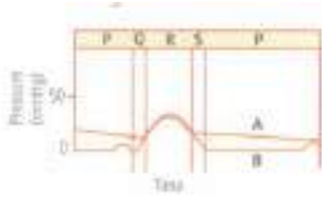
- a) has a lower affinity for oxygen than that of the adult
- b) its affinity for oxygen is the same as that of an adult
- c) has only 2 protein subunits instead of 4
- d) has a higher affinity for oxygen than that of an adult

184. The given figure is the ECG of a normal human. Which one of its components is correctly interpreted below?



- a) Complex QRS - one complete pulse b) Peak T - initiation of total cardiac contraction
- c) Peak P and peak R together - systolic and diastolic blood pressures
- d) Peak P - initiation of left atrial contraction only

185. Refer to the given figure in which A refers to pulmonary artery pressure and B refers to right ventricular pressure. Identify P, Q, R and S in the figure and match with the list (i - iv) given below. (i) Isovolumetric ventricular contraction (ii) Ventricular ejection (iii) Isovolumetric ventricular relaxation (iv) Ventricular filling



- a) P-(iv), Q-(iii), R-(ii), S-(i) b) P-(ii), Q-(iii), R-(i), S-(iv) c) P-(iv), Q-(i), R-(ii), S-(iii)
d) P-(i), Q-(ii), R-(iii), S-(iv)
186. Prothrombin required for blood clotting is produced in
a) stomach b) liver c) spleen d) pancreas
187. Given below are four statements (i-iv) regarding human blood circulatory system
(i) Arteries are thick-walled and have narrow lumen as compared to veins.
(ii) Angina is acute chest pain when the blood circulation to the brain is reduced.
(iii) Persons with blood group AB can donate blood to any person with any blood group under ABO system.
(iv) Calcium ions play a very important role in blood clotting.
Which two of the above statements are correct?
a) (i) and (iv) b) (i) and (ii) c) (ii) and (iii) d) (iii) and (iv)
188. A red blood cell, entering the right side of the
- a) Left ventricle $\xrightarrow{\text{Deoxygenated blood}}$ Tissues $\xrightarrow{\text{oxygenated blood}}$ Right ventricle
- b) Right ventricle $\xrightarrow{\text{Deoxygenated blood}}$ Tissues $\xrightarrow{\text{oxygenated blood}}$ Right ventricle
- c) Left ventricle $\xrightarrow{\text{Deoxygenated blood}}$ Tissues $\xrightarrow{\text{oxygenated blood}}$ Right auricle
- d) Left ventricle $\xrightarrow{\text{Deoxygenated blood}}$ Tissues $\xrightarrow{\text{oxygenated blood}}$ Right auricle
189. Rh factor was discovered by
a) Landsteiner and Weiner b) William Harvey c) Malpighi d) none of these
190. A drop of each of the following, is placed separately on four slides. Which of them will not coagulate?
a) Blood serum b) Blood from pulmonary artery c) Whole blood from pulmonary vein
d) Blood plasma
191. Which one of the following is a matching pair?
a) Lub - sharp closure of AV valves at the beginning of ventricular systole
b) Dup - sudden opening of semilunar valves at the beginning of ventricular diastole
c) Pulsation of the radial artery - valves in the blood vessels
d) Initiation of the heart beat - Purkinje fibres
192. Conversion of fibrinogen to fibrin is catalysed by
a) thrombin b) prothrombin c) thromboplastin d) all of these.
193. Child death may occur in the marriage of _____ .
a) Rh⁻ man and Rh⁺ woman b) Rh⁺ man and Rh⁺ woman c) Rh⁺ man and Rh⁻ woman
d) Rh⁻ man and Rh⁻ woman

194. The thickening of walls of arteries is called_____
- a) arthritis b) atherosclerosis c) anaeurysm d) Both (a) and (c)
195. Rate of heartbeat is determined by
- a) Purkinje fibres b) papillary muscles c) AV-node d) SA-node.
196. Which of the following is correct about human heart?
- a) The volume of both atria > the volume of both ventricles
- b) The volume of both ventricles > the volume of both atria
- c) The volume of both atria = the volume of both ventricles
- d) Ventricles are upper chambers and atria are lower chambers in our heart
197. In the following table of human ABO blood groups, fill up the blanks (i), (ii), (iii) and (iv) from the options given below.

Blood Group	Antigens on RBC's	Antibody in plasma	Donar groups
A	A	Anti-B	A,O
B	B	Anti-A	B,O
AB	AB	(ii)	A,B,AB,O
O	(i)	(iii)	(iv)

a)	b)	c)	d)
(i) (ii) (iii) (iv)	(i) (ii) (iii) (iv)	(i) (ii) (iii) (iv)	(i) (ii) (iii) (iv)
Nil Nil Nil O	Nil Nil Anti-A, BAB	Nil Anti-A, B Nil O	Nil Nil Anti-A, BO

198. The figure given below shows three stages in the cardiac cycle.



Which of the following sequences is correct regarding this?

- a) 2,3,1 b) 1,2,3 c) 2,1,3 d) 3,1,2
199. Cells formed in bone marrow include_____
- a) RBC b) RBC and leucocytes c) Leucocytes d) Lymphocytes
200. In which of the following situations, there is a risk factor for children acquiring erythroblastosis foetalis?
- a) Mother is Rh -ve and father is Rh -ve. b) Mother is Rh -ve and father is Rh +ve.
- c) Mother is Rh +ve and father is Rh +v d) Mother is Rh +ve and father is Rh -ve.
201. All veins carry deoxygenated blood except
- a) pulmonary vein b) hepatic vein c) hepatic portal vein d) renal vein.
202. The blood cancer is known as_____
- a) leukemia b) thrombosis c) haemolysis d) haemophilia
203. Consider the following four statements (i) - (iv) and select the correct option.
- (i) Fish heart contains only oxygenated blood.
- (ii) Closure of A-V valves produces the second heart sound
- (iii) The vascular connection between the digestive tract and kidney is called hepatic portal system.
- (iv) Purkinje fibres are nerve fibres present in the heart wall.

a)	b)	c)	d)
(i) (ii) (iii) (iv)	(i) (ii) (iii) (iv)	(i) (ii) (iii) (iv)	(i) (ii) (iii) (iv)
F F T F	F F F T	T T F T	T F T F

204. There is no DNA in _____
a) mature RBCs b) a mature spermatozoan c) hair root d) an enucleated ovum
205. In a standard ECG which one of the following alphabets is the correct representation of the respective activity of the human heart?
a) S - start of systole b) T - end of diastole c) P - depolarisation of the atria
d) R - repolarisation of ventricles
206. Find the correct descending order of percentage proportion of leucocytes in human blood
a) Neutrophils → Basophils → Lymphocytes → Acidophils (Eosinophils) → Monocytes
b) Monocytes → Neutrophils → Lymphocytes → Acidophils → Basophils
c) Neutrophils → Lymphocytes → Monocytes → Acidophils → Basophils
d) Lymphocytes → Acidophils → Basophils → Neutrophils → Monocytes
207. Name the blood cells whose reduction in number can cause clotting disorder leading to excessive loss of blood from the body.
a) Erythrocytes b) Leucocytes c) Neutrophils d) Thrombocytes
208. During the process of blood coagulation, vitamin K helps in
a) the formation of thromboplastin b) the conversion of fibrinogen to fibrin
c) the conversion of prothrombin to thrombin d) the formation of prothrombin.
209. Serum differs from blood in lacking:
a) Globulins b) Albumins c) Clotting factors d) Antibodies
210. Carotid artery supplies
a) oxygenated blood to lungs b) oxygenated blood to intestine c) oxygenated blood to brain
d) none of these.
211. ECG depicts the depolarisation and repolarisation processes during the cardiac cycle. In the ECG of a normal healthy individual one of the following waves is not represented.
a) Depolarisation of atria b) Repolarisation of atria c) Depolarisation of ventricles
d) Repolarisation of ventricles
212. Consider the following statements (A-C) each with one or two blanks.
(A) __ (i) __ are the most abundant cells (60-65 percent) of the total WBCs and ill are the least (0.5-1 percent) among them.
(B) Platelets are cell fragments produced from __ (3) __
(C) During clot formation, fibers are formed by the conversion of inactive __ (4) __ in the plasma by the enzyme __ (5) __
Which one of the following options, gives the correct fill ups for the respective blank numbers from (1) to (5) in the statements.
a) (1)-Neutrophils, (2)-basophils, (4)-fibrinogens, (5)-thrombin
b) (3)-mast cells, (4)-thrombokinese, (5)-prothrombin
c) (3)-megakaryocytes, (4)-prothrombin, (5)-thrombin
d) (1)-Basophils, (2)-neutrophils, (3)-reticulocytes
213. What happens when the pacemaker becomes nonfunctional?
a) Only auricles contract rhythmically b) Only ventricles contract rhythmically
c) Cardiac muscles do not undergo co-ordinated rhythmic movements
d) Auricles and ventricles contract rhythmically

214. Assertion: Closed circulatory system is less efficient than open circulatory system.

Reason: The blood flow is slow in closed circulatory system than in open circulatory system.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.

215. Match the items given in Column I with those in Column II and select the correct option given below:

Column I	Column II
(A) Tricuspid valve	(i) Between left atrium and left ventricle
(B) Bicuspid valve	(ii) Between right ventricle and pulmonary artery
(C) Semilunar valve	(iii) Between right atrium and right ventricle

a)

A	B	C
(i)	(ii)	(iii)

b)

A	B	C
(i)	(iii)	(ii)

c)

A	B	C
(iii)	(ii)	(i)

d)

A	B	C
(ii)	(iii)	(i)

216. Blood of AB group cannot be given to B group patient because

- a) patient has antibodies b) patient lacks antibodies c) patient lacks antibodies a
 d) patient has antibodies a

217. Excessively high heart rate (> 180) can reduce cardiac output because

- a) blood is moving too fast through the lungs to pick up enough oxygen
 b) it tires out the heart muscles and so they pump slower
 c) it reduces the time for ventricular filling which reduces stroke volume
 d)

the PR-interval increases which leads to longer ventricular diastole and shorter ventricular systole

218. Hormonal regulation of cardiac activity involves the hormones _____ and _____, secreted by the _____

- a) epinephrine, norepinephrine, cortex of adrenal glands
 b) epinephrine, norepinephrine, medulla of adrenal glands c) thyroxine, calcitonin, thyroid gland
 d) aldosterone, corticosterone, cortex of adrenal glands

219. Match column I with column II and select the correct option from the codes given below.

Column-I		Column-II
A Heart failure	(i)	Heart muscle is suddenly damaged by an inadequate blood supply
B Cardiac arrest	(ii)	Chest pain due to inadequate O_2 reaching the heart muscles
C Heart attack	(iii)	Atherosclerosis
D Coronary artery disease (CAD)	(iv)	Heart not pumping blood effectively enough to meet the needs of the body
E Angina pectoris	(v)	Heart stops beating

- a) A-(iv), B-(v), C-(i), D-(iii), E-(ii) b) A-(v), B-(iv), C-(i), D-(iii), E-(ii)
 c) A-(iv), B-(v), C-(i), D-(ii), E-(iii) d) A-(v), B-(iv), C-(ii), D-(iii), E-(i)

220. The QRS complex in a standard ECG represents _____.

- a) Depolarisation of ventricles b) Repolarisation of ventricles c) Repolarisation of auricles
 d) Depolarisation of auricles



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

EXCRETORY PRODUCT AND THEIR ELIMINATION 1

Marks : 880

- The excretory structure of amphioxus (cephalochordate) is
a) Flame cell/Solenocyte b) Coxal gland c) Malpighian tubules d) Green gland
- Uricotelic mode of passing out nitrogenous wastes is found in _____
a) Reptiles and Bird b) Birds and Annelids c) Amphibians and Reptiles
d) Insects and Amphibians
- The net pressure gradient that causes the fluid to filter out of the glomeruli into the capsule is _____.
a) 50 mm Hg b) 75 mm Hg c) 20 mm Hg d) 30 mm Hg
- Find out the incorrectly matching pair w.r.t the accessory excretory organs and the excretory wastes eliminated by them
a) Liver-Bilirubin, biliverdin and cholesterol b) Lungs-CO₂ and H₂O
c) Salivary gland-Heavy metals, drugs, small amounts of nitrogenous wastes
d) Sudorific gland-Sebum containing waxes, sterols and fatty acids
- Which of the following causes an increase in sodium reabsorption in the distal convoluted tubule?
a) Increase in aldosterone levels b) Increase in antidiuretic hormone levels
c) Decrease in aldosterone levels d) Decrease in antidiuretic hormone levels
- The ability of producing concentrated (hypertonic) urine in vertebrates generally depends on
a) area of Bowman's capsule epithelium b) length of the proximal convoluted tubule
c) length of Henle's loop d) capillary network forming glomerulus.
- Match the items given in Column I with those in Column II and select the correct option given below:

Column I (Function)	Column II (Part of Excretory system)
A. Ultrafiltration	(i) Henle's loop
B. Concentration of urine	(ii) Ureter
C. Transport of urine	(iii) Urinary bladder
D. Storage of urine	(iv) Malpighian corpuscle
	(v) Proximal Convoluted tubule

a)

A	B	C	D
(v)	(iv)	(i)	(ii)

b)

A	B	C	D
(iv)	(i)	(ii)	(iii)

c)

A	B	C	D
(iv)	(v)	(ii)	(iii)

d)

A	B	C	D
(v)	(iv)	(i)	(iii)

8. Match the terms given in column I with their physiological processes given in column II and choose the correct answer.

Column I	Column II
A. Proximal convoluted tubule	(i) Formation of concentrated urine
B. Distal convoluted tubule	(ii) Filtration of blood
C. Henle's loop	(iii) Reabsorption of 70-80% of electrolytes
D. Counter current mechanism	(iv) Ionic balance
E. Renal corpuscle	(v) Maintenance of concentration gradient in medulla

- a) A-(iii), B-(v), C-(iv), D-(ii), E-(i) b) A-(iii), B-(iv), C-(i), D-(v), E-(ii)
c) A-(i), B-(iii), C-(ii), D-(v), E-(iv) d) A-(iii), B-(i), C-(iv), D-(v), E-(ii)
9. Dialysis fluid contain all the constituents as in plasma, except _____.
a) Glucose b) NaCl c) Amino acids d) Urea
10. On an average, _____ ml of blood is filtered by the kidneys per minute which constitute roughly _____ of the blood pumped out by each ventricle of the heart in a minute.
a) 500-600, 1/5th b) 1100-1200, 1/3rd c) 500-600, 1/3rd d) 1100-1200, 1/5th
11. What is the osmolarity of the filtrate at the hairpin bend of loop of Henle?
a) 300 mOsmL⁻¹ b) 1200 mOsmL⁻¹ c) 600 mOsmL⁻¹ d) 800 mOsmL⁻¹
12. Which one of the following characteristics is common to both humans and adult frogs?
a) Nucleated RBCs b) Ureotelic mode of excretion c) Four chambered heart
d) Internal fertilization
13. Which of the following will lead to an increase in glomerular fluid filtration in the kidneys?
a) An increase in the protein concentration in the plasma
b) An increase in the fluid pressure in Bowman's space
c) An increase in the glomerular capillary blood pressure
d) A decrease in the glomerular capillary blood pressure
14. The parts of nephron situated in cortical region of kidney are
a) Loop of Henle, PCT and collecting duct
b) Collecting duct PCT and malpighian corpuscle c) PCT, DCT and Loop of Henle
d) PCT, DCT and malpighian corpuscle
15. The opening of urinary bladder is guarded by two urethral sphincter, Which one is involuntary in function
a) Internal sphincter b) External sphincter c) Both the sphincters
d) Both the sphincters are voluntary
16. Read the given statements regarding human excretory system and select the correct ones.
(i) Presence of glucose in urine is known as uremia.
(ii) Distal convoluted tubule (DCT) selectively secretes hydrogen ions, ammonia and potassium ions into the filtrate.
(iii) Macula densa is formed by cellular modifications in the distal convoluted tubule and the

efferent arteriole at their contact location.

(iv) Atrial natriuretic factor (ANF) can cause vasoconstriction when blood flow is low to the atria of the heart.

a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (iii) and (iv)

17. Long ducts of collecting tubules extend from

a) cortex to inner part of medulla b) medulla to outer cortex c) medulla to inner cortex
d) cortex to outer part of medulla.

18. Which of the following is the correct sequence of processes involved in urine formation?

a) Secretion, Reabsorption, Filtration b) Filtration, Reabsorption, Secretion
c) Reabsorption, Filtration, Secretion d) Reabsorption, Secretion, Filtration

19. Select the true statement

a) In fishes kidney play a major role in ammonia

b) Ammonia is 100,000 times less toxic urea

c)

Sharks retain a large amount of urea in the blood as a major osmolyte to balance the osmolarity of the body fluids

d) Most terrestrial reptile excrete ammonia

20. Which of the following is an incorrect match?

a) Bowman's capsule - Glomerular filtration b) DCT - Absorption of glucose

c) Henle's loop - Concentration of urine d) PCT - Absorption of Na^+ and K^+ ions

21. Uric acid is the chief nitrogenous component of the excretory products of _____

a) earthworm b) cockroach c) frog d) man

22. **Assertion:** The Henle's loop and vasa recta play a significant role in producing a concentrated urine.

Reason: The counter current arrangement of Henle's loop and vasa recta helps in this.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

23. Consider the following statements each with one or two blanks.

(i) Towards the centre of the inner concave surface of the kidney is a notch called (1) through which ureters, blood vessels and nerves enter.

(ii) The medulla of kidney is divided into a few conical masses called (2) projecting into the (3).

(iii) Glomerulus is a tuft of capillaries formed by the (4) artery. Blood from the glomerulus is carried away by (5) artery.

Which one of the following options correctly fills the blanks in any two of the statements?

a) (1) -renal pelvis, (2)-calyces, (3)-medullary pyramids

b) (2)-medullary pyramids, (3)-calyces, (4)-afferent, (5)-efferent

c) (2)-columns of Bertin, (3)-chordae tendinae, (4)-efferent, (5)-afferent

d) (1)-hilum, (4)-efferent, (5)-afferent

24. Mark the incorrect statement :

- a) Micturition is carried out by a reflex
b) ADH helps in H_2O elimination, making the urine hypotonic
c) Protein-free fluid is filtered from blood plasma into the Bowman's capsule
d) Glucose is actively reabsorbed in the PCT
25. The most advanced kidneys in which loop of Henle is present are called metanephric kidneys, these are found in all, except one
a) Amphibians b) Reptiles c) Birds d) Mammals
26. Malpighian body renal corpuscle is
a) Glomerulus along with collecting duct b) Glomerulus along with DCT
c) Glomerulus along with Bowman's capsule d) Glomerulus along with Loop of Henle
27. Juxtaglomerular apparatus is made up of
a) juxtaglomerular cells, macula densa and lacis cells
b) juxtaglomerular cells, Purkinje cells and chief cells
c) juxtaglomerular cells, lacis cells and myoepithelial cells
d) juxtaglomerular cells, macula densa and argentaffin cells
28. Columns of Bertin in the kidneys of mammals are formed as extensions of
a) cortex in medulla b) cortex in pelvis c) medulla in pelvis d) pelvis in ureter.
29. The bunch of capillaries present in the Bowman's capsule is called
a) Pacinian corpuscle b) Bowman's fibres c) glomerulus d) Malpighian corpuscle.
30. The part through which arteries and veins enter or leave the kidney is called
a) Hilus b) Renal papilla c) Major calyces d) Minor calyces
31. Which of the following cannot be considered as part of structure of uriniferous tubule?
a) Bowman's capsule b) Convolted tubule c) Henle's loop d) Collecting duct
32. Almost all the aquatic animals excrete ammonia as the nitrogenous waste product. Which of the following statements is not in agreement with this situation?
a) Ammonia is easily soluble in water.
b) Ammonia is released from the body in a gaseous state.
c) Ammonia is highly toxic and needs to be eliminated when formed. d) Both (a) and (b).
33. Liquid which collects in the cavity of Bowman's capsule is
a) concentrated urine b) plasma minus blood proteins and blood cells
c) glycogen and water d) sulphates and water
34. Which one of the following statements in regard to the excretion by the human kidneys is correct?
a) Descending limb of Loop of Henle is impermeable to water
b) Distal convoluted tubule is incapable of reabsorbing HCO_3
c) Nearly 99 per cent of the glomerular filtrate is reabsorbed by the renal tubules
d) Ascending limb of Loop of Henle is impermeable to electrolytes
35. Match column I with column II and select the correct option from the codes given below.

Column I	Column II

A. Nephridia	(i) Crustaceans
B. Malpighian tubules	(ii) Annelids
C. Antennal gland or Green glands	(iii) Insects

a) A-(i), B-(ii), C-(iii) b) A-(iii), B-(ii), C-(i) c) A-(ii), B-(iii), C-(i) d) A-(ii), B-(i) C-(iii)

36. Which one of the following statements is correct with respect to kidney function regulation?

- a) When someone drinks lot of water ADH release is suppressed
- b) Exposure to cold temperature blood flow stimulates formation of Angiotensin II
- c) An increase in glomerular blood flow stimulates formation of Angiotensin II
- d)

During summer when body loses lot of water by evaporation, the release of ADH is suppressed

37. All Bowman's capsules of the kidney are found in

- a) cortex b) pelvis c) medulla d) none of these.

38. Use of an artificial kidney during hemodialysis may result in

- (A) Nitrogenous waste build-up in the body.
- (B) Non-elimination of excess potassium ions.
- (C) Reduced absorption of calcium ions from gastro intestinal tract.
- (D) Reduced RBC production.

Which of the following options is the most appropriate?

- a) (B) and (C) are correct b) (C) and (D) are correct c) (A) and (D) are correct
- d) (A) and (B) are correct

39. Which one of the following is also known as antidiuretic hormone?

- a) Oxytocin b) Vasopressin c) Adrenaline d) Calcitonin

40. Which of the following sequences is correct regarding regulation of kidney function?

a)

An excess loss of water from body → Hypothalamus → Osmoreceptors
→ Neurohypophysis → ADH → Increases water permeability of DCT and CT
→ Prevention of diuresis

b)

An excess loss of fluid from body → Osmoreceptors → Hypothalamus → Neurohypophysis
→ ADH → Increases water permeability of DCT and CT → Prevention of diuresis

c)

An excess loss of fluid from body → Osmoreceptors → Hypothalamus → Neurohypophysis
→ Aldosterone → Water permeability of DCT and CT increases → Prevention of diuresis

d)

An excess loss of fluid from body → Osmoreceptors → Hypothalamus → Adenohypophysis
→ ADH → Increases water permeability of DCT and CT → Prevention of diuresis

41. Proximal convoluted tubule is highly specialized for reabsorption of substances. It is lined by

- a) Simple squamous epithelium b) Simple columnar epithelium
- c) Simple cuboidal epithelium without microvilli d) Simple cuboidal epithelium with microvilli

42. The cause of glomerular filtration is

- a) Osmosis b) GHP c) Hemodialysis d) Acidic pH

43. Find out incorrect statement W.r.t the human kidney
a) Left is little higher than the right one b) Retroperitoneal in position
c) Contains two million neurons each d) Located in abdomen at the level of T₁₂ to L₃
44. The dotted appearance of cortex of kidney is due to
a) ducts of Bellini b) convoluted parts c) loop of Henle d) collecting tubes.
45. as compared to plasma, all are the constituents of dialysis fluid, except
a) NaCl b) Glucose c) Aminoacid d) Urea
46. An adult human excretes, on an average _____ litres of urine per day.
a) 1 to 1.5 b) 2 to 2.5 c) 2.5 to 3 d) 3 to 3.5
47. Blood which leaves liver and passes towards heart has higher concentration of
a) Bile b) Oxygen c) RBCs d) Urea
48. A fall in glomerular filtration rate (GFR) activates
a) juxtaglomerular cells to release renin b) adrenal cortex to release aldosterone
c) adrenal medulla to release adrenaline d) posterior pituitary to release vasopressin.
49. Which of the following structure helps in excretion and conservation of water in terrestrial arthropods?
a) Malpighian body b) Antennary gland c) Malpighian tubules d) Keber's organs
50. In which segment of the nephron, reabsorption is minimum?
a) Proximal convoluted tubule (PCT) b) Distal convoluted tubule (DCT) c) Loop of Henle
d) Both (1) & (2)
51. If kidneys patient fail to reabsorb water, the effect on tissue would _____
a) remain unaffected b) shrink and shrivel c) absorb water from blood plasma
d) take more O₂ from blood
52. Glomerulonephritis is
a) inflammation of glomeruli of kidney b) inflammation of liver
c) presence of stone in glomeruli of kidney d) tumour in glomeruli of kidney.
53. **Assertion:** In the descending limb of loop of Henle the urine is hypotonic, while in ascending limb of loop of Henle, the urine is hypertonic.
Reason: Descending limb is impermeable to water while ascending limb is impermeable to Na⁺.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
54. Human urine is usually acidic because _____
a) excreted plasma proteins are acidic
b) potassium and sodium exchange generates acidity
c) hydrogen ions are actively secreted into the filtrate
d)
the sodium transporter exchanges one hydrogen ion for each sodium ion in peritubular capillaries

55. **Assertion:** Antidiuretic hormone (ADH) controls the amount of water in the urine.
Reason: ADH determines the permeability of the collecting duct to water.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
56. Reabsorption of H_2O from distal parts of the tubules is facilitated by hormone _____.
a) Vassopressin b) ADH c) Aldosterone d) Both (1) & (2)
57. Hippuric acid, creatinines and ketones are added to urine through
a) selective reabsorption b) glomerular filtration c) tubular secretion d) both (b) and (c).
58. In case of dehydration secretion of all hormones increases except one, make this except one:
a) Renin b) Aldosterone c) Vassopressin d) Renal stone
59. **Assertion:** Sharks are said to be ammonotelic animals.
Reason: Sharks can retain considerable amounts of ammonia in their blood.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
60. The longest loop of Henle is found in
a) kangaroo rat b) opossum c) rhesus monkey d) porcupine
61. The presence of glucose and ketone bodies in urine are indicative of
a) Diabetes mellitus b) Diabetes insipidus c) Renal calculi d) Glomerulonephritis
62. Which of the following is the most toxic excretory product?
a) CO_2 b) Ammonia c) Urea d) Amino acids
63. The following substances are the excretory products in animals. Choose the least toxic from among them.
a) Urea b) Uric acid c) Ammonia d) Carbon dioxide
64. **Assertion:** During micturition, urine is prevented from flowing back into the ureters.
Reason: Urethral sphincters contract during micturition.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
65. The basic functional unit of human kidney is ____
a) nephron b) pyramid c) nephridia d) Henle's loop
66. Which of the following groups contains uricotelic animals only?
a) Reptiles, birds, land snails, insects b) Reptiles, birds, land snails, aquatic insects
c) Amphibians, birds, land snails, insects d) Amphibians, reptiles, birds, insects
67. Osmotic concentration of glomerular filtrate is the highest at the bottom of the U-shaped Henle's loop. It is about _____ $mos\ mL^{-1}$.

a) 300 b) 600 c) 900 d) 1200

68. Glucose is taken back from glomerular filtrate through____
 a) active transport b) passive transport c) osmosis d) diffusion
69. Some animals convert highly toxic NH_3 into toxic trimethylamine oxide (TMAO) and retain high concentration of TMAO and urea to minimise H_2O loss from body are:
 a) Sharks and rays b) Fresh water bony fishes c) Myxine d) Marine bony fishes
70. Consider the following four statements (i) - (iv) and select the option that correctly identifies the true (T) and false (F) ones.
 (i) Micturition is carried out by a reflex.
 (ii) ADH helps in water elimination making the urine hypotonic.
 (iii) Protein-free fluid is filtered from blood plasma into the Bowman's capsule.
 (iv) Glucose is actively reabsorbed in the proximal convoluted tubule
- a)

(i)	(ii)	(iii)	(iv)
T	F	T	T

 b)

(i)	(ii)	(iii)	(iv)
T	T	F	F

 c)

(i)	(ii)	(iii)	(iv)
F	F	F	T

 d)

(i)	(ii)	(iii)	(iv)
F	T	F	T
71. Mark the inappropriate term w.r.t the glomerular filtration
 a) Non selective b) Passive process c) Active process
 d) Occurs due to pressure difference
72. Brush border is characteristic of____
 a) neck of nephron b) collecting tube c) proximal convoluted tubule d) All of the above
73. The principal nitrogenous excretory compound in humans is synthesised____
 a) in kidneys but eliminated mostly through liver
 b) in kidneys as well as eliminated by kidneys
 c) in liver and also eliminated by the same through bile
 d) in the liver, but eliminated mostly through kidneys
74. Excretion of potassium is governed primarily by
 a) potassium reabsorption in proximal convoluted tubule
 b) potassium secretion in proximal convoluted tubule
 c) potassium secretion in distal convoluted tubule
 d) potassium reabsorption in distal convoluted tubule.
75. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Uremia	(i) Ketone bodies in urine
B. Ketonuria	(ii) Artificial kidney
C. Glycosuria	(iii) Glucose in urine
D. Blood dialyser	(iv) Accumulation of urea in blood

a)	b)	c)	d)																																
<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iii)</td><td>(iv)</td><td>(i)</td><td>(ii)</td></tr></table>	A	B	C	D	(iii)	(iv)	(i)	(ii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iv)</td><td>(i)</td><td>(iii)</td><td>(ii)</td></tr></table>	A	B	C	D	(iv)	(i)	(iii)	(ii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(i)</td><td>(iv)</td><td>(ii)</td><td>(iii)</td></tr></table>	A	B	C	D	(i)	(iv)	(ii)	(iii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(ii)</td><td>(i)</td><td>(iv)</td><td>(iii)</td></tr></table>	A	B	C	D	(ii)	(i)	(iv)	(iii)
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(i)	(iv)	(ii)	(iii)																																
A	B	C	D																																
(ii)	(i)	(iv)	(iii)																																

76. Which one of the following organisms is correctly matched with its excretory organs?

- a) Humans - Kidneys, sebaceous glands and tear glands
- b) Earthworm - Pharyngeal, integumentary and septal nephridia
- c) Cockroach - Malpighian tubules and enteric caeca
- d) Frog - Kidneys, skin and buccal epithelium

77. Select the correct option representing the parts of nephron that respectively absorb (i) glucose, (ii) amino acids, (iii) inorganic ions (Na^+ , K^+ , Cl^-) and (iv) urea in maximum.

a)

(i)	(ii)	(iii)	(iv)
DCT	Descending limb of loop of Henle	DCT	DCT

b)

(i)	(ii)	(iii)	(iv)
DCT	Descending limb of loop of Henle	PCT	DCT

c)

(i)	(ii)	(iii)	(iv)
PCT	PCT	PCT	Ascending limb of loop of Henle

d)

(i)	(ii)	(iii)	(iv)
PCT	DCT	DCT	Ascending limb of loop of Henle

78. Vasa recta is

- a) L-shaped b) U-shaped c) S-shaped d) V-shaped

79. Which one of the following is correct for a normal human?

- a) pH of urine is around 8.
- b) On an average, 75-80 mg of urea is excreted via urine per day.
- c) Presence of ketone bodies in urine is an indicator of diabetes mellitus.
- d) Relaxation of smooth muscles of bladder and simultaneous contraction of urethral sphincter causes release of urine.

80. A decrease in blood pressure/volume will not cause the release of:

- a) Renin b) Atrial Natriuretic Factor c) Aldosterone d) ADH

81. A Malpighian body is constituted by

- a) glomerulus only b) glomerulus and Bowman's capsule
- c) glomerulus and efferent vessel d) glomerulus, Bowman's capsule and efferent vessel

82. Which of the following is not correct with respect to human kidney?

- a) The peripheral region is called cortex and central is called medulla.
- b) Malpighian corpuscles are present in the cortical region.
- c) Blood enters glomerulus through efferent arterioles.
- d) The concave part of kidney is called hilus.

83. In ureotelic animals, urea is formed by _____

- a) Ornithine cycle b) Cori cycle c) Krebs' cycle d) EMP pathway

84. In crustaceans, the excretory functions are performed by:

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- a) Antennal glands b) green glands c) Both (1) & (2) d) Malpighian tubules
85. Removal of proximal convoluted tubule from the nephron will result in____
a) More concentrated urine b) No change in quality and quantity of urine
c) No urine formation d) More diluted urine
86. In peritoneal dialysis
a) the blood is removed from the body and a natural filter is used
b) the blood is not removed from the body and a natural filter is used
c) the blood is not removed from the body and an artificial filter is used
d) the blood is removed from the body and an artificial filter is used
87. The most toxic nitrogenous waste excreted by many bony fishes, aquatic amphibians and aquatic insects is
a) Ammonia b) Urea c) Uric acid d) Both (2) & (3)
88. Uric acid is an excretory product of
(a) Cockroach
(b) Sparrow
(c) Terrestrial reptiles
(d) Man
a) (a) & (d) b) (b) & (d) c) (a), (b), & (c) d) (a), (c) & (d)
89. Human beings are
a) Uricotelic b) Ureotelic c) Ammonotelic d) Both (2) & (3)
90. Earthworms are____
a) uricotelic when plenty of water is available b) uricotelic under conditons of water scarcity
c) ammonotelic when plenty of water is available
d) ureotelic when plenty of water is available.
91. Aldosterone stimulates the reabsorption of
a) Na⁺ ions b) k⁺ ions c) Glucose d) Ca²⁺ ions
92. The maximum amount of electrolytes and water (70 - 80 percent) from the glomerular filtrate is reabsorbed in which pert of the nephron?
a) Ascending limb of loop of Henle b) Distal convoluted tubule
c) Proximal convoluted tubule d) Descending limb of loop of Henle
93. The number of nephrons in a kidney is equal to:
a) the number of Bowman's capsules
b) the sum of Bowman's capsules and Malpighian bodies
c) the sum of Bowman's capsules and glomeruli
d) double the number of Bowman's capsules.
94. Bowman's glands are found in____
a) external auditory canal b) cortical nephrons only c) juxtamedullary nephrons
d) olfactory epithelium
95. The main function of loop of Henle is
a) Blood filtration b) Urine formation c) Water conservation d) Both (1) & (2)

96. The characteristic(s) common to urea, uric acid and ammonia is/are

- (i) They are nitrogenous wastes.
 - (ii) They all need very large amount of water for excretion.
 - (iii) They are all equally toxic.
 - (iv) They are produced in the kidneys.
- a) (i), (iii) and (iv) b) (i) only c) (i) and (iii) d) (i) and (iv)

97. Which one of the following options gives the correct categorisation of animals according to the type of nitrogenous waste they give out?

a)

Ammonotelic	Ureotelic	Uricotelic
Pigeon, humans	Aquatic amphibia, lizards	Cockroach, frog

b)

Ammonotelic	Ureotelic	Uricotelic
Frog, lizards	Aquatic amphibia, humans	Cockroach, pigeon

c)

Ammonotelic	Ureotelic	Uricotelic
Aquatic animals	Frog, amphibia, humans	Pigeon, lizards, cockroach

d)

Ammonotelic	Ureotelic	Uricotelic
Aquatic animals	Cockroach, amphibia, humans	Frog, pigeon, lizards

98. Consider the following water conservation mechanisms

- A. Nasal countercurrent mechanism
- B. Dependence on metabolic water
- C. Highly hypertonic urine
- D. Living more on protein rich diet

The kangaroo rat living in desert can survive without drinking water because of

- a) A, B & C b) A, B & D c) B, C & D d) A, C & D

99. Presence of glucose (glycosuria) and ketone bodies (ketonuria) in urine are indicative of _____.

- a) Renal failure b) Diabetes mellitus c) Bright's disease d) Renal stone

100. **Assertion:** Tubular secretion removes foreign bodies, ions and molecules from the body.

Reason: As much as 99 per cent of the material in the filtrate is reabsorbed from the body because of tubular secretion.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

101. Which of the following statements are correct?
(i) Renal vein takes blood away from kidney.
(ii) Urine gets diluted in ascending limb of loop of Henle.
(iii) Podocytes occur in inner wall of Bowman's capsule.
(iv) Ultrafiltrate/nephric filtrate is plasma minus proteins.
a) (i) and (ii) b) (i) and (iii) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)
102. Effective filtration pressure in glomerulus is caused due to
a) powerful pumping action of the heart b) secretion of adrenaline
c) afferent arteriole is slightly wider than efferent arteriole
d) vacuum develops in proximal convoluted tubule and sucks the blood.
103. Read the given statements and select the correct option.
Statement 1: The final reabsorption of water from the urine into the blood occurs through the collecting duct of a mammalian nephron resulting in the production of hyperosmotic urine.
Statement 2: The loop of Henle creates a sodium gradient in the interstitial fluid.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.
104. A large quantity of one of the following is removed from our body by lungs.
a) CO_2 only b) H_2O only c) CO_2 and H_2O d) Ammonia
105. Glucose and amino acids in the filtrate are reabsorbed by tubular epithelial cells through
a) Active transport b) Passive transport c) Both (1) & (2) d) Osmosis
106. Chemically glomerular filtrate is similar to blood plasma, except
a) Urea b) Urea c) Proteins d) Electrolytes
107. Hormone responsible for the absorption of water in DCT is
a) ADH b) ACTH c) Oxytocin d) Insulin
108. A notch present on the inner medial side of kidney is known as
a) ureter b) pelvis c) hilus d) pyramid
109. Which of the following statements is/are incorrect regarding the collecting duct?
(i) It extends from the cortex to medulla.
(ii) Large amount of water could be reabsorbed by it to produce concentrated urine.
(iii) Small amount of urea diffuses into it from the medulla to keep up the osmolarity.
(iv) It plays a role in maintaining pH and ionic balance of blood by the selective secretion of H^+ and K^+ ions.
a) Only (i) b) Only (iii) c) (ii) and (iii) d) (i) and (iv)
110. If a healthy man drinks one litre of water on occasion A and one litre of 0.9% saline on occasion B, what shall we expect in two hours?

a)

Occasion A		Occasion B	
Volume of urine	Concentration of Na ⁺ in urine	Volume of urine	Concentration of Na ⁺ in urine
+++	+	+	+++

b)

Occasion A		Occasion B	
Volume of urine	Concentration of Na ⁺ in urine	Volume of urine	Concentration of Na ⁺ in urine
+++	+	+	+

c)

Occasion A		Occasion B	
Volume of urine	Concentration of Na ⁺ in urine	Volume of urine	Concentration of Na ⁺ in urine
++	++	++	+++

d)

Occasion A		Occasion B	
Volume of urine	Concentration of Na ⁺ in urine	Volume of urine	Concentration of Na ⁺ in urine
+++	++	+++	+++

111. Which of the following statements are false?

- (i) Outer cortex and inner medulla are the two zones in kidney.
- (ii) Medulla is divided into few renal pyramids.
- (iii) Pyramid projects into calyx.
- (iv) Inward extension of cortex between the pyramids is called renal column of Bertini.

a) (i) and (iv) b) (ii) and (iv) c) (ii) and (iii) d) None of these

112. Which of the following component of blood does not enter into the nephron?

a) Water b) Glucose c) Urea d) Plasma proteins

113. Which of the following is not metabolised in human body and therefore, used in determining glomerular filtration rate?

a) Insulin b) Inulin c) Cellulose xanthate d) Toxic ketones

114. In Ornithine cycle, which of the following wastes are removed from the blood?

a) CO₂ and urea b) Ammonia and urea c) CO₂ and ammonia d) Urea and urine

115. What will happen if the stretch receptors or the urinary bladder wall are totally removed?

- a) Micturition will continue
- b) Urine will continue to collect normally in the bladder
- c) There will be no micturition
- d) Urine will not collect in the bladder

116. Which one of the following is correct with reference to haemodialysis?

- a) Absorbs and resends excess of ions
- b) The dialysis unit has a coiled cellophane tube
- c) Blood is pumped back through a suitable artery after haemodialysis
- d) Nitrogenous wastes are removed by active transport

117. Which one of the following statements is incorrect?

a)

The medullary zone of kidney is divided into a few conical masses called medullary pyramids projecting into the calyces

b)

Inside the kidney the cortical region extends in between the medullary pyramids as renal pelvis.

c) Glomerulus along with Bowman's capsule is called the renal corpuscle

d)

Renal corpuscle, proximal convoluted tubule (PCT) and distal convoluted tubule (DCT) of the nephron are situated in the cortical region of kidney.

118. If Henle's loop were absent from mammalian nephron, which of the following is to be expected?

a) The urine will be more dilute b) There will be no urine formation

c) There will be hardly any change in the quality and quantity of urine formed

d) The urine will be more concentrated.

119. Nitrogenous waste products are eliminated mainly as ____

a) urea in tadpole and ammonia in adult frog b) ammonia in tadpole and urea in adult frog

c) urea in both tadpole and adult frog d) urea in tadpole and uric acid in adult frog

120. Which one of the following is not normally excreted in urine?

a) Uric acid b) Haemoglobin c) Ketone bodies d) Hippuric acid

121. Which of the following options has the correct pair of nephron parts that maintain pH and ionic balance of blood?

a) Proximal convoluted tubule and Henle's loop

b) Distal convoluted tubule and collecting duct

c) Proximal convoluted tubule and glomerulus d) Collecting duct and Henle's loop

122. Proximal and distal convoluted tubules are parts of ____

a) seminiferous tubules b) nephron c) oviduct d) vas deferens

123. Select the correct option representing the excretory organs present in (i) earthworm, (ii) centipede, (iii) prawn, and (iv) flatworm.

a)

(i)	(ii)	(iii)	(iv)
Malpighian tubules	Flame cell	Nephridia	Green gland

b)

(i)	(ii)	(iii)	(iv)
Flame Cell	Green gland	Malpighian tubules	Nephridia

c)

(i)	(ii)	(iii)	(iv)
Nephridia	Malpighian tubules	Green gland	Flame cell

d)

(i)	(ii)	(iii)	(iv)
Green gland	Nephridia	Flame cell	Malpighian tubules

124. The part of nephron involved in active reabsorption of sodium is :
 a) Distal convoluted tubule b) Proximal convoluted tubule c) Bowman's capsule
 d) Descending limb of Henle's loop
125. Which one of the following is a correct pair showing the function of a specific part of the human nephron?
 a)
 Podocytes: create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule
 b) Henle's loop: most reabsorption of the major substances from the glomerular filtrate
 c) Distal convoluted tubule: reabsorption of K^+ ions into the surrounding blood capillaries
 d) Afferent arteriole: carries the blood away from the glomerulus towards renal vein
126. Which of the following pairs is wrong?
 a) Uricotelic - Birds b) Ureotelic - Insects c) Ammonotelic - Tadpole
 d) Ureotelic - Elephant

127. Match the abnormal conditions given in Column A with their explanations given in Column B and choose the correct option.

Column A	Column B
A. Glycosuria	(i) Accumulation of uric acid in joints
B. Renal calculi	(ii) Inflammation in glomeruli
C. Glomerular nephritis	(iii) Masses of crystallised salts within the kidney
D. Gout	(iv) Presence of glucose in urine

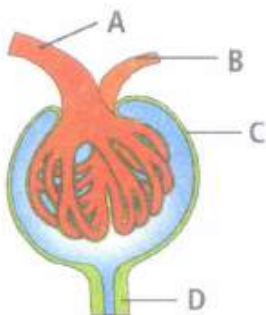
- a) A-(i), B-(iii), C-(ii), D-(iv) b) A-(iii), B-(ii), C-(iv), D-(i) c) A-(iv), B-(iii), C-(ii), D-(i)
 d) A-(iv), B-(ii), C-(iii), D-(i)
128. Maximum water reabsorption occurs in
 a) DCT b) PCT c) Collecting duct d) Descending limb of loop of Henle
129. Which of the following is removed from the filtrate at loop of Henle?
 a) Amino acids b) Hormones c) Water d) Glucose
130. Which is the first step of urine formation?
 a) Ultrafiltration b) Tubular secretion c) Selective secretion d) Tubular reabsorption
131. Which one is the vasoconstrictor?
 a) ANF b) Renin c) Glycosuria d) Haematuria
132. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Delivers blood to glomerulus	(i) Ascending and descending limbs
B. Carries urine to pelvis	(ii) Renal artery
C. Collects filtrate from Bowman's capsule	(iii) Collecting duct
D. Loop of Henle	(iv) PCT

- a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(i), B-(iii), C-(ii), D-(iv) c) A-(ii), B-(iv), C-(i), D-(iii)
 d) A-(iv), B-(iii), C-(ii), D-(i)
133. Which one of the following is not a part of a renal pyramid?

- a) Peritubular capillaries b) Convoluted tubules c) Collecting ducts d) Loop of Henle
134. Least toxic nitrogenous waste among the following is
a) Urea b) Uric acid c) Ammonia d) More than one option is correct
135. Uricotelism is found in _____
a) Mammals and birds b) Fishes and fresh water protozoans
c) Birds, reptiles and insects d) Frogs and toads
136. Which part of brain sends voluntary motor signals to smooth muscles of urinary bladder when the bladder get filled with urine?
a) Medulla b) Cerebral cortex c) Hypothalamus d) Brain stem
137. Consider the following statements each with two blanks.
(i) Annelids have (1), and insects have (2) for excretion.
(ii) Blood enters the glomerulus via (3) arteriole and leaves via (4) arteriole.
(iii) During micturition, the urinary bladder (5) and the urethral sphincters (6).
Which one of the following options correctly fills the blanks in any two of the above statements?
a) (1)-Malpighian tubules, (2)-flame cells, (5)-contracts, (6)-relax
b) (3)-afferent, (4)-efferent, (5) - contracts, (6)-relax
c) (1)-nephridia, (2)-Malpighian tubules, (5)-relaxes, (6)-contract
d) (3)-efferent, (4)-afferent, (5)-relaxes, (6)-contract
138. Consider the following four statements (i-iv) and select the option that correctly identifies the true (T) and false (F) ones.
(i) Atrial natriuretic factor can cause vasodilation (dilation of blood vessels) and thereby decreases the blood pressure.
(ii) On an average, 60-70 gm of urea is excreted out per day.
(iii) Sebaceous glands eliminate certain substances like NaCl, urea and lactic acid through sebum.
(iv) PCT is lined by simple cuboidal brush border epithelium which increases the surface area for reabsorption.
- | a) | b) | c) | d) |
|------------------|------------------|------------------|------------------|
| (i)(ii)(iii)(iv) | (i)(ii)(iii)(iv) | (i)(ii)(iii)(iv) | (i)(ii)(iii)(iv) |
| F F T T | F T T T | T F F T | T T F T |
139. Aquatic reptiles are _____
a) ammonotelic b) ureotelic c) ureotelic in water d) ureotelic over land
140. Which is the laegest digestive gland of our body?
a) Liver b) Lung c) Brain d) Stomach
141. Read the given statements and select the correct option.
Statement 1: The urinary bladder dilates a good deal as urine trickles into it from the ureters.
Statement 2: Urinary bladder is lined throughout by transitional epithelium.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect

- c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.
142. The outline of principal events of urination is given below in random manner.
(i) Stretch receptors on the wall of urinary bladder send signals to the CNS.
(ii) The bladder fills with urine and becomes distended.
(iii) Micturition.
(iv) CNS passes on motor messages to initiate the contraction of smooth muscles of bladder and simultaneous relaxation of urethral sphincter.
The correct sequence of the events is
a) (i) \rightarrow (ii) \rightarrow (iii) \rightarrow (iv) b) (iv) \rightarrow (iii) \rightarrow (ii) \rightarrow (i) c) (ii) \rightarrow (i) \rightarrow (iv) \rightarrow (iii)
d) (iii) \rightarrow (ii) \rightarrow (i) \rightarrow (iv).
143. Part not belonging to uriniferous tubule is _____.
a) glomerulus b) Henle's loop c) distal convoluted tubule d) collecting tubule
144. Read the given statements and identify the structure referred here.
(i) Reabsorption in this region is minimum.
(ii) This region plays a significant role in the maintenance of high osmolarity of interstitial fluid.
(iii) Its descending limb is permeable to water but almost impermeable to electrolytes.
(iv) Its ascending limb is impermeable to water but allows transport of electrolytes actively or passively.
a) PCT b) Loop of Henle c) DCT d) Bowman's capsule
145. A condition of failure of kidney to form urine is called _____.
a) deamination b) entropy c) anuria d) None of these
146. Which one of the following options shows a correct matching pair?
a) Man - Ureotelic b) Bird - Ammonotelic c) Fish - Uricotelic d) Frog - Uricotelic
147. A fall in GFR can activate the JG cells to release _____, which can stimulate the glomerular blood flow and thereby the GFR back to normal
a) Renin b) Angiotensin-II c) Rennin d) Erythropoietin
148. Loop of Henle is found in
a) Green gland b) Malpighian tubule c) Neuron d) Nephron
149. Uric acid is nitrogenous waste in _____.
a) mammals and molluscs b) birds and lizards c) frog and cartilaginous fishes
d) insects and bony fishes
150. The given figure represents the Malpighian body. Identify the labelled parts A to D and select the correct option.



a)

A	B	C	D
Efferent arteriole	Afferent arteriole	Bowman's capsule	Proximal convoluted tubule

b)

A	B	C	D
Afferent arteriole	Efferent arteriole	Renal corpuscle	Proximal convoluted tubule

c)

A	B	C	D
Afferent arteriole	Efferent arteriole	Bowman's capsule	Proximal convoluted tubule

d)

A	B	C	D
Afferent arteriole	Efferent arteriole	Bowman's capsule	Distal convoluted tubule

151. **Assertion:** Vasa recta is absent or highly reduced in cortical nephrons.

Reason: Cortical nephrons are mainly concerned with concentration of urine.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

152. Which of the following immune responses is responsible for rejection of kidney graft?

a) Humoral immune response b) Inflammatory immune response

c) Cell-mediated immune response d) Auto-immune response

153. Diuresis is the condition in which

a) the excretory volume of urine increases b) the excretory volume of urine decreases

c) the kidneys fail to excrete urine d) the water balance of the body is disturbed.

154. Nearly all of the essential nutrients, and 70-80% of electrolytes and water are reabsorbed in the

a) PCT b) Henle's loop c) DCT d) Collecting duct

155. **Assertion:** Glomerular filtration requires expenditure of energy by kidney.

Reason: Glomerular filtration occurs because pressure in the glomerular capillaries is lower than the pressure in Bowman's capsule.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

156. What will happen if one kidney is removed from the body of a human being?

a) Death due to poisoning b) Uremia and death c) Stoppage of urination

d) The person will survive

157. Select the incorrect statement regarding mechanism of urine formation in man.

a) The glomerular filtration rate is about 125 ml per minute.

b) The ultrafiltration is opposed by the colloidal osmotic pressure of plasma.

- c) Aldosterone induces greater reabsorption of sodium.
d) The counter current system contributes in diluting the urine.
158. The reabsorption of the sodium from glomerular filtrate is regulated by the hormone
a) glucagon b) secretin c) aldosterone d) adrenaline
159. Hyperosmolarity of interstitial fluid in renal medulla is maintained by retaining high concentration of
a) Urea b) TMAO c) Urea and NaCl d) Urea and Uric acid
160. Which of the following pairs of organisms are uricotelic?
a) Cartilaginous fish and mammals b) Reptiles and mammals c) Birds and insects
d) Bony fish and lizards
161. Counter current mechanism helps in concentrating urine in animals and mainly operates on
a. Henle's loop
b. Vasa-recta
c. PCT
d. b only
a) a only b) b only c) a and b d) All of these
162. Sweat contains
a) NaCl b) Lactic acid c) Small amount of urea d) All of these
163. The yellow colour of urine is due to the presence of
a) urea b) uric acid c) urochrome d) bilirubin.
164. Which is true about the difference between cortical and juxtamedullary nephrons?
a) Most nephrons are juxta medullary.
b) The efferent arterioles of cortical nephrons give rise to most of the vasa recta
c) The afferent arterioles of the juxtamedullary nephrons give rise to most of the vasa recta.
d) Juxtamedullary nephrons generate a hyperosmotic medullary interstitium
165. Pick the odd ones in each of the following groups and select the correct option.
(i) Renal pelvis, Medullary pyramid, Renal cortex, Renal papilla
(ii) Afferent arteriole, Henle's loop, Vasa recta, Efferent arteriole
(iii) Glomerular filtration, Antidiuretic hormone, Hypertonic urine, Collecting duct
(iv) Proximal convoluted tubule, Distal convoluted tubule, Henle's loop, Renal corpuscle

a)

(i)	(ii)	(iii)	(iv)
Renal pelvis	Henle's loop	Collecting duct	Distal convoluted tubule

b)

(i)	(ii)	(iii)	(iv)
Renal papilla	Afferent arteriole	Antidiuretic hormone	Henle's loop

c)

(i)	(ii)	(iii)	(iv)
Medullary pyramid	Efferent arteriole	Hypertonic urine	Proximal convoluted tubule

d)

(i)	(ii)	(iii)	(iv)
Renal cortex	Vasa recta	Glomerular filtration	Renal corpuscle

166. **Assertion:** DCT and collecting duct maintain the pH and ionic balance of blood.

Reason: DCTs of many nephrons open into a collecting duct.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

167. All are performed in a nephron, except

a) Filtration b) secretion c) Urea synthesis d) Reabsorption

168. Of the total nephrons, juxtamedullary nephrons constitute

a) 15% b) 45% c) 65% d) 85%.

169. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Lungs	(i) Lactic acid
B. Liver	(ii) Hypertonic urine
C. Micturition	(iii) Counter-current system
D. Sweat	(iv) CO_2
E. Vasa recta	(v) Urinary bladder
F. Sebum	(vi) Glucose
G. ADH	(vii) Bilirubin
H. Tubular reabsorption	(viii) Sterols

a) A-(iv), B-(vii), C-(v), D-(i), E-(iii), F-(viii), G-(ii), H-(vi)

b) A-(iii), B-(i), C-(iv), D-(viii), E-(ii), F-(v), G-(vii), H-(vi)

c) A-(iv), B-(viii), C-(i), D-(vi), E-(v), F-(iii), G-(ii), H-(vii)

d) A-(vii), B-(i), C-(iv), D-(iii), E-(viii), F-(vi), G-(v), H-(ii)

170. Which one of the following is not a Part of a renal Pelvis?

a) Peritubular capillaries b) Convoluted tubules c) Collecting ducts d) Loops of Henle

171. Most of vertebrates can maintain a constant internal osmolarity different from the surrounding medium, expect:

a) Myxine b) Sharks c) Bony fishes d) Both (1) & (2)

172. Glycosuria is the condition, where a man

a) eats more sugar b) excretes sugar in urine c) sugar is excreted in faeces

d) has low sugar level in blood.

173. Read the given statements and select the correct option.

Statement 1: Small amount of urea enters the thick segment of Henle's loop which is transported back to interstitium by collecting tubules.

Statement 2: Collecting tubules and thick segment of Henle's loop are permeable to urea.

- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
174. The pH of human urine is approximately
a) 6.5 b) 7 c) 6 d) 7.5
175. Dialysing unit (artificial kidney) contains a fluid which is almost same as plasma except that it has
a) high glucose b) high urea c) no urea d) high uric acid
176. **Assertion:** The kidneys have built in mechanisms for the regulation of glomerular filtration rate (GFR).
Reason: ANF mechanism is one such efficient mechanism.
a) If both assertion and reason are false.
b) If both assertion and reason are true and reason is the correct explanation of assertion.
c) If both assertion and reason are true but reason is not the correct explanation of assertion.
d) If assertion is true but reason is false.
177. Kidneys are reddish brown, bean-shaped structures situated between the levels of _____ thoracic and _____ lumbar vertebrae.
a) 11th; 10th b) 12th; 3rd c) 10th; 2nd d) 12th; 5th
178. Podocyte cells occur in
a) Glomerular capillaries b) Neck region of nephron c) Inner wall of Bowman's capsule
d) Outer wall of Bowman's capsule
179. A patient suffering from cholera is given saline drip because____
a) Cl^- ions are important component of blood plasma
b) Na^+ ions help to retain water in the body
c) Na^+ ions are important in transport of substances across membrane
d) Cl^- ions help in the formation of HCl in stomach for digestion
180. The function of renin is
a) stimulation of corpus luteum b) vasodilation c) to reduce blood pressure
d) conversion of angiotensinogen to angiotensin-I.
181. Match the items given in Column I with those in column II and select the correct option given below:

Column I	Column II
A. Glycosuria	(i) Accumulation of uric acid in joints
B. Gout	(ii) Mass of crystallised salts within the kidney
C. Renal calculi	(iii) Inflammation in glomeruli
D. Glomerular nephritis	(iv) Presence of glucose in urine

a)	b)	c)	d)																																
<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(ii)</td><td>(iii)</td><td>(i)</td><td>(iv)</td></tr></table>	A	B	C	D	(ii)	(iii)	(i)	(iv)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(i)</td><td>(ii)</td><td>(iii)</td><td>(iv)</td></tr></table>	A	B	C	D	(i)	(ii)	(iii)	(iv)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iii)</td><td>(ii)</td><td>(iv)</td><td>(i)</td></tr></table>	A	B	C	D	(iii)	(ii)	(iv)	(i)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iv)</td><td>(i)</td><td>(ii)</td><td>(iii)</td></tr></table>	A	B	C	D	(iv)	(i)	(ii)	(iii)
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A	B	C	D																																
(iv)	(i)	(ii)	(iii)																																

182. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. PCT	(i) Minimum reabsorption
B. DCT	(ii) Filtration of blood
C. Loop of Henle	(iii) Reabsorption of 70-80% electrolytes
D. Counter current mechanism	(iv) Ionic balance
E. Renal corpuscle	(v) Maintenance of concentration gradient in medulla

- a) A-(iii), B-(iv), C-(i), D-(v), E-(ii) b) A-(iii), B-(v), C-(iv), D-(ii), E-(i)
 c) A-(i), B-(iii), C-(ii), D-(v), E-(iv) d) A-(iii), B-(i), C-(iv), D-(v), E-(ii)

183. Find out incorrect statement w.r.t the cortical nephrons

- a) Most common nephrons in human kidney
 b) Bowman's capsule lies close to kidney surface c) Vasa recta is reduced or absent
 d) Control volume of plasma under stress condition

184. Angiotensinogen is a protein produced and secreted by

- a) juxtaglomerular (JG) cells b) macula densa cells
 c) endothelial cells (cells lining the blood vessels) d) liver cells.

185. Under normal conditions which one is completely reabsorbed in the renal tubule?

- a) Urea b) Uric acid c) Salts d) Glucose

186. A person is undergoing Prolonged fasting. His urine will be found to contain abnormal quantities of ____

- a) fats b) amino acid c) glucose d) ketones

187. Substances like glucose, amino acids, Na^+ etc. in the filtrate are reabsorbed by

- a) Active transport b) Passive transport c) Both active and passive transport
 d) Facilitated diffusion

188. Filtration of the blood takes place at

- a) PCT b) DCT c) collecting ducts d) Malpighian body.

189. In Hydra waste material of food digestion and nitrogenous waste material removed from _____

- a) mouth and body wall b) mouth and tentacles c) mouth and nematocyst
 d) body wall and tentacles

190. Which of the following statements are correct?

- (i) Glucose has high threshold value.
 (ii) Urine is concentrated in Henle's loop.
 (iii) Haemodialyser removes urea, uric acid, glucose and plasma proteins.
 (iv) In glomerulus, urea, uric acid, water, glucose and plasma proteins are filtered out.
 a) (i), (iii) and (iv) b) (ii), (iii) and (iv) c) (i) and (ii) d) (i) and (iii)

191. Renal calculi refers to the condition in which

- a) tumour is present in renal pelvis b) stone is formed in kidney
c) infection occurs in the pelvis region d) urea accumulates in the blood.
192. On an average, how much urea is excreted out per day by an adult human?
a) 25-20 g b) 15-20 g c) 35-40 g d) 40-45 g
193. Which of the following sequences is correct?
a)
An increase in body fluid volume → Switch off the osmoreceptors → Suppresses the ADH release
b)
ADH → Constricting effect on blood vessel → B.P.high → More glomerular blood flow → More GFR
c) Angiotensinogen → Angiotensin I → Angiotensin II → Adrenal cortex → Aldosterone
d) All of these
194. Which of the following is a powerful vasoconstrictor that increases the glomerular blood pressure and thereby the GFR?
a) Renin b) Angiotensin-II c) Aldosterone d) ANF
195. Which of the following organs, other than kidneys, also help in the elimination of excretory wastes?
a. Lungs
b. Liver
c. Skin
d. Sebaceous glands
a) a only b) a and b c) a, b and c d) a, b, c and d
196. Nitrogenous metabolic wastes in our body are the products of
a) Carbohydrates b) Proteins c) Lipids d) Vitamins
197. Which of the following is excretory product of liver?
a) More than one option is correct b) Carbon dioxide c) Bilirubin d) Biliverdin
198. Reabsorption of useful substances from glomerular filtrate occurs in____
a) collecting tube b) loop of Henle c) proximal convoluted tubule
d) distal convoluted tubule
199. The kidney of an adult frog is____
a) pronephros b) mesonephros c) metanephros d) opisthonephros
200. Which of the following does not favour the formation of large quantities of dilute urine?
a) Caffeine b) Renin c) Atrial-natriuretic factor d) Alcohol
201. Consider the following statements each with one or two blanks.
(i) The ascending limb of loop of Henle is impermeable to (1) but allows transport of (2).
(ii) (3) and (4) play a significant role in producing a concentrated urine.
(iii) A fall in glomerular blood flow/glomerular blood pressure/GFR can activate the JG cells to release (5).
Which one of the following options correctly fills the blanks in any two of the statements?

- a) (1)-water, (2)-electrolytes, (5)-renin b) (3)-Henle's loop, (4)-vasa recta, (5)-angiotensin
c) (1)-electrolytes, (2)-water, (3)-PCT, (4)-DCT
d) (3)-Henle's loop, (4)-vasa recta, (5)-angiotensinogen
202. **Assertion:** Nephrons are of two types: cortical and juxtamedullary according to their relative position in the cortex.
Reason: Juxtamedullary nephrons have short loop of Henle while cortical nephrons have long loop of Henle.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
203. A person who is not taking food or beverages will have _____ in urine.
a) little glucose b) less urea c) excess urea d) little fat
204. Which one of the following correctly explains the function of a specific Part of a human nephron?
a)
Podocytes: create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule
b) Henle's loop: most reabsorption of the major substances from the glomerular filtrate
c) Distal convoluted tubule: reabsorption of K^+ ions into the surrounding blood capillaries
d) Afferent arteriole: carries the blood away from the glomerular towards renal vein.
205. Diuretic substances like tea, coffee, alcohol etc. increases urine output by inhibiting release of hormone
a) Renin b) Aldosterone c) ADH d) Erythropoietin
206. Complete the following paragraph by selecting the option that correctly fills the blanks (i) - (iv).
The kidneys have built-in mechanisms for the regulation of glomerular filtration rate. One such efficient mechanism is carried out by (i). It is a special sensitive region formed by cellular modifications in the (ii) and the (iii) at the location of their contact. A fall in GFR can activate the JG cells to release (iv) which can stimulate the glomerular blood flow and thereby brings GFR back to normal.
- a)
- | (i) | (ii) | (iii) | (iv) |
|-----|------|--------------------|-------------|
| ANF | PCT | Efferent arteriole | Angiotensin |
- b)
- | (i) | (ii) | (iii) | (iv) |
|-----|------|--------------------|-------|
| ANF | DCT | Afferent arteriole | Renin |
- c)
- | (i) | (ii) | (iii) | (iv) |
|------|------|--------------------|-----------------|
| JGAP | PCT | Efferent arteriole | Angiotensinogen |
- d)
- | (i) | (ii) | (iii) | (iv) |
|--------|--------------------|-------|------|
| JGADCT | Afferent arteriole | Renin | |
207. **Assertion:** Stimulation of renin secretion will increase the volume of the extracellular fluid (ECF).
Reason: The increased ECF occurs due to decreased active reabsorption of Na^+ .
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false. d) If both assertion and reason are false.
208. We can produce concentrated/dilute urine. This is facilitated by a special mechanism. Identify the mechanism.
a) Reabsorption from PCT b) Reabsorption from Collecting duct
c) Reabsorption/Secretion in DCT d) Counter current mechanism in Henle's loop/Vasarecta
209. Which of the following is the correct pathway for passage of urine in humans?
a) Collecting tubule → Ureter → Bladder → Urethra
b) Renal vein → Renal ureter → Bladder → Urethra
c) Pelvis → Medulla → Bladder → Urethra d) Cortex → Medulla → Bladder → Ureter
210. Which part of nephron is impermeable to H_2O but allows transport of electrolytes actively or passively?
a) PCT b) Descending limb of Loop of Henle c) Ascending limb of Loop of Henle
d) DCT
211. How much amount of blood passes through the kidneys per minute in a healthy person?
a) 125-150 ml b) 600-700 ml c) 1100-1200 ml d) 180 litre
212. A large quantity of fluid is filtered everyday by nephrons in the kidneys but only about 1% of it is excreted as urine. The remaining 99% of the filtrate
a) is stored in the urinary bladder b) is reabsorbed into the blood
c) gets collected in the renal pelvis d) is lost as sweat.
213. Which of the following statements is correct?
a) The ascending limb of loop of Henle is impermeable to water
b) The descending limb of loop of Henle is impermeable to water
c) The ascending limb of loop of Henle is permeable to water.
d) The descending limb of loop of Henle is permeable to electrolytes
214. **Assertion:** Angiotensin II increases the glomerular blood pressure thereby GFR.
Reason: Angiotensin II activates the JG cells to release renin.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
215. Where do you find podocyte cells in human body?
a) Brain b) Liver c) Kidney d) Pancreas
216. Which one of the following statements in more dilute urine which one of the following statements in regard to the excretion by the human kidneys is correct?
a) Nearly 99% of the glomerular filtrate is reabsorbed by the renal tubules
b) Ascending limb of the loop of Henle is impermeable to electrolytes.
c) Descending limb of loop of Henle is impermeable to water
d) Distal convoluted tubule is incapable of reabsorbing HCO_3
217. In urinary system, aldosterone takes part in retention (reabsorption) of
a) K^+ b) Na^+ c) water d) both (b) and (c).

218. **Assertion:** Renal threshold of glucose is said to be 180 mg/100 mL.

Reason: Glucose starts appearing in the urine when its blood level exceeds 180 mg/100 mL of blood.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

219. The condition of accumulation of urea in the blood is termed as

a) renal calculi b) glomerulonephritis c) uremia d) ketonuria

220. Which of the following statements are correct?

(i) Reabsorption of water occurs passively in the initial segment of nephron.

(ii) Nitrogenous wastes are absorbed by passive transport.

(iii) Conditional reabsorption of Na^+ and water takes place in DCT.

(iv) DCT reabsorbs HOC_3^- .

(v) DCT is capable of selective secretion of H^+ , K^+ and NH_3 to maintain pH and $\text{Na}^+ - \text{K}^+$ balance in blood.

(vi) Substances like glucose, amino acids, Na^+ , etc., in the filtrate are reabsorbed actively.

a) (i) and (ii) b) (ii) and (iii) c) (iv) and (v) d) All of these



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

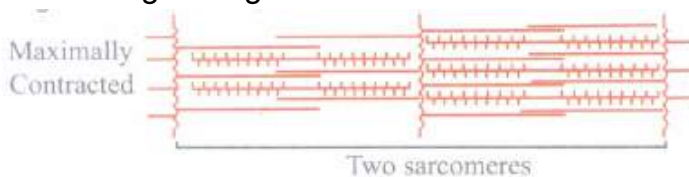
LOCOMOTION AND MOVEMENT 1

Marks : 880

- Which one of the following pairs of structures is correctly matched with their description?
a) Tibia and fibula - Both form parts of knee joint
b) Joint between atlas and axis - Pivot joint
c) Shoulder joint and elbow joint - Ball and socket type of joint
d) None of these
- The joints between the carpal bones are
a) gliding joints b) hinge joints c) saddle joints d) pivot joints
- Which ion is essential for muscle contraction?
a) Na b) K c) Ca d) Cl
- Match the two columns and select the correct option from the codes given below.

Types of synovial joint	Bones involved
A. Ball and socket	(i) Carpal and metacarpal of thumb
B. Hinge	(ii) Atlas and axis
C. Pivot	(iii) Frontal and parietal
D. Saddle	(iv) Knee
	(v) Humerus and pectoral girdle

- a) A-(v), B-(iv), C-(ii), D-(i) b) A-(i), B-(iii), C-(iv), D-(v) c) A-(v), B-(iv), C-(iii), D-(i)
d) A-(i), B-(ii), C-(v), D-(iv)
- Muscles with characteristic striations and involuntary are:
a) muscles of the eyelids. b) muscles in the wall of alimentary canal
c) muscles of the heart d) muscles assisting locomotion
 - Hinge joint is present between
a) Humerus and Radio-ulna b) Femur and Pelvic girdle c) Femur and Acetabulum
d) Humerus and Pectoral girdle
 - Which of the following is correct regarding changes in muscle fibre from relaxed to contracted state in the given figure?



- a) The length of the thick and thin myofilaments has changed.
b) Length of both anisotropic and isotropic band has changed.

- c)
The myosin cross-bridges move on the surface of actin and the thin and thick myofilaments slide past each other
d) Length of the sarcomere remains same.
8. Read the following statements and select the correct option.
Statement 1: Locomotion is the movement of an individual from one place to another.
Statement 2: All movements are locomotions but all locomotions are not movements.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
9. **Assertion:** On stimulation, a muscle cell releases calcium ions (Ca^{2+}) from sarcoplasmic reticulum.
Reason: By reacting with a protein complex, Ca^{2+} uncover active sites on the actin filaments.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
10. Which one of the following statements is true?
a) Head of humerus bone articulates with acetabulum of pectoral girdle.
b) Head of humerus bone articulates with glenoid cavity of pectoral girdle.
c) Head of humerus bone articulates with a cavity called acetabulum of pelvic girdle.
d) Head of humerus bone articulates with a glenoid cavity of pelvic girdle.
11. What is the type of movable joint present between the atlas and axis?
a) Pivot b) Saddle c) Hinge d) Gliding
12. Contractile unit of muscle is part of myofibril between
a) Z-line and I-band b) Z-line and Z-line c) Z-line and A-band d) A-band and I-band
13. Match column I with column II and select the correct option from the codes given below.
- | Column I (Skeletal part) | Column II (Number of bones) |
|-------------------------------------|-----------------------------|
| A. Cranium | (i) 29 |
| B. Skull (Cranial and facial bones) | (ii) 8 |
| C. Face | (iii) 14 |
| D. Hind limb | (iv) 24 |
| E. Ribs | (v) 30 |
- a) A-(i), B-(ii), C-(iii), D-(v), E-(iv) b) A-(ii), B-(i), C-(iii), D-(v), E-(iv)
c) A-(i), B-(ii), C-(iii), D-(iv), E-(v) d) A-(v), B-(iv), C-(iii), D-(ii), E-(i)
14. Total number of bones in the hind limb of man is _____.
a) 14 b) 30 c) 24 d) 21
15. Which one of the following statements is incorrect?
a) Heart muscles are striated and involuntary.
b) The muscles of hands and legs are striated and voluntary.

- c) The muscles located in the inner walls of alimentary canal are striated and involuntary.
d) Muscles located in the reproductive tracts are unstriated and involuntary.
16. What will happen if ligaments are cut or broken?
a) Bones will move freely at joints b) No movement at joints c) Bones will become unfixed
d) Bones will become fixed
17. Following is given a randomly arranged list of events that occur at neuromuscular junction to trigger muscle contraction.
(i) Receptor sites on sarcolemma
(ii) Nerve impulse
(iii) Release of Ca^{+2} from sarcoplasmic reticulum
(iv) The neurotransmitter acetylcholine is released
(v) Sarcomere shorten
(vi) Synaptic cleft
(vii) Spread of impulses over sarcolemma on T-tubules
Which of the following gives the correct sequence of these steps?
a) (ii) → (iv) → (i) → (vi) → (vii) → (iii) → (v)
b) (ii) → (iv) → (vi) → (i) → (vii) → (iii) → (v)
c) (i) → (ii) → (iii) → (iv) → (v) → (vi) → (vii)
d) (vii) → (vi) → (v) → (iv) → (iii) → (ii) → (i)
18. Acetabulum is located in
a) collar bone b) hip bone c) shoulder bone d) thigh bone
19. The protein whose removal enables myosin to bind actin in smooth muscle is
a) tropomyosin b) caldesmon c) myosin light chain kinase d) calmodulin
20. The type of muscle present in our
a) heart is involuntary and unstriated smooth muscle b) intestine is striated and involuntary
c) thigh is striated and voluntary d) upper arm is smooth muscle and fusiform in shape
21. Which one of the following is not a disorder of bone?
a) Rickets b) Atherosclerosis c) Arthritis d) Osteoporosis
22. Number of cervical vertebrae in most mammals is
a) 7 b) 6 c) 5 d) 11
23. Which of the following statements about the striated muscles is incorrect?
a) In the centre of each I - band is an elastic fibre (Z-line) which bisects it
b) Thin filaments are firmly attached to the Z-line
c) M-line is a fibrous membrane in the middle of A-bands d) None of these
24. The joint of femur with pelvic girdle is
a) hinge joint b) non-movable joint c) pivot joint d) ball and socket joint
25. Cyclosis, a characteristic of plant cells. this movement is due to
a) Sliding microtubule b) Cytoplasmic streaming c) Beating of cilia d) Podia formation
26. How many bones form the skeleton of the face?
a) 22 b) 8 c) 10 d) 14

27. Intercoastal muscles occur in _____
a) abdomen b) thigh c) ribs d) diaphragm
28. Smallest bone in human system is
a) stapes b) patella c) malleus d) incus
29. Name the ion responsible for unmasking of active sites for myosin for cross-bridge activity during muscle contraction
a) Calcium b) Magnesium c) Sodium d) Potassium
30. **Assertion** : Human has dicondylic skull.
Reason : Skull articulates with superior region of the vertebral column with the help of two occipital condyles.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
31. Select the correct statement regarding the specific disorder of muscular or skeletal system _____ .
a) Muscular dystrophy - age related shortening of muscles.
b) Osteoporosis - decrease in bone mass and higher chance of fractures with advancing age.
c) Myasthenia gravis - Auto immune disorder which inhibits sliding of myosin filaments.
d) Gout - inflammation of joints due to extra deposition of calcium.
32. Which of the following statements are incorrect regarding a normal human?
(i) The skull is dicondylic.
(ii) Metacarpals are five in numbers.
(iii) Patella is a cup-shaped bone covering and protecting the posterior articular surface of the knee joint.
(iv) Scapula is a large triangular flat bone, situated on the ventral side of the thorax.
(v) The pelvic girdle has two coxal bones
a) (i) and (v) b) (i) and (ii) c) (ii) and (v) d) (iii) and (iv)
33. Fill up the blanks in the following sentence by selecting the correct option.
The thin filaments of myofibril contain (A) actin and two filaments of (B) protein along with (C) protein for masking binding site for myosin.
- a)
- | | | |
|----|-------------|-------------|
| A | B | C |
| 1F | tropomyosin | tropomyosin |
- b)
- | | | |
|----|-------------|-------------|
| A | B | C |
| 1F | tropomyosin | tropomyosin |
- c)
- | | | |
|----|-------------|-------------|
| A | B | C |
| 2F | tropomyosin | tropomyosin |
- d)
- | | | |
|----|-------------|-------------|
| A | B | C |
| 2F | tropomyosin | tropomyosin |
34. Glenoid cavity articulates _____
a) Scapula with acromion b) Clavicle with scapula c) Humerus with scapula
d) Clavicle with acromion
35. Dark bands are

- a) A-band b) B-band c) I-band d) Z-line

36. A bundle of muscle fibre is called

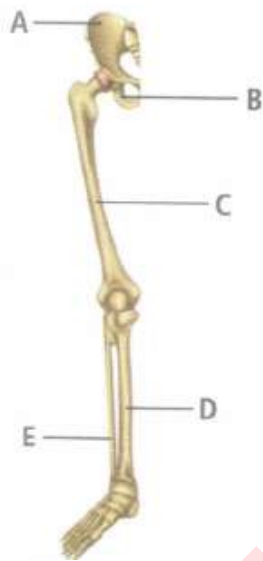
- a) Fascia b) Glenoid cavity c) Myocyte d) Fasciculus

37. Which of the following statements are correct regarding muscle proteins?

- (i) Actin is a thin filament and is made up of two F-actins.
 (ii) The complex protein, tropomyosin is distributed at regular intervals on the troponin.
 (iii) Myosin is a thick filament which is also a polymerised protein.
 (iv) The globular head of meromyosin consists of light meromyosin (LMM).

- a) (i), (ii) and (iii) b) (i), (ii) and (iv) c) (i) and (iii) d) (ii) and (iv)

38. The figure is showing part of right pelvic girdle and lower limb bones. Identify the parts labelled as A to E and select the correct option.



a)

A	B	C	D	E
Sacrum	Pubis	Patella	Metatarsal	Fibula

b)

A	B	C	D	E
Ilium	Ischium	Femur	Tibia	Fibula

c)

A	B	C	D	E
Ilium	Ischium	Femur	Fibula	Tibia

d)

A	B	C	D	E
Ischium	Ilium	Patella	Tibia	Tarsal

39. Which of the following contractile proteins contributes 55% of muscle protein by weight?

- a) Tropomyosin b) Troponin c) Myosin d) Actin

40. What is the name of joint between ribs and sternum?

- a) Cartilaginous joint b) Angular joint c) Gliding joint d) Fibrous joint

41. Intervertebral disc is found in the vertebral column of

- a) birds b) reptiles c) mammals d) amphibians

42. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Humerus	(i) Thigh
B. Pectoral girdle	(ii) Upper arm
C. Femur	(iii) Clavicle
	(iv) Acetabulum

	(v) Glenoid cavity
	(vi) Scapula

- a) A-(ii), (v); B-(iii), (vi); C-(i), (iv) b) A-(ii), (iv); B-(iii), (vi); C-(i), (v)
 c) A-(i), (v); B-(ii), (iv); C-(iii), (vi) d) A-(iii), (vi); B-(i), (v); C-(ii), (iv)

43. Ligament is a _____

- a) modified yellow elastic fibrous tissue b) inelastic white fibrous tissue
 c) modified white fibrous tissue d) None of the above

44. **Assertion:** Muscle fibre is a syncytium.

Reason: Muscle fibre has a large number of parallelly arranged myofilaments in the sarcoplasm.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false. d) If both assertion and reason are false.

45. The type of joint between the human skull bones is called

- a) cartilaginous joint b) hinge joint c) fibrous joint d) synovial joint

46. Consider the following statements each with one or two blanks.

(i) Each pectoral girdle consists of a (A) and a (B).

(ii) (C) is a condition of rapid spasms(wild contractions) in muscle due to low Ca^{++} in body fluid.

(iii) Each organised skeletal muscle in our body is made of a number of (D) held together by a common collagenous connective tissue layer called (E).

Which one of the following options correctly fills the blanks in any two of the statements?

- a) (C) - Muscular dystrophy, (D) - fascia, (E) - fascicle

- b) (A) - clavicle, (B) - scapula, (C) - Tetany

- c) (A) - ilium, (B) - ischium, (D) - fascicles, (E) - fascia

- d) (C) - Myasthenia gravis, (D) - fascicles, (E) - fascia

47. Complete the following paragraph by selecting the correct option.

Pelvic girdle consists of two coxal bones. Each coxal bone is formed by the fusion of three bones (i), (ii) and (iii). At the point of fusion of the above bones is a cavity called (iv) to which the thigh bone articulates. The two halves of the pelvic girdle meet ventrally to form the pubic symphysis containing (v) cartilage.

a)

(i)	(ii)	(iii)	(iv)	(v)
clavicle	scapula	sternum	glenoid	hyaline

b)

(i)	(ii)	(iii)	(iv)	(v)
ulna	radius	tarsal	acromion	fibrous

c)

(i)	(ii)	(iii)	(iv)	(v)
sacrum	scapula	clavicle	glenoid	yellow

d)

(i)	(ii)	(iii)	(iv)	(v)
ilium	ischium	pubis	acetabulum	fibrous

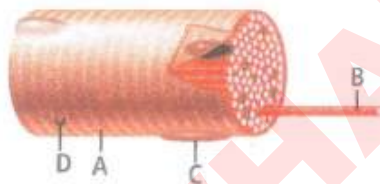
48. Smooth muscles are:

- a) Involuntary, fusiform, non-striated b) Voluntary, multinucleate, cylindrical

- c) Involuntary, cylindrical, striated d) Voluntary, spindle-shaped, uninucleate

49. In the resting muscle fibre, tropomyosin partially covers
a) calcium binding sites on troponin b) actin binding sites on myosin
c) myosin binding sites on actin d) calcium binding sites on actin.
50. Consider the following statements each with one or two blanks.
(i) Repeated activation of the muscles can lead to the accumulation of (A) due to anaerobic breakdown of glycogen in them, causing fatigue.
(ii) The globular head of meromyosin is an active ATPase enzyme and has binding sites for (B) and active sites for (C).
(iii) This central part of thick filament, not overlapped by thin filaments is called the (D).
Which one of the following options correctly fills the concerned blanks?
a) (A) - glucose, (D) - A-band b) (A) - pyruvic acid, (B) - troponin, (C) - myosin
c) (B) - ATP, (C) - actin, (D) - H-zone d) (A) - lactic acid, (D) - I-band
51. Which of the following is the most abundant mineral element in the skeletal muscle?
a) Sodium b) Calcium c) Potassium d) Phosphorus
52. Which of the following is/are not correctly matched pairs?
(i) Ball and socket joint - Between humerus and pectoral girdle
(ii) Pivot joint - Between carpal and metacarpal
(iii) Saddle joint - Between atlas and axis
(iv) Gliding joint - Between the carpals
(v) Fibrous joint - In flat skull bone
a) (ii) and (iii) b) (i) and (iv) c) (v) only d) (ii) only
53. Consider the following four statements (i) - (iv) and select the correct option.
(i) Actin is present in thin filament.
(ii) H-zone of striated muscle fibre represents both thick and thin filaments.
(iii) There are 11 pairs of ribs in man.
(iv) Sternum is present on ventral side of the body.
- | | | | |
|------------------|------------------|------------------|------------------|
| a) | b) | c) | d) |
| (i)(ii)(iii)(iv) | (i)(ii)(iii)(iv) | (i)(ii)(iii)(iv) | (i)(ii)(iii)(iv) |
| F F T F | F F F T | T F F T | T F T F |
54. The cervical vertebra called axis provides head with sideways rotation. This can be because
a) it is articulated to skull through occipital condyles b) it is fused with 1st vertebra atlas
c)
it is joined through elastic pads of fibrocartilage with other vertebrae, which provide mobility
d) it contains odontoid process that fits into the odontoid canal of atlas
55. Which of the following statements is incorrect?
a) Smooth muscles are found in urinary bladder alimentary canal and genital tract
b) A striated muscle is a syncytium i.e., a multinucleate structure
c) The cytoplasm of striated muscle is called endoplasm
d)
The plasma membrane and ER of striated muscles are called sarcolemma and sarcoplasmic reticulum respectively

56. The sheath covering the bundle of muscle fibres is
a) Epimysium b) Endomysium c) Perimysium d) Mesoderm
57. Long bones function in _____
a) support b) support, erythrocyte and leucocyte synthesis
c) support and erythrocyte synthesis d) erythrocyte formation
58. Calcium is important in skeletal muscle contraction because it _____
a) detaches the myosin head from the actin filament
b) activates the myosin ATPase by binding to it
c) binds to troponin to remove the masking of active sites on actin for myosin
d) prevents the formation of bonds between the myosin cross bridges and the actin filament
59. The movement which results in change of place
a) Locomotion b) Protoplasmic streaming c) Vital movement d) Elasticity
60. Which is a part of pectoral girdle?
a) Glenoid cavity b) Sternum c) Ileum d) Acetabulum
61. Which part can be easily felt as high point of shoulder?
a) Sterno - clavicle joint b) Acromian - clavicle joint c) Gleno - clavicle joint
d) Superior - clavicle joint
62. The given figure represents the histology of a striated muscle. Identify the parts labelled as A, B, C and D, and select the correct option.



a)

A	B	C	D
Sarcoplasm	Sarcolemma	Dark band	Light band

b)

A	B	C	D
Dark band	Myofibril	Nucleus	Light band

c)

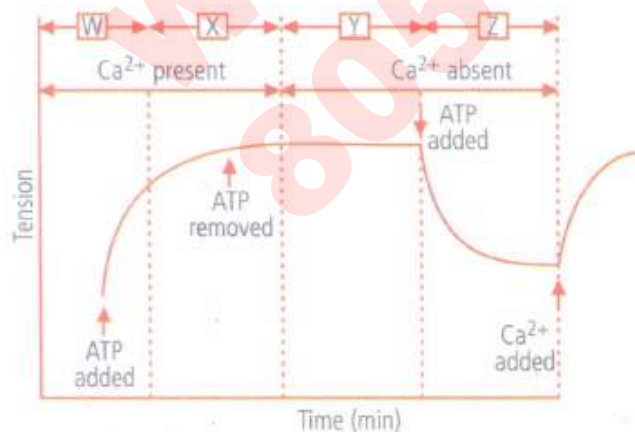
A	B	C	D
Light band	Myofibril	Nucleus	Dark band

d)

A	B	C	D
Nucleus	Dark band	Light band	Myofibril

63. The amoeboid movement results from
a) interactions among actin, myosin and ATP, etc. b) coordinated beats of cilia
c) whip like action of flagella
d) action by the mitotic spindle, similar to what happens during mitosis and meiosis
64. Which of the following is the contractile protein of a muscle?
a) Myosin b) Actin c) ropomyosin d) Tubulin
65. How many vertebro - chondral ribs are present in the human?
a) 7 pairs b) 2 pairs c) 3 pairs d) 12 pairs
66. If a muscle undergoes rapid contraction and relaxation, the sarcoplasmic reticulum extension
a) requires constant plugging in and out of Ca^{2+} b) rapidly synthesise myosin
c) does not require energy d) all of these

67. Humerus with its rounded upper end (head) articulates into
a) acromion process b) deltoid cavity c) glenoid cavity d) acetabulum
68. The dark band present on myofibril is
a) Isotropic band b) Anisotropic band c) Hensen's Zone d) M-line
69. Which of the following is incorrect regarding muscle contraction?
a) Actin and myosin make actomyosin b) Phosphate reserve comes from phosphocreatine
c) Chemical energy is converted into mechanical energy
d) Mechanical energy is converted into chemical energy
70. Cranium of human contains
a) 8 bones b) 14 bones c) 12 bones d) 20 bones
71. **Assertion :** Visceral muscles are smooth in appearance.
Reason: Many muscle cells assemble in a branching pattern to form a visceral muscle.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
72. Sella turcica, a depression enclosing the pituitary gland is found in
a) Temporal bone b) parietal bones c) Sphenoid bone d) Frontal bone
73. Osteoporosis is an age-related disease of skeletal system may occur due to the:
a) Immune disorder affecting neuromuscular junction leading to fatigue
b) High concentration of Ca^{++} and Na^{+} c) Decreased level of oestrogen
d) Accumulation of uric acid leading to inflammation of joints
74. Refer to the given graph carefully and answer the following question.



- Which of the labelled parts on the graph represents rigor mortis?
a) X b) W c) Z d) Y
75. _____ circulates blood to different parts of the body
a) Peristaltic movement of oesophagus b) Pumping of heart
c) Peristaltic movement of intestine d) Ciliary movement of oviduct
76. 11th and 12th pair of ribs which are imperfectly formed and do not reach the sternum are called
a) pseudo ribs b) false ribs c) floating ribs d) visceral ribs
77. The ion that must be present in adequate amount for binding of cross bridges with actin is

a) Ca^{+2} b) Na^{+} c) K^{+} d) Mg^{+2}

78. Synovial joint is exemplified by

a) pivot joint b) hinge joint c) ball and socket joint d) all of these

79. Which of the following statements about the mechanism of muscle contraction are correct?

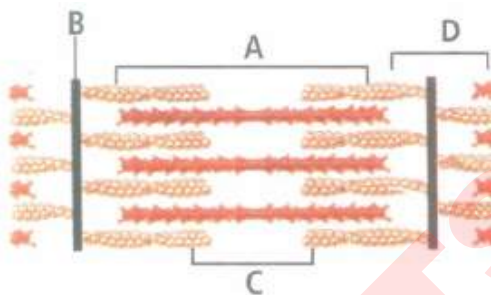
- (i) Acetylcholine is released when the neural signal reaches the motor end plate.
- (ii) Muscle contraction is initiated by a signal sent by CNS via a sensory neuron.
- (iii) During muscle contraction, isotropic band gets elongated.
- (iv) Repeated activation of the muscles can lead to lactic acid accumulation.

a) (i) and (iv) b) (i) and (iii) c) (ii) and (iii) d) (i), (ii) and (iii)

80. Which bone is keystone of the cranial floor?

a) Parietal b) Occipital c) Sphenoid d) Frontal

81. Given below is the figure of a sarcomere. Identify the parts labelled as A to D and select the correct option.



a)

A	B	C	D
A-band	Z -line	H-zone	I-band

b)

A	B	C	D
A-band	H-line	Z -zone	I-band

c)

A	B	C	D
I-band	H-line	Z-zone	A-band

d)

A	B	C	D
I-band	Z-line	H-zone	A-band

82. The lower jaw in mammals is made up of ____

a) mandible b) dentary c) maxilla d) angulars

83. Which one of the following options is incorrect?

- a) Hinge joint - between humerus and pectoral girdle
- b) Pivot joint - between atlas, axis and occipital condyle
- c) Gliding joint - between the carpals
- d) Saddle joint - between carpal and metacarpals of thumb

84. Muscle fatigue occurs due to accumulation of

a) CO_2 b) Myosin ATPase c) Lactic acid d) Creatine phosphate

85. Which of the following pairs, is correct matched?

- a) Hinge joint - between vertebrae
- b) Gliding joint - between zygapophyses of the successive vertebrae
- c) Cartilaginous - skull bones joint d) Fibrous joint - between phalanges

86. **Assertion:** Tetany is rapid spasm in muscle.

Reason: Tetany is usually caused by an increase in the blood calcium level.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.

87. Read the following statements carefully and select the correct ones.

- (i) Cardiac fibres are branched with one or more nuclei
 (ii) Smooth muscles are unbranched and cylindrical
 (iii) Skeletal muscles can be branched or unbranched
 (iv) Smooth muscles are non-striated
 a) only (iv) b) (ii) and (iii) c) (iii) and (iv) d) only (iii)

88. Saddle joint is present between

- a) Radius and ulna b) Carpals c) Carpal and metacarpal of thumb
 d) Ulna and humerus

89. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Amoeboid movement	(i) Limbs
B. Ciliary movement	(ii) Leucocytes
C. Flagellar movement	(iii) Trachea
D. Muscular movement	(iv) Spermatozoa

a)	b)	c)	d)
A B C D	A B C D	A B C D	A B C D
(iii)(ii)(i)(iv)	(ii)(iii)(iv)(i)	(i)(ii)(iii)(iv)	(iv)(ii)(i)(iii)

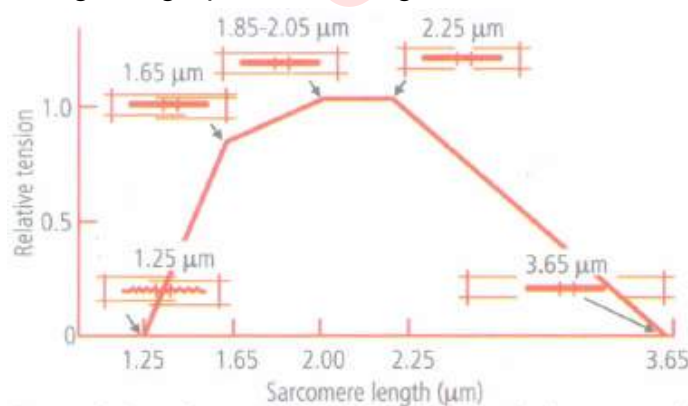
90. In which category of muscle fibres, contraction can be regulated by acetylcholine neurotransmitter?

- a) Skeletal muscle fibre b) Cardiac muscle fibre c) Smooth muscle fibres d) All of these

91. Knee joint and elbow joints are examples of

- a) saddle joint b) ball and socket joint c) pivot joint d) hinge joint.

92. The given graph shows length-tension curve for a typical vertebrate sarcomere.



By analysing the graph, what can you deduce regarding the muscle contraction?

- (i) Neither the myosin filaments nor the actin thin filaments change in length when a sarcomere shortens or is stretched. Instead, it is the extent of overlap between actin and myosin filaments that changes.
 (ii) The total tension produced by a sarcomere is proportional to the total number of cross-

bridges that can interact with actin filaments, and this number in turn is proportional to the amount of overlap between thick and thin filaments.

(iii) The tension produced by the muscle is maximal when the overlap between thick and thin filaments allows the largest number of myosin cross-bridges to bind to actin.

(iv) Tension drops off with increased length, because the thick and thin filaments overlap less and fewer cross-bridges can bind.

(v) Tension drops off with decreased length, because thin filaments at the two ends of the sarcomere begin to collide with each other, preventing further shortening.

a) (ii) only b) (i), (iii) and (iv) c) (i), (iii), (iv) and (v) d) (i), (ii), (iii), (iv) and (v)

93. **Assertion:** Mechanism of muscle contraction is explained by sliding-filament theory.

Reason: Contraction of muscle fibre takes place by the sliding of thick filaments over the thin filaments.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

94. **Assertion:** Ulna is longer than radius.

Reason : It has large olecranon process.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

95. The joint in which one of the two bones is fixed in its place and bears a peg like process over which the other bone rotates is called

a) hinge joint b) saddle joint c) pivot joint d) angular joint

96. What is sarcomere?

a) Part between two H-lines b) Part between two A-lines c) Part between two I-bands

d) Part between two Z-lines

97. The scapula is a large triangular flat bone situated in the dorsal part of the thorax between

a) second and seventh rib b) third and fourth rib c) fifth and sixth rib

d) second and fifth rib

98. According to sliding filament theory of muscle contraction, the filament that move to shorten a muscle are

a) Myosin b) Actin c) Collagen d) Creatine phosphate

99. The lactic acid generated during muscle contraction is finally converted to glycogen in

a) Muscle b) Kidney c) Liver d) Pancreas

100. Which of the following statements about the molecular arrangement of actin and myosin in myofibrils is/are incorrect?

(i) Each actin (thin filament) is made of 2F(filamentous) actins.

(ii) F-actin is the polymer of G (globular) actin.

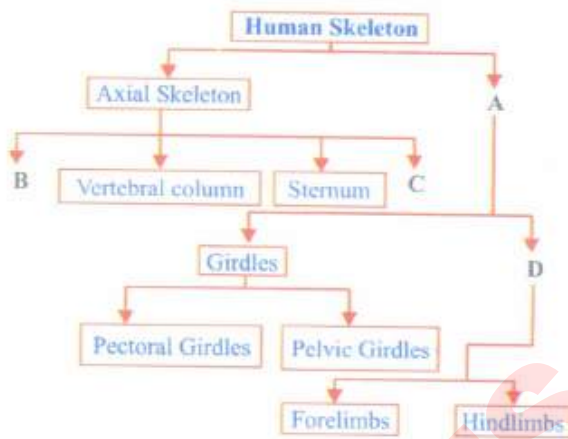
(iii) 2F-actins are twisted into a helix.

- (iv) Two strands of tropomyosin (protein) lie in the grooves of F-actin.
- (v) Troponin molecules (complex proteins) are distributed at regular intervals on the tropomyosin.
- (vi) Troponin forms the head of the myosin molecule.
- (vii) The myosin is a polymerised protein.
- a) (i), (iii) and (vii) b) (ii), (iv) and (v) c) Only (vi) d) Only (iii)

101. Which of the following structures contract and relax rhythmically to produce movement?

- a) Flagella b) Cilia c) Muscles d) Pseudopodia

102. Study the following flowchart and fill up the blanks by selecting the correct option.



a)

A	B	C	D
Thoracic skeleton	Limbs	Skull	Ribs

b)

A	B	C	D
Appendicular skeleton	Skull	Ribs	Limbs

c)

A	B	C	D
Appendicular skeleton	Limbs	Ribs	Skull

d)

A	B	C	D
Lumbar skeleton	Limbs	Skull	Ribs

103. The accumulation of uric acid crystals in the region of joints resulting in painful movements causes

- a) fluorodosis b) gout c) arthritis d) rheumatoid arthritis

104. Which one of the following pairs of chemical substances is correctly categorized?

- a) Calcitonin and thymosin - thyroid hormones
- b) Pepsin and prolactin - two digestive enzymes secreted in stomach
- c) Troponin and myosin - complex proteins in striated muscles
- d) Secretin and rhodopsin - polypeptide hormones

105. Macrophages and leucocytes exhibit

- a) ciliary movement b) flagellar movement c) amoeboid movement
- d) gliding movement.

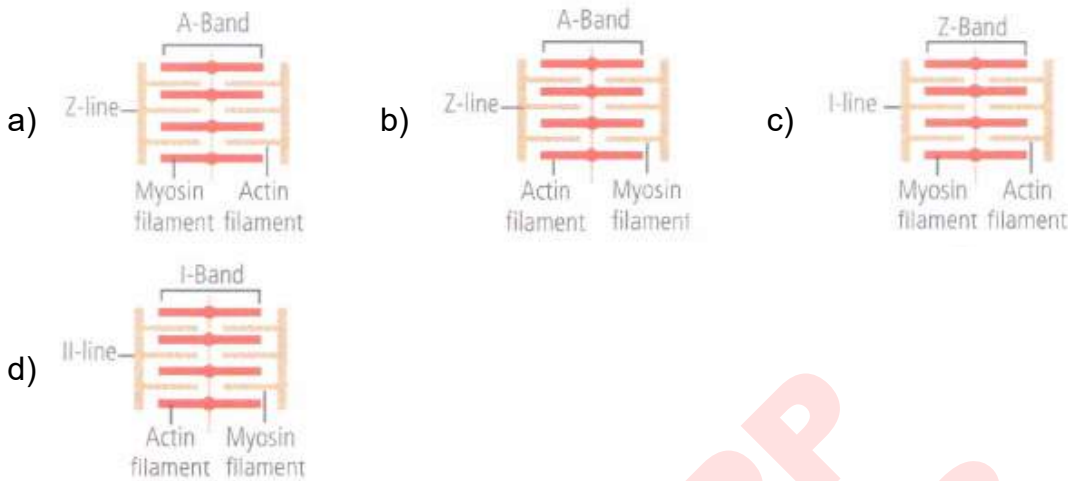
106. Match column I with column II and select the correct option from the codes given below:

Column I	Column II
A. Saddle joint	(i) Metacarpo-phalangeal joint
B. Gliding joint	(ii) Carpometacarpal joint of thumb
C. Hinge joint	(iii) Between tarsal bones

D. Ellipsoid joint (iv) Knee joint

- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(ii), B-(iii), C-(iv), D-(i) c) A-(iv), B-(iii), C-(ii), D-(i)
d) A-(iii), B-(ii), C-(iv), D-(i)

107. Which of the following sarcomeres is labelled correctly?



108. Appendicular skeleton includes

- a) girdles and their limbs b) vertebrae c) skull and vertebral column d) ribs and sternum

109. The coxal bone of the pelvic girdle is formed by the fusion of

- a) ilium, ischium and pubis b) scapula and clavicle c) ilium and scapula
d) ilium, scapula and ischium

110. A deltoid ridge occurs in _____

- a) radius b) ulna c) femur d) humerus

111. It is much easier for a small animal to run uphill than for a large animal because

- a) The efficiency of muscles in large animals is less than in the small animals
b) It is easier to carry a small body weight c) Smaller animals have a higher metabolic rate
d) Small animals have a lower O_2 requirement

112. A sarcomere consists of

- a) One A-band and one I-band b) Half A-band and two I-band
c) Half A-band and one I-bond d) One A-band and two half I-band

113. A human body contains how many muscles?

- a) 640 b) 639 c) 600 d) 700

114. When a bone breaks into more than two pieces, such a fracture is called

- a) simple fracture b) Green stick fracture c) Comminuted fracture d) Compound fracture

115. Human vertebral column consists of 33 vertebrae and _____ bones.

- a) 33 b) 26 c) 27 d) 29

116. Tendon is made up of _____

- a) adipose tissue b) modified white fibrous tissue c) areolar tissue
d) yellow fibrous connective tissue

117. **Assertion:** The joint between the atlas and axis is an example of gliding joint.

Reason: Gliding joint allows movement primarily in one plane.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
118. Skull of man is
a) tetracondylic b) monocondylic c) dicondylic d) tricondylic
119. Which of the following ions help in muscle contraction?
a) K^+ and Mg^{++} b) Na^+ and K^+ c) Ca^{++} and Na^{++} d) Ca^{++} and Mg^{++}
120. A collagenous connective tissue layer hold the muscle bundles together
a) Perimysium b) Endomysium c) Epimysium d) Fascia
121. The shoulder blade is made of:
a) clavicle b) humerus c) ilium d) scapula
122. During muscle contraction, actin and myosin form
a) actomyosin b) actoplasm c) plastosine d) myoplasm
123. Read the given statements and select the correct option.
Statement 1: Articulation between the occipital condyles and the atlas vertebra forms a hinge joint.
Statement 2: It permits the head to move in one plane only, i.e., nodding of head.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
124. Upon stimulation of skeletal muscles, calcium is immediately made available for binding to troponin from
a) blood b) lymph c) sarcoplasmic reticulum d) bone
125. Bone formed by the ossification of tendon is called as
a) Sesamoid b) Cartilage or replacing bone c) Investing or dermal bone
d) Membranous bone
126. ATPase enzyme needed for musck contraction is located in _____
a) actinin b) troponin c) myosin d) actin
127. Match column I with column II and select the correct option from the codes given below.
- | Column I | Column II |
|--|-----------------|
| A. Structural and functional unit of a myofibril | (i) H-zone |
| B. Protein of thin filament | (ii) Myosin |
| C. Protein of thick filament | (iii) Sarcomere |
| D. The central part of thick filament not overlapped by thin filament. | (iv) Actin |
- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(i), B-(iii), C-(ii), D-(iv) c) A-(i), B-(iv), C-(iii), D-(ii)
d) A-(iii),B-(iv), C-(ii), D-(i)
128. Passage of ova through female reproductive tract is facilitated by

- a) ciliary movement b) amoeboid movement c) flagellar movement d) cyclosis.
129. Read the given statements and select the correct option.
Statement 1: A primary myofilament is composed of a bundle of rod-like molecules of a protein myosin.
Statement 2: Myosin and actin together form a contractile apparatus.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
130. The joint of radio-ulna with the upper arm is
a) hinge joint b) socket joint c) pivot joint d) none of these
131. Extremities of long bones possess cartilage _____.
a) calcified b) fibrous c) elastic d) hyaline
132. ATPase of the muscle is located in
a) actinin b) troponin c) myosin d) actin.
133. What is sarcomere?
a) Part between two H-lines b) Part between two A-lines c) Part between two I-bands
d) Part between two Z-lines
134. The muscles is a specialised tissue which is originated from
a) Endosperm b) Mesoderm c) Ectoderm d) Yolk sac
135. Which is the best distinguishing feature of thoracic vertebrae?
a) they have larger transverse process b) their spinous process is directed posteriorly
c) they articulate with the ribs d) Absence of vertebral transverse foramen
136. The number of thick myofilaments (myosin) surrounding single thin myofilament (actin) are
a) 4 b) 3 c) 6 d) 2
137. Number of cervical vertebrae in camel is _____.
a) more than that of rabbit b) less than that of rabbit c) same as that of whale
d) more than that of horse
138. Which of the following is a source of energy for muscle contraction?
a) Actin b) ATP c) Myosin d) Actomyosin
139. The number of floating ribs, in the human body, is _____.
a) 6 pairs b) 5 pairs c) 3 pairs d) 2 pairs
140. One of the following is called hip bone
a) Innominate b) Scapula c) Manubrium d) Coracoid
141. Sliding filament theory can be best explained as _____.
a) Actin and Myosin filaments shorten and slide pass each other.
b) Actin and Myosin filaments do not shorten but rather slide pass each other.

c)

When myofilaments slide pass each other, Myosin filaments shorten while Actin filaments do not shorten.

d)

When myofilaments slide pass each other Actin filaments shorten while Myosin filament do not shorten.

142. **Assertion:** Bone has very hard matrix whereas cartilage has pliable matrix.

Reason : Bone has calcium salts in its matrix whereas cartilage has chondroitin salts in its matrix.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

143. Elbow joint is an example of _____

a) hinge joint b) gliding joint c) ball and socket joint d) pivot joint

144. Amoeba shows movement with help of

a) Pseudopodia b) Flagella c) Cilia d) Muscle

145. Collar bone is known as

a) scapula b) clavicle c) pelvic girdle d) chevron bone.

146. Which of the following is not a function of vertebral column?

a) Protects spinal cord and supports the head

b) Serves as the point of attachment for ribs and musculature of the back

c) Supports tarsals and metacarpals d) Both (b) and (c)

147. The characteristics and an example of a synovial joint in humans is :

a)

Characteristics	Examples
Fluid cartilage between two bones, limited movements	Knee joints

b)

Characteristics	Examples
Fluid filled between two bones, provides cushion	Skull bones

c)

Characteristics	Examples
Fluid filled synovial cavity between two bones	Joint between atlas and axis

d)

Characteristics	Examples
Lymph filled between two bones limited movement	Gliding joint between carpals

148. Which of the following vertebra is formed from four vertebrae?

a) Sacrum b) Coccyx c) Atlas d) Axis

149. Which of the following components is a part of the pectoral girdle?

a) Sternum b) Acetabulum c) Glenoid cavity d) Ilium

150. Lumbar vertebrae are found in

- a) neck region b) abdominal region c) hip region d) thorax

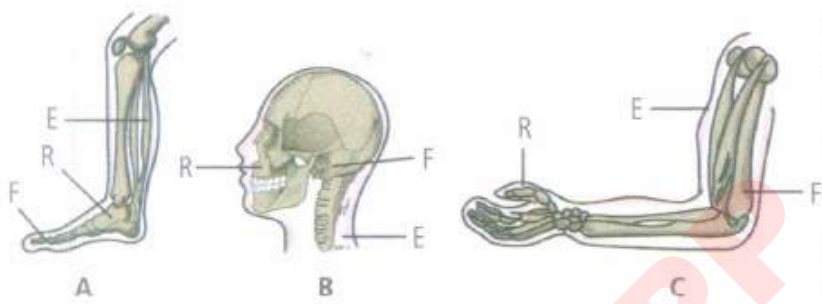
151. The specialised cells that make the muscular tissue are:

- a) Neuroblast b) Osteoblast c) Osteocytes d) Myocytes

152. The cells responsible for the resorption of bone matrix during the growth and remodelling of the skeleton are called

- a) Osteoblasts b) Osteoclasts c) Chondroblasts d) Chondroclasts

153. Refer to the given figures, (A, B and C) and arrange them in an order of first class lever, second class lever and third class lever.



- a) B, A, C b) C, A, B c) C, B, A d) A, C, B

154. Microfilaments are involved in

- a) amoeboid movement b) ciliary movement c) muscular movement d) both (a) and (b)

155. During muscular contraction, which of the following events occur?

- (i) H-zone disappears
- (ii) A-band widens
- (iii) I-band reduces in width
- (iv) Width of A-band is unaffected
- (v) M-line and Z-line come closer

- a) (i), (iii), (iv) and (v) b) (i), (ii) and (v) c) (ii), (iv) and (v) d) (i), (ii) and (iii)

156. In human body, which one of the following is anatomically correct?

- a) Collar bones - 3 pairs b) Salivary glands - 1 pair c) Cranial nerves - 10 pairs
d) Floating ribs - 2 pairs

157. Which of the following is the correct pairing regarding a specific disorder of muscular or skeletal system?

- a) Muscular dystrophy - Age related shortening of muscles
b) Osteoporosis - Decrease in bone mass and higher chances of fractures with advancing age
c) Myasthenia gravis - Autoimmune disorder which inhibits sliding of myosin filaments
d) Gout - Inflammation of joints due to extra deposition of calcium

158. In an adult human, how many bones are present as ear ossicles?

- a) 4 b) 6 c) 3 d) None of these

159. Which of the following is the contractile protein of a muscle?

- a) Myosin b) Tropomyosin c) Actin d) Tubulin

160. Which one of the following items gives its correct total number?

- a) Floating ribs in humans - 4 b) Amino acids found in proteins -16
c) Types of diabetes - 3 d) Cervical vertebrae in humans - 8
161. A cricket player is fast chasing a ball in the field. Which one of the following groups of bones are directly contributing in this movement?
a) Femur, malleus, tibia, metatarsals b) Tarsals, femur, metatarsals, tibia
c) Pelvis, ulna, patella, tarsals d) sternum, femur, tibia, fibula
162. Which is the only movable skull bone other than auditory ossicles?
a) Maxillae b) Mandible c) inferior nasal conchae d) Zygomatic
163. Tendons connect
a) Muscle to bone b) Bone to vertebral column c) Bone to bone d) Bone to cartilage
164. Identify the incorrectly matched pair.
- a)
- | Pair of skeletal parts | Category |
|------------------------|----------------|
| Sternum and ribs | Axial skeleton |
- b)
- | Pair of skeletal parts | Category |
|-----------------------------|---------------|
| Clavicle and glenoid cavity | Pelvic girdle |
- c)
- | Pair of skeletal parts | Category |
|------------------------|-----------------------|
| Humerus and ulna | Appendicular skeleton |
- d)
- | Pair of skeletal parts | Category |
|------------------------|--------------|
| Malleus and stapes | Ear ossicles |
165. Which of the following joints would allow no movement?
a) Fibrous joint b) Cartilaginous joint c) Synovial joint d) Ball and socket joint
166. The vertebral column is connected to the pelvic girdle in the
a) coccygeal region b) sacral region c) lumbar region d) cervical region.
167. The pivot joint between atlas and axis is a type of _____.
a) Cartilaginous joint b) Synovial joint c) Saddle joint d) Fibrous joint
168. **Assertion :** Fibrous joints play a significant role in locomotion.
Reason: Fibrous joints have fluid-filled cavity between the articulating surfaces of the two bones.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
169. **Assertion:** First seven pairs of ribs are called true ribs.
Reason: These ribs are not connected ventrally to the sternum.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
170. M-line passes through the centre of
a) Z-disc b) I-band c) HMM d) H-zone

171. Identify from the following list, the characteristics of red muscles (A) and white muscles (B) and select the option that correctly segregates the characters.

- (i) Less number of mitochondria
- (ii) More number of mitochondria
- (iii) Sarcoplasmic reticulum is abundant
- (iv) Myoglobin content high
- (v) Sarcoplasmic reticulum moderate
- (vi) Aerobic muscles
- (vii) Depend on anaerobic respiration for energy
- (viii) Less myoglobin content

a)

A	B
(i), (iii), (vii), (viii)	(ii), (iv), (v), (vi)

b)

A	B
(ii), (iv), (v), (vi)	(i), (iii), (vii), (viii)

c)

A	B
(i), (iii), (iv), (vii)	(ii), (v), (vi), (viii)

d)

A	B
(ii), (v), (vi), (viii)	(i), (iii), (iv), (vii)

172. Match the following and mark the correct option

	Column-I		Column-II
A	Fast muscle fibres	(i)	Myoglobin
B	Slow muscle fibres	(ii)	Lactic acid
C	Actin filament	(iii)	Contractile unit
D	Sarcomere	(iv)	I-band

- a) A-(i), B-(ii), C-(iv), D-(iii) b) A-(ii), B-(i), C-(iii), D-(iv) c) A-(ii), B-(i), C-(iv), D-(iii)
 d) A-(iii), B-(ii), C-(iv), D-(i)

173. Select the correct matching of the type of the joint with the example in human skeletal system.

a)

Type of joints	Examples
Cartilaginous joints	Between frontal and parietal

b)

Type of joints	Examples
Pivot joint	Between third and fourth cervical vertebrae

c)

Type of joints	Examples
Hinge joint	Between humerus and pectoral girdle

d)

Type of joints	Examples
Gliding joint	Between carpals

174. The H-zone in the skeletal muscle fibre is due to:

- a) The absence of myofibrils in the central portion of A-band
- b) The central gap between myosin filaments in the A-band
- c) The central gap between actin filaments extending through myosin filaments in the A-band
- d) Extension of myosin filaments in the central portion of the A-band

175. **Assertion:** A person undergoes fatigue very soon during exercise.

Reason : Muscle fibres undergo oxygen debt during exercise.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion

- c) If assertion is true but reason is false. d) If both assertion and reason are false.
176. Which statement is correct for muscle contraction?
a) Length of two Z-lines increase b) Length of H-line decreases
c) Length of A-band remains constant d) Length of I-band increases
177. Which of the following is a bone of skull?
a) Atlas b) Patella c) Ethmoid d) Phalanges
178. Low Ca^{++} in the body fluid may be the cause of _____
a) tetany b) anaemia c) angina pectoris d) gout
179. Imbalances of certain hormones, deficiencies of calcium and vitamin D are the major causative factors of
a) rheumatoid arthritis b) osteoporosis c) osteoarthritis d) gouty arthritis
180. Which of the following ribs are not connected ventrally with the sternum and are called as floating ribs?
a) First five pairs b) 8th, 9th, and 10th pairs c) 11th and 12th pair
d) 7th, 8th, and 9th pairs
181. Which one of the following is showing the correct sequential order of vertebrae in the vertebral column of human beings?
a) Cervical - lumbar - thoracic - sacral - coccygeal
b) Cervical - thoracic - sacral - lumbar - coccygeal
c) Cervical - sacral - thoracic - lumbar - coccygeal
d) Cervical - thoracic - lumbar - sacral - coccygeal
182. At rest when muscle is relaxed, the thin filaments interdigitate with the thick filaments only
a) outside A-band b) outside H-band c) inside A-band d) inside M-line
183. Which of the following muscular disorders is inherited?
a) Muscular dystrophy b) Myasthenia gravis c) Botulism d) Tetany
184. Odontoid process is present with which vertebrae of vertebral column?
a) Atlas vertebrae b) Axis vertebrae c) vertebrae prominens d) Lumbar vertebrae
185. Which of the following correctly characterises a "fast oxidative" type of skeletal muscle fibre?
a) Few mitochondria and high glycogen content
b) Low myosin ATPase rate and few surrounding capillaries
c) Low glycolytic enzyme activity and intermediate contraction velocity
d) High myoglobin content and intermediate glycolytic enzyme activity
186. The type of muscle fibre present in the wall of alimentary canal is
a) smooth muscle fibre b) striped muscle fibre c) cardiac muscle fibre
d) both (a) and (b)
187. Which of the following bones form a link between axial and appendicular skeleton?
a) First rib b) Clavicle c) Scapula d) Both (a) and (b)
188. The two cells of the body which show pseudopodial movement are

- a) RBC and WBC b) WBC and macrophages c) Liver cell and WBC
d) Macrophages and liver cell

189. Ribs are attached to

- a) scapula b) sternum c) clavicle d) ilium.

190. Number of floating ribs are

- a) 2 pairs b) 12 pairs c) 7 pairs d) 3 pairs

191. Which of the following is not a function of the skeletal system?

- a) Storage of minerals b) Production of body heat c) Locomotion
d) Production of erythrocytes

192. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. True ribs	(i) 3 pairs
B. False ribs	(ii) 2 pairs
C. Floating ribs	(iii) 7 pairs

- a) A-(i), B-(ii), C-(iii) b) A-(iii), B-(i), C-(ii) c) A-(iii), B-(ii), C-(i) d) A- (ii), B- (i), C-(iii)

193. Sheet or broad band of fibrous connective tissue that is deep is deep to the skin and surrounds entire muscles and other organs of body are

- a) Epimysium b) Fascicle c) Endosperm d) Fascia

194. Glenoid cavity is associated with

- a) Pelvic girdle b) Coracoid c) Clavicle d) Scapula

195. Ends of long bones are covered with:

- a) blood cells b) muscles c) cartilages d) ligaments

196. Which one of the following is correct pairing of a body part and the kind of muscle tissue that moves it?

- a) Abdominal wall-Smooth muscle fibres b) Abdominal wall-Smooth muscle
c) Iris-Involuntary smooth muscle d) Heart wall-Involuntary unstriated muscle

197. Lower jaw is made up of

- a) mandible b) Vomer c) Maxilla d) palatine

198. The plasma membrane of the muscle fibre is called

- a) Sarcoplasma b) Sarcolemma c) Sarcoplasmic Reticulum d) Syncytial

199. Acromion process is characteristically found in _____ the of mammals.

- a) pectoral girdle b) sperm c) pelvic girdle d) skull

200. During walking talus passes/transmits about the half of the weight of body to

- a) cuneiform b) Cuboid c) Calcaneum d) Navicular

201. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Smooth muscle	(i) Myoglobin
B. Tropomyosin	(ii) Thin filament
C. Red muscle	(iii) Sutures
D. Skull	(iv) Involuntary

- a) A-(iv), B-(ii), C-(i), D-(iii) b) A-(ii), B-(iv), C-(iii), D-(i) c) A-(iii), B-(i), C-(iv), D-(ii)
d) A-(i), B-(iv), C-(ii), D-(iii)
202. An acromian process is characteristically found in the_____
- a) pelvic girdle of mammals b) pectoral girdle of mammals c) skull of frog
d) sperm of mammals
203. Which of the following abnormality will include the secretion of abnormal granules - pannus?
- a) Osteoarthritis b) Rheumatoid arthritis c) Gout d) Osteoporosis
204. Anaerobic work becomes painful due to accumulation of
- a) Ca^{+2} ions b) Myosin c) Lactic acid d) Creatine phosphate
205. Out of 'X' pairs of ribs in humans only 'Y' pairs are true ribs. Select the option that correctly represent values of X and Y and provides their explanation.
- a)
- | | |
|---------------|---|
| X = 12, Y = 7 | True ribs are attached dorsally to vertebral column and ventrally to the sternum. |
|---------------|---|
- b)
- | | |
|---------------|---|
| X = 12, Y = 5 | True ribs are attached dorsally to vertebral column and sternum on the two end. |
|---------------|---|
- c)
- | | |
|---------------|---|
| X = 24, Y = 7 | True ribs are dorsal attached to vertebral column but are free on ventral side. |
|---------------|---|
- d)
- | | |
|----------------|---|
| X = 24, Y = 12 | True ribs are dorsal attached to vertebral column but are free on ventral side. |
|----------------|---|
206. Select the correct statement with respect to locomotion in humans ____
- a) Accumulation of uric acid crystals in joints causes their inflammation
b) The vertebral column has 10 thoracic vertebrae
c) The joint between adjacent vertebrae is a fibrous joint.
d) The decreased level of progesterone causes osteoporosis in old people.
207. The slow twitch muscle fibres which are rich in myoglobin and have abundant mitochondria are
- a) white skeletal muscles b) cardiac muscles c) red skeletal muscles
d) involuntary muscles
208. The structural and functional unit of myofibril which contracts to cause movement is called
- a) Sarcolemma b) Sarcomere c) Fascia d) Myosin
209. The functional unit of contractile system in a striated muscle is
- a) sarcomere b) Z-band c) cross bridges d) myofibril
210. Which of the following is not a function of locomotion?
- a) Procurement of food b) Finding mate c) Peristaltic movement
d) Searching and building of shelter
211. Which one of the following is the correct description of a certain part of a normal human skeleton?
- a) Parietal bone and the temporal bone of the skull are joined by fibrous joint.
b) First vertebra is axis which articulates with the occipital condyles.

- c) The 9th and 10th pairs of ribs are called the floating ribs.
d) Glenoid cavity is a depression to which the thigh bone articulates.
212. Actin binding sites are located on:
a) troponin b) tropomyosin c) meromyosin d) both (b) and (c).
213. Lack of relaxation between successive stimuli in sustained muscle contraction is known as _____
a) Spasm b) Fatigue c) Tetanus d) Tonus
214. Read the given statements and select the correct option.
Statement 1: Inflammation of a skeletal joint may immobilise the movements of the joint.
Statement 2: This may be caused due to uric acid crystals in the joint cavity and ossification of articular cartilage
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
215. If a stimulus, several times greater than the threshold stimulus, is provided to a muscle fibre, it will
a) contract with a larger force b) contract with a smaller force
c) contract with the same force d) undergo tetany
216. Match the following columns and select the correct option

Column - I	Column - II
A. Floating ribs	(i) Located between second and seventh ribs
B. Acromion	(ii) Head of the Humerus
C. Scapula	(iii) Clavicle
D. Glenoid cavity	(iv) Do not connect with the sternum

Select the correct option _____ .

- a) (iii),(ii),(iv),(i) b) (iv),(iii),(i),(ii) c) (ii),(iv),(i),(iii) d) (i),(iii),(ii),(iv)
217. **Assertion:** The portion of the myofibril between two successive Z-lines is considered as the functional unit of contraction called sarcomere.
Reason: During contraction, I-bands get reduced whereas A-bands retain the length, thereby causing shortening of the sarcomere.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
218. Myoglobin is present in
a) all muscle fibres b) white muscle fibres c) red muscle fibres d) none of these
219. **Assertion:** Biceps and triceps are antagonistic muscles.
Reason : The biceps flexes the arm and the triceps straightens the arm.

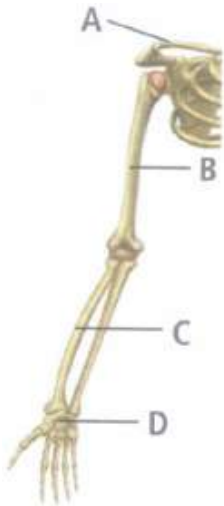
a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

220. Examine the figure of pectoral girdle and forelimb and Identify the parts labelled as A, B, C and D.



a)

A	B	C	D
Clavicle	Humerus	Radius	Carpals

b)

A	B	C	D
Scapula	Femur	Ulna	Tarsals

c)

A	B	C	D
Clavicle	Femur	Radius	Carpals

d)

A	B	C	D
Scapula	Humerus	Ulna	Tarsals



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

NEURAL CONTROL AND COORDINATION 1

Marks : 837

1. Which of the following is regarded as a unit of nervous tissue?
a) Myelin sheath b) Axons c) Dendrites d) Neurons
2. In the resting state of the neural membrane, diffusion due to concentration gradients, if allowed, would drive _____
a) K^+ into the cell b) K^+ and Na^+ out of the cell c) Na^+ into the cell d) Na^+ out of the cell
3. A list of steps involved in mechanism of vision is given below in a random order.
(i) Neural impulses are analysed and image formed on retina is recognised by visual cortex.
(ii) Membrane permeability changes.
(iii) Ganglion cells are excited.
(iv) Bipolar cells are depolarised.
(v) Action potentials (impulse) are transmitted by optic nerves to visual cortex.
(vi) Potential differences are generated in the photoreceptor cells.
(vii) Light energy causes a change in shape of rhodopsin, leading to the dissociation of retinal (an aldehyde of vitamin A) from opsin (a protein).
(viii) Structure of opsin is changed.
Which of the following options represents these events in a correct order?
a) (i), (ii), (iii), (iv), (v), (vi), (vii), (viii) b) (viii), (vii), (vi), (v), (iv), (iii), (ii), (i)
c) (i), (iv), (iii), (ii), (vii), (viii), (vi), (v) d) (vii), (viii), (ii), (vi), (iv), (iii), (v), (i)
4. The vagus nerve is the _____ cranial nerve.
a) 7th b) 5th c) 10th d) 9th
5. Respiratory centre is situated in _____
a) cerebellum b) medulla oblongata c) hypothalamus d) cerebrum
6. The structures in a human body that assist in body balance are located in the
a) outer ear b) middle ear c) inner ear d) Eustachian tube.
7. One of the examples of the action of the autonomous nervous system is _____
a) swallowing of food b) pupillary reflex c) peristalsis of the intestine
d) knee-jerk response
8. Nerve fibres transmit the nerve message by _____ means.
a) chemical b) physical c) electrochemical d) electrical
9. Corpus callosum connects two
a) cerebral hemispheres b) ventricles of brain c) cerebellar hemispheres
d) optic thalamus
10. Unidirectional transmission of a nerve impulse through nerve fibre is due to the fact that

- a) nerve fibre is insulated by a medullary sheath
 - b) sodium pump starts operating only at the cyton and then continues into the nerve fibre
 - c) neurotransmitters are released by dendrites and not by axon endings
 - d) neurotransmitters are released by the axon endings and not by dendrites
11. Which of the following statements is/are incorrect about the electrical synapse?
- (i) At electrical synapses, the membranes of pre and post synaptic neurons are in very close proximity.
 - (ii) Electrical current can flow directly from one neuron into the other across the synapses.
 - (iii) Transmission of an impulse across electrical synapses is very similar to impulse conduction along single axon.
 - (iv) Electrical synapses pass electrical signal between cells with the use of Ach.
 - (v) Electrical synapses are fast.
 - (vi) Electrical synapses are rare in our system
- a) (ii), (iv) and (v) b) (i) and (iii) c) (iv) only d) (i), (v) and (vi)
12. Four healthy people in their twenties got involved in injuries resulting in damage and death of a few cells of the following. Which of the cells are least likely to be replaced by new cells?
- a) Liver cells b) Neurons c) Malpighian layer of the skin d) Osteocytes
13. Hypoglossal nerve controls the movements of
- a) ear b) heart c) tongue d) limbs
14. Which of the following is not involved in knee-jerk reflex?
- a) Muscle spindle b) Motor neuron c) Brain d) Interneurons
15. **Assertion:** At fovea, the visual acuity is the greatest.
Reason: The fovea is a thick area of the retina where both rods and cones are present.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
16. Chemicals which are released at the synaptic Junction are called
- a) hormones b) neurotransmitters c) cerebrospinal fluid d) lymph.
17. Good vision depends on adequate intake of carotene rich food. Select the best option from the following statements.
- a) Vitamin A derivatives are formed from carotene
 - b) The photopigments are embedded in the membrane discs of the inner segment.
 - c) Retinal is a derivative of Vitamin A.
 - d) Retinal is a light absorbing part of all the visual photopigments
18. One function of parasympathetic nervous system is _____.
- a) contraction of hair muscles b) stimulation of sweat glands c) acceleration of heartbeat
d) constriction of pupil
19. The purplish red pigment rhodopsin contained in the rods type of photo receptor cells of the human eye, is a derivative of _____
- a) vitamin B b) vitamin C c) vitamin D d) vitamin A
20. Retina is most sensitive at _____
- a) optic disc b) periphery c) macula lutea d) fovea centralis

21. Which of the following nerves is purely a motor nerve?
a) Vagus b) Facial c) Abducens d) Trigeminal
22. Which part of the human brain controls the urge for eating and drinking?
a) Forebrain b) Midbrain c) Hindbrain d) Spinal cord
23. In a human being, the number of cranial nerves is
a) 12 pairs b) 6 pairs c) 20 pairs d) 10 pairs
24. Which one of the following is the correct difference between rod cells and cone cells of our retina?

a)

Rod cells	Cone cells
Vision in poor light	Colour vision and detailed vision in bright light

b)

Rod cells	Cone cells
More concentrated in centre of retina	Evenly distributed all over retina

c)

Rod cells	Cone cells
Low in number	High in number

d)

Rod cells	Cone cells
Iodopsin	Rhodopsin

25. **Assertion:** Electrical synapses are rare in our system.
Reason: Impulse transmission across an electrical synapse is slower than that across a chemical synapse.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
26. A touch on the right hand stimulates neurons in the
a) left somatic sensory area b) left occipital lobe c) right somatic sensory area
d) right occipital lobe.
27. Taste buds contain
a) gustatory receptors b) olfactory receptors c) photoreceptors d) phonoreceptors.
28. Which of the following statements are correct regarding $\text{Na}^+ - \text{K}^+$ pump?
(i) Needs energy (ATP) to work
(ii) Expels 3 Na^+ for every 2 K^+ ions imported
(iii) Works against a concentration gradient
(iv) Maintains resting potential
a) (i) and (iv) b) (ii) and (iii) c) (i) and (iii) d) All of these
29. What is intensity of sound in normal - conversation?
a) 10-20 decibel b) 30-60 decibel c) 70-90 decibel d) 120-150 decibel
30. A person entering an empty room suddenly finds a snake right in front on opening the door. Which one of the following is likely to happen in his neuro-hormonal control system?
a) Sympathetic nervous system is activated releasing epinephrin and norepinephrin from adrenal medulla.
b) Neuro transmitters diffuse rapidly across the cleft and transmit a nerve impulse.

c) Hypothalamus activates the parasympathetic division of brain.

d)

Sympathetic nervous system is activated releasing epinephrin and norepinephrin from adrenal cortex.

31. In a man, abducens nerve is injured. Which one of the following functions will be affected?

a) Movement of the eyeball b) Movement of the tongue c) Swallowing

d) Movement of the neck

32. The electrical potential difference between outside and inside of a nerve axon before excitation is known as

a) resting potential b) action potential c) spike potential d) reaction potential.

33. How many pairs of cranial nerves are mixed nerves?

a) 3 b) 5 c) 4 d) 6

34. Match column I with column II and select the correct option from the codes given below.

Column I		Column II
A. Cornea	(i)	Provides opening for light to enter
B. Iris	(ii)	Transduces blue, green and red light
C. Lens	(iii)	Controls the amount of light that enters
D. Optic nerves	(iv)	Alters the shape of lens
E. Pupil	(v)	Transmit information to the CNS
F. Ciliary muscles	(vi)	Focus light directly on retina
G. Fovea	(vii)	Bends light and protects inner eye

a) A-(vii), B-(iii), C-(vi), D-(v), E-(i), F-(iv), G-(ii)

b) A-(i), B-(ii), C-(iii), D-(iv), E-(v), F-(vi), G-(vii)

c) A-(vii), B-(vi), C-(v), D-(iv), E-(iii), F-(ii), G-(i)

d) A-(vii), B-(iv), C-(vi), D-(v), E-(i), F-(iii), G-(ii)

35. Human eye ball consists of three layers and it encloses

a) lens, iris, optic nerve b) lens, aqueous humor and vitreous humor c) cornea, lens, iris

d) cornea, lens, optic nerve

36. The correct sequence of meninges from inner to outer side is

a) duramater → arachnoid membrane → pia mater

b) duramater → pia mater → arachnoid membrane

c) piamater → arachnoid membrane → duramater

d) arachnoid membrane → duramater → pia mater.

37. Which of the following is not a reflex action?

a) Salivation b) Sweating c) Withdrawal of hand when pinched by needle

d) None of these

38. Cerebellum of brain is concerned with

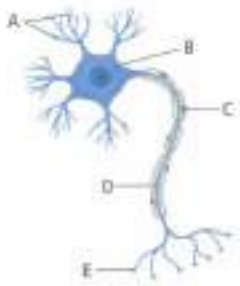
a) controlling rapid muscular activities b) learning in early stages

c) maintaining posture, orientation and equilibrium of body d) all of these.

39. Two neurons, A and B, synapse onto a third neuron, C. If neurotransmitter from A opens ligand-gated channels permeable to Na^+ and K^+ and neurotransmitter from B opens ligand-gated Cl^- channels, which of the following statements is true?
- An action potential in neuron A causes a depolarisation in neuron B.
 - An action potential in neuron B causes a depolarisation in neuron C.
 - Simultaneous action potentials in A and B will cause hyperpolarisation of neuron C.
 - Simultaneous action potentials in A and B will cause less depolarisation of neuron C than if only neuron A fired an action potential.
40. During depolarisation, the outer surface of the membrane becomes
- negatively charged
 - positively charged
 - neutrally charged
 - none of these.
41. The point in eye of mammals from which optic nerves and blood vessels leave the eye ball is called
- yellow spot
 - blind spot
 - pars optica
 - green spot
42. Eustachian tube is a passage connecting the
- inner ear with pharynx
 - eye with nose
 - middle ear with pharynx
 - middle ear with eye
43. **Assertion:** The PNS comprises of all the nerves of the body associated with CNS
Reason: PNS is the site of information processing and control.
- If both assertion and reason are true and reason is the correct explanation of assertion.
 - If both assertion and reason are true but reason is not the correct explanation of assertion.
 - If assertion is true but reason is false.
 - If both assertion and reason are false
44. Wax gland present in the ear canal is called:
- sweat gland
 - prostate gland
 - cowper's gland
 - sebaceous gland/ceruminous gland.
45. Following is a list of the events (in a random order) that lead to the formation of an auditory impulse.
- Vibration is transferred from the malleus to the incus to the stapes.
 - Basilar membrane moves up and down.
 - Nerve impulse is transmitted in cochlear nerve to auditory cortex of brain for impulse analysis and recognitions.
 - Sound waves pass through ear canal.
 - Stereocilia of hair cells of organ of Corti rub against tectorial membrane.
 - Sound waves cause ear drum to vibrate.
 - Nerve impulse is generated.
 - Vibrations move from fluid of vestibular canal to the fluid of tympanic canal.
 - Membrane at oval window vibrates.
- Which of the following options represents these events in a correct order?
- (iv), (vi), (i), (ix), (viii), (ii), (v), (vii), (iii)
 - (i), (ii), (iii), (iv), (v), (vi), (vii), (viii), (ix)
 - (ix), (viii), (vii), (vi), (v), (iv), (iii), (ii), (i)
 - (iv), (vi), (i), (viii), (ix), (ii), (v), (vii), (iii)
46. Which of the following parts of brain constitute the brain stem?

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- a) Midbrain and hindbrain b) Hindbrain and forebrain c) Forebrain and midbrain
d) Forebrain only
47. The size of pupil is controlled by the
a) ciliary muscles b) suspensory ligaments c) cornea d) iris muscles
48. **Assertion :** When all the three types of cones are stimulated equally, a mosaic of red, green and blue lights is produced.
Reason: Cones are responsible for twilight or scotopic vision.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
49. Acute vision is present in _____
a) vulture b) shark c) bat d) frog
50. The given figure shows the structure of a neuron. Select the option that correctly identifies the parts labelled as A to E.



a)

A	B	C	D	E
Nerve fibres	Cyton	Schwann cell	Node of Ranvier	Synaptic knob

b)

A	B	C	D	E
Dendrites	Cyton	Schwann cell	Node of Ranvier	Synaptic knob

c)

A	B	C	D	E
Dendrites	Nerve cell	Schwann cell	Synaptic knob	Node of Ranvier

d)

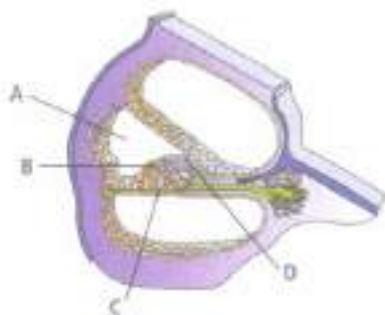
A	B	C	D	E
Axons	Cyton	Nerve cell	Node of Ranvier	Synaptic knob

51. The sensory receptors that respond to sound, develop receptor potentials when their:
a) hair are bent b) pigments absorb pressure
c) surface proteins are altered by a change in pH
d) sodium-potassium pumps become deactivated.
52. Match column I with column II and select the correct option from the given codes

Column I			Column II	
A.	Pinna	(i)	Collects vibrations in the air which produces sound	
B.	Ear canal	(ii)	Passage for sound wave from pinna to ear drum	
C.	Tympanic membrane	(iii)	Transfers sound wave to ear ossicles	
D.	Ear ossicles	(iv)	Increases the efficiency of transmission of sound waves to the inner ear	
E.	Cochlea	(v)	Has hearing receptors	

F.	Eustachian tube	(vi)	Equalises the pressure on both sides of ear drum
G.	Auditory nerves	(v)	Impulse transfer from organ of Corti to auditory cortex in temporal lobe of cerebrum

- a) A-(i), B-(ii), C-(iii), D-(iv), E-(v), F-(vi), G-(vii)
b) A-(vii), B-(vi), C-(v), D-(iv), E-(iii), F-(ii), G-(i)
c) A-(i), B-(ii), C-(iv), D-(iii), E-(v), F-(vi), G-(vii)
d) A-(i), B-(ii), C-(iii), D-(iv), E-(v), F-(vii), G-(vi)
53. The innermost layer of the human eye is
a) choroid b) cornea c) sclera d) retina.
54. Sensitive pigmented layer of eye is _____
a) cornea b) retina c) sclerotic d) iris
55. In humans, visceral organs are innervated by _____
a) sympathetic nerves and are under conscious control
b) parasympathetic nerves and are under conscious control c) Both (a) and (b)
d) both sympathetic and parasympathetic nerves but are not under conscious control
56. Bony labyrinth IS filled with a fluid called:
a) endolymph b) perilymph c) hololymph d) juxtalymph.
57. The black pigment in the eye, which reduces the internal reflection, is located in
a) retina b) iris c) sclerotic d) cornea.
58. The roof of the cranium of frog is formed by _____.
a) parasphenoid b) alisphenoid c) frontoparietal d) orbitosphenoid
59. A gymnast is able to balance his body upside down even in the total darkness because of _____.
a) Vestibular apparatus b) Tectorial membrane c) Organ of Corti d) Cochlea
60. Which one of the following transmits impulses to central neural system?
a) Abducen nerve b) Trochlear nerve c) Oculomotor nerve d) Auditory nerve
61. Human body temperature is maintained by
a) hypothalamus b) medulla oblongata c) pituitary d) cerebral cortex.
62. What is the space between arachnoid and piamater called?
a) Supra-arachnoid space b) Sub-arachnoid space c) Subdural space d) Meninges
63. Identify the parts labelled as A, B, C and D in the given figure and match the correct names from the list (i-viii) given below.



- (i) Reissner's membrane (ii) Basilar membrane (iii) Tectorial membrane (iv) Organ of Corti
(v) Hair cells (vi) Otolith organ (vii) Scala media (viii) Scala vestibuli

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A B C D

A B C D

A B C D

A B C D

a) (ii) (v) (iii) (i) b) (vii) (iv) (ii) (iii) c) (vii) (iv) (i) (ii) d) (viii) (vi) (i) (iii)

64. Cell bodies of neurons bringing afferent information into the spinal cord are located in:

a) dorsal root ganglia b) ventral root ganglia c) grey matter of the spinal cord
d) white matter of the spinal cord

65. Receptor sites for neuro transmitters are present on _____

a) Pre-synaptic membrane b) lips of axons c) Post synaptic membrane
d) Membrane of synaptic vesicles

66. Match the following columns and select the correct option

Column I		Column II	
a	Organ of Corti	i	Connects middle ear and pharynx
b	Cochlea	ii	Coiled part of the labyrinth
c	Eustachian tube	iii	Attached to the oval window
d	Stapes	iv	Located on the basilar membrane

a)

a	b	c	d
iv	ii	i	iii

b)

a	b	c	d
i	ii	iv	iii

c)

a	b	c	d
ii	iii	iv	i

d)

a	b	c	d
iii	i	iv	ii

67. Read the given paragraph. In the resting state, the axonal membrane is (i) with more (ii) charged ions outside than inside. This unequal distribution of ions is due to (1) the selective permeability of the membrane, which forms an almost impenetrable barrier to (iii) and (2) the action of the (iv), which pumps (v) Na^+ out of the neuron for every (vi) K^+ brought in. Select the option that correctly fills the blanks in the paragraph.

a)

(i)	(ii)	(iii)	(iv)	(v)	(vi)
depolarised	positively	Na^+	sodium-potassium pump	three	two

b)

(i)	(ii)	(iii)	(iv)	(v)	(vi)
depolarised	negatively	Na^+	sodium-potassium pump	three	two

c)

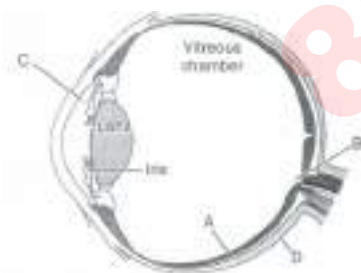
(i)	(ii)	(iii)	(iv)	(v)	(vi)
polarised	negatively	Na^+	sodium-potassium pump	three	two

d)

(i)	(ii)	(iii)	(iv)	(v)	(vi)
polarised	positively	Na^+	sodium-potassium pump	three	two

68. An investigator places an isolated neuron in a calcium free medium, gives the neuron a suprathreshold stimulus and then performs an assay to test whether neurotransmitter is released into the medium. Which of the following outcomes would you predict?

- a)
No neurotransmitter is detected since influx of calcium into the synaptic knob is required for neurotransmitter release.
- b)
No neurotransmitter is detected since influx of calcium is required in order for the neuron to conduct an action potential.
- c)
Neurotransmitter is detected since calcium is not required for action potential conduction and the initial stimulus was suprathreshold.
- d)
We cannot predict the outcome without knowing whether the neuron was myelinated or not.
69. Cornea is covered externally by a thin transparent membrane which is called
a) sclerotic b) conjunctiva c) choroid d) none of these
70. Which correctly describes a step in auditory signal transduction?
a)
Displacement of the basilar membrane with respect to the tectorial membrane stimulates stereocilia on the hair cells.
- b)
Pressure waves on the oval window cause vibrations of the malleus, which are transferred via the stapes to the round window.
- c)
Movement of the stapes causes oscillations in the tympanic membrane, which is in contact with the endolymph.
- d)
Oscillations of the stapes against the oval window set up pressure waves in the semicircular canals.
71. Parts A, B, C and D of the human eye are shown in the diagram. Select the option which gives correct identification along with its functions/characteristics.



- a) A- Retina - contains photoreceptors - rods and cones.
- b) B- Blind spot - has only few rods and cones.
- c) C - Aqueous chamber - reflects the light which does not pass through the lens .
- d) D - Choroid - its anterior part forms ciliary body.
72. Photosensitive compound in the human eye is made up of :
a) Opsin and retinal b) Opsin and retinol c) Transducin and retinene
d) Guanosine and retinol
73. For good reflex actions we require intact
a) spinal cord b) medulla oblongata c) hypothalamus d) cerebellum.

74. Which of the following options correctly identifies the effect of sympathetic and parasympathetic neural system on given features or organs?

a)

Feature/organ	Sympathetic neural system	Parasympathetic neural system
Salivary glands	Stimulates secretion	Inhibits secretion

b)

Feature/organ	Sympathetic neural system	Parasympathetic neural system
Pupil of the eye	Dilates	Constricts

c)

Feature/organ	Sympathetic neural system	Parasympathetic neural system
Heart rate	Decreases	Increases

d)

Feature/organ	Sympathetic neural system	Parasympathetic neural system
Intestinal peristalsis	Stimulates	Inhibits

75. Path taken in the eye ball by light rays is

a)

cornea → conjunctiva → aqueous humour → lens (through pupil) → vitreous humour → retina

b)

conjunctiva → cornea → lens (through pupil) → aqueous humour → vitreous humour → retina

c)

conjunctiva → cornea ~ vitreous humour → lens (through pupil) → aqueous humour → retina

d)

conjunctiva → cornea → aqueous humour → lens (through pupil) → vitreous humour → retina

76. The given diagram shows axon terminal and synapse. Here A, B, C, D and E respectively represent



a) Axon terminal, Synaptic cleft, Synaptic vesicles, Neurotransmitters and Receptors

b) Axon terminal, Synaptic vesicles, Synaptic cleft, Receptors and Neurotransmitters

c) Synaptic cleft, Synaptic vesicles, Axon terminal, Neurotransmitters and Receptors

d) Synaptic cleft, Axon terminal, Synaptic vesicles, Neurotransmitters and Receptors

77. A typical value of resting membrane potential is
a) - 100 mV b) - 70 mV c) - 40 mV d) - 60 mV
78. What is the correct path of a reflex arc?
a) Sensory stimulus → Dendrite → Axon
b) Motor nerves → Acetylcholine → Adjustor neuron
c) Efferent nerves → Connector nerves → Motor nerves
d) Afferent nerves → Efferent nerves → Connector nerves
79. Which one of the following does not act as a neuro-transmitter?
a) Cortisone b) Acetylcholine c) Dopamine d) Norepinephrine
80. Read the given statements and select the incorrect one.
a) In Hydra, all neurons are similar and join to form a nerve net.
b)
In earthworms, nervous system consists of a dorsal nerve cord, paired ganglia and segmental nerves.
c) Brain is present in insects.
d) Planaria has two nerve cords that join to form rudimentary brain
81. During the propagation of a nerve impulse, the action potential results from the movement of _____
a) K^+ ions from extracellular fluid to intracellular fluid
b) Na^+ ions from intracellular fluid to extracellular fluid
c) K^+ ions from intracellular fluid to extracellular fluid
d) Na^+ ions from extracellular fluid to intracellular fluid
82. **Assertion** : Choroid layer is thick over the posterior two-third of the eye ball but it becomes thin in the anterior part.
Reason : Choroid layer lacks blood vessels. It forms ciliary body in the anterior part of the eye ball.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
83. 'Pons' connects the
a) two cerebral hemispheres b) two lobes of cerebellum c) cerebrum and cerebellum
d) spinal cord with the brain.
84. In the chemistry of vision in mammals, the photosensitive substance is called _____
a) sclerotin b) retinal c) rhodopsin d) melanin
85. **Assertion**: Association areas are neither clearly sensory nor motor in function.
Reason: Association areas are responsible for complex functions like intersensory associations, memory and communication.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

86. **Assertion:** The resting membrane of the neuron exhibits polarity of charges.

Reason: The outer surface of the axonal membrane possesses a negative charge while its inner surface becomes positively charged.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

87. Select the option that correctly matches the structures with its location and function.

a)

Structure	location	Function
Eustachian tube	Anterior part of internal ear	Equalises air pressure on either sides of tympanic membrane

b)

Structure	location	Function
Cerebellum	Midbrain	Controls respiration and gastric secretions

c)

Structure	location	Function
Hypothalamus	Forebrain	Controls body temperature, urge for eating and drinking

d)

Structure	location	Function
Blind spot	Near the place where optic nerve leaves the eye	Rods and cones are present but inactive here

88. During the transmission of nerve impulse through a nerve fibre, the potential on the inner side of the plasma membrane has which type of electric change?

a) First positive, then negative and continue to be positive

b) First negative, then positive and continue to be positive.

c) First positive, then negative and again back to positive

d) First negative, then positive and again back to negative

89. Why is it difficult to differentiate between red and green colour objects in dark or in night?

a) Rods work well only during daytime. b) Rods work well only during daytime.

c) Rods work well only during night time d) Cones work well only during night time.

90. CNS is mostly made of _____

a) motor, neurons and sensory neurons b) sensory neurons and association neurons

c) association neurons d) motor neurons and association neurons

91. Nissl bodies are mainly composed of _____

a) nucleic acids and SER b) DNA and RNA c) proteins and lipids

d) free ribosomes and RER

92. The transparent lens in the human eye is held in its place by _____.

a) smooth muscles attached to the iris b) ligaments attached to the iris

c) ligaments attached to the ciliary body d) smooth muscles attached to the ciliary body

93. Complete the following paragraph by selecting the option that gives correct sequence of words. When a stimulus is applied at a site on the polarised membrane, the membrane at that site becomes freely permeable to (i) ions. It causes rapid influx of (ii) ions leading to (iii) of the

membrane.

a)

(i)	(ii)	(iii)
Na ⁺	K ⁺	depolarisation

b)

(i)	(ii)	(iii)
K ⁺	K ⁺	depolarisation

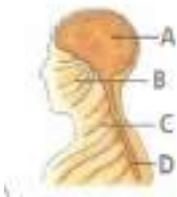
c)

(i)	(ii)	(iii)
K ⁺	Na ⁺	depolarisation

d)

(i)	(ii)	(iii)
Na ⁺	Na ⁺	depolarisation

94. Visceral nervous system comprises of
a) nerve fibres b) ganglia c) plexuses. d) All of these.
95. The thin elastic membrane covering the sensory hair cells of the ear is known as
a) Reissner's membrane b) tectorial membrane c) basilar membrane
d) neuro-sensory membrane
96. Which of the following is a part of our brain?
a) Corpora allata b) Corpora adiposa c) Corpora cardiaca d) Corpora quadrigemina
97. Which of the following cells are associated with identification of colours in bright light?
a) Cone cells b) Rod cells c) Lacrimal cells d) Cells of Muller
98. Which function will be lost if occipital lobe is damaged?
a) Hearing b) Speech c) Vision d) Memory
99. A small passage that permits continuity between scala vestibuli and scala tympani is
a) helicotrema b) Eustachian tube c) cochlea d) vestibule.
100. In the accompanying diagram of a part of the human body, the structures belonging to the central neural system are labelled as



- a) A and C b) B and C c) A and D d) C and D
101. In frog, 'fenestra ovalis' is _____
a) the opening in the auditory capsule which separates the middle ear from internal ear
b) the air-filled cavity of the middle ear
c) the communication between the pharynx and the tympanic cavity
d) the external opening of the tympanic cavity which is covered by the tympanic membrane
102. Which of the following statements is correct regarding cerebellum?
a) it is a part of hindbrain b) it consists of two cerebellar hemisphere and a vermis
c) Arbor vitae is present in cerebellum. d) All of these
103. The 3rd, 6th and 11th cranial nerves are respectively
a) oculomotor, abducens and accessory b) oculomotor, trigeminal and accessory
c) optic, facial and accessory d) trochlear, abducens and vagus.
104. Vagus nerve is _____
a) X b) IX c) VII d) V
105. Saltatory conduction of impulse occurs in:
a) liver cells b) non-myelinated nerve fibres c) myelinated nerve fibres d) none of these

106. **Assertion :** The Eustachian tube helps in equalising the pressures on either sides of the ear drum.

Reason: The Eustachian tube connects the middle ear cavity with the pharynx.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

107. The part of the ear where sound is transduced is

a) tympanic membrane b) ear ossicles c) semicircular canals d) cochlea

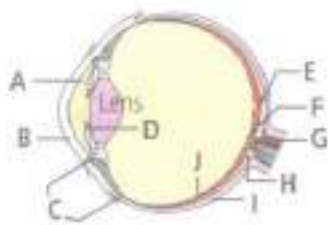
108. Refer to the given diagram. Match the labelled parts (A- J) with their functions and select the correct option.

(i) Carries nerve signals to the brain

(ii) Regulates the size of the pupil to let more or less light into the eye

(iii) Changes the shape of the lens

(iv) Photoreceptors are concentrated at this point



a) (i)-B, (ii)-D, (iii)-F, (iv)-H b) (i)- J, (ii)-G, (iii)-I, (iv)-C c) (i)-A, (ii)-C, (iii)-E, (iv)-G

d) (i)-G, (ii)-D, (iii)-C, (iv)-E

109. Choose the correct statement:

a) No receptors respond to changes in pressure

b) Meissner's corpuscles are thermoreceptors

c)

Photoreceptors in the human eye are depolarised during darkness and become hyperpolarised in response to the light stimulus

d) Receptors do not produce graded potentials

110. Vagus nerve effects

a) voice production b) peristalsis c) respiratory movements d) all of these.

111. The Broca's area and Wernicke's centre are the association areas situated in cerebrum. These are associated with

a) breathing b) blind spot c) memory d) none of these

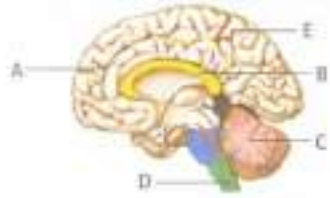
112. Alzheimer disease in humans is associated with the deficiency of _____

a) glutamic acid b) acetylcholine c) gamma aminobutyric acid (GABA) d) dopamine

113. The organ of Corti is a structure present in

a) external ear b) middle ear c) semicircular canal d) cochlea.

114. The given figure shows lateral view of the human brain. Identify the parts labelled as A to E and select the correct option



a)

A	B	C	D	E
Temporal lobe	Corpus callosum	Cerebellum	Medulla oblongata	Frontal lobe

b)

A	B	C	D	E
Frontal lobe	Thalamus	Cerebrum	Medulla oblongata	Occipital lobe

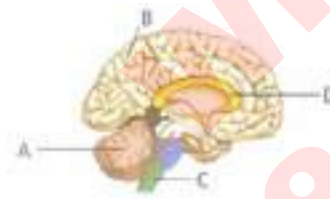
c)

A	B	C	D	E
Temporal lobe	Pons	Cerebrum	Medulla oblongata	Frontal lobe

d)

A	B	C	D	E
Frontal lobe	Corpus callosum	Cerebellum	Medulla oblongata	Parietal lobe

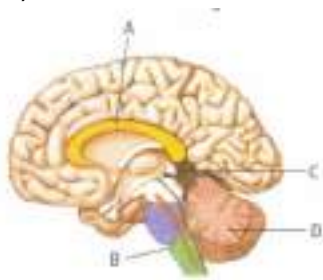
115. An area in the brain which is associated with strong emotions is
a) cerebral cortex b) cerebellum c) limbic system d) medulla.
116. Function of iris is to _____
a) move lens forward and backward b) refract light rays
c) bring about movements of eyelids d) alter the size of pupil
117. Which labelled part controls the process of breathing?



a) A b) B c) C d) D

118. Mark the vitamin present in rhodopsin
a) Vit. A b) Vit. B c) Vit. C d) Vit. D
119. Which of the following cranial nerves of man is both sensory and motor?
a) Olfactory b) Optic c) Vagus d) Oculomotor
120. Which of the following options correctly describes the sequence of structures present between a receptor and an effector when D refers dendrite, A refers axon, S refers synapse and CB refers to cell body?
a) D - CB - A - S - D - CB - A b) A - D - CB - S - A - D - CB c) D - C B - A - S - A - C B - D
d) D-A-S-CB-D-A-C- D- A-CB
121. In a medullated nerve fibre, the conduction of impulse is faster due to the presence of:
a) pericytes b) endoneurium and epineurium c) myelin sheath and nodes of Ranvier
d) Nissl's granules.
122. Injury to vagus nerve in humans is not likely to affect _____

- a) tongue movements b) gastrointestinal movements c) pancreatic secretion
d) cardiac movements
123. The respiratory and cardiac centres are located in
a) cerebrum b) diencephalon c) crura cerebri d) medulla oblongata.
124. Satiety centres of brain are present in
a) cerebral hemisphere b) hypothalamus c) cerebellum d) medulla oblongata.
125. **Assertion:** The space between the cornea and the lens is called the vitreous chamber.
Reason: The space between the lens and retina is called the aqueous chamber.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
126. The shape of eye lens is changed by
a) pupil b) iris c) optic nerve d) ciliary muscle
127. Depolarisation of axolemma during nerve conduction takes place because:
a) equal amount of Na^+ and K^+ move out across axolemma b) only Na^+ move inside
c) more Na^+ moves outside than K^+ moving outside d) none of these
128. Anterior choroid plexus is present on the
a) floor of diencephalon b) cerebral hemispheres c) roof of diencephalon
d) roof of medulla oblongata
129. The human hind brain comprises three parts, one of which is _____
a) Spinal cord b) Corpus callosum c) Cerebellum d) Hypothalamus
130. Which of the following structures of regions is incorrectly paired with its function?
a) Medulla oblongata controls respiration and cardiovascular reflexes
b) Corpus callosum band of fibers connecting left and right cerebral hemispheres.
c)
Hypothalamus production of releasing hormones and regulation of temperature, hunger and thirst.
d)
Limbic system consists of fibre tracts that interconnect different regions of brain; controls movement.
131. Following is the figure of a sagittal section of a human brain. Match the labelled parts with the respective statements given below and select the correct option.
(i) Consists of fibre tracts that interconnect left and right hemispheres
(ii) Secretes a hormone melatonin
(iii) Alcohol interferes with the function of this part
(iv) Contains centres which control respiration, cardiovascular reflexes and gastric secretions



a)	b)	c)	d)																																
<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(ii)</td><td>(iii)</td><td>(i)</td><td>(iv)</td></tr></table>	A	B	C	D	(ii)	(iii)	(i)	(iv)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iv)</td><td>(i)</td><td>(iii)</td><td>(ii)</td></tr></table>	A	B	C	D	(iv)	(i)	(iii)	(ii)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iii)</td><td>(ii)</td><td>(iv)</td><td>(i)</td></tr></table>	A	B	C	D	(iii)	(ii)	(iv)	(i)	<table border="1"><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(i)</td><td>(iv)</td><td>(ii)</td><td>(iii)</td></tr></table>	A	B	C	D	(i)	(iv)	(ii)	(iii)
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A	B	C	D																																
(iii)	(ii)	(iv)	(i)																																
A	B	C	D																																
(i)	(iv)	(ii)	(iii)																																

132. The balancing organ of ear is
 a) lagena and sacculus b) semicircular canal and utriculus
 c) semicircular canal and ossicles d) otolith and lagena.
133. Which of the following is a correct match of ear part and its function?
 a) Organ of Corti - Increases the efficiency of sound waves
 b) Eustachian tube - Maintains body balance and posture
 c) Tectorial membrane - Determines patterns of vibration of sound waves
 d) Semicircular canal - Equalises the pressure on either sides of the ear drum
134. The part of internal ear responsible for hearing is
 a) cochlea b) semicircular canal c) utriculus d) sacculus.
135. Which one of the following statements is not correct?
 a) Retinal is the light absorbing portion of visual photo pigments.
 b)
 In retina the rods have the photopigment rhodopsin while cones have three different photopigments.
 c) Retinal is a derivative of Vitamin C.
 d) Rhodopsin is the purplish red protein present in rods only.
136. Light rays entering the eye are conkolled by _____
 a) pupil b) iris c) cornea d) lens
137. Comprehension of spoken and written words take place in the region of
 a) association area b) motor area c) Wernicke's area d) Broca's area.
138. Read the following five statements (i) to (v) regarding left cerebral hemisphere and select the option that correctly states the true (T) and false (F) statements. (i) It receives most modalities of sensory information from the right side of the body.
 (ii) It is usually larger than the right cerebral hemisphere.
 (iii) It is the dominant cerebral hemisphere in most individuals.
 (iv) It is connected to the right cerebral hemisphere by the corpus callosum.
 (v) It contains the main areas for the understanding and production of speech in most individuals.

a)

(i)	(ii)	(iii)	(iv)	(v)
T	T	F	F	F

b)

(i)	(ii)	(iii)	(iv)	(v)
F	T	T	F	T

c)

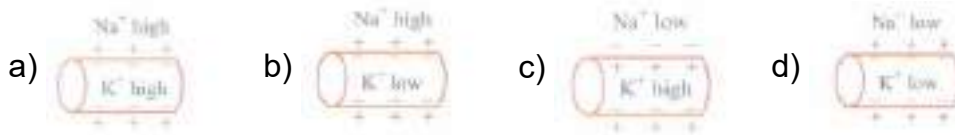
(i)	(ii)	(iii)	(iv)	(v)
T	F	T	T	T

d)

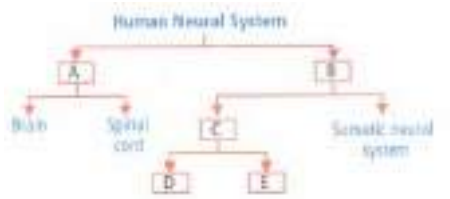
(i)	(ii)	(iii)	(iv)	(v)
F	F	T	T	T

139. Blind spot in vertebrate eye is the place where
 a) there are no cones b) there are no rods c) there are neither rods nor cones
 d) retina is absent
140. Which cranial nerve has the highest number of branches?
 a) Facial nerve b) Trigeminal c) Vagus nerve d) None of these
141. Tree of life is
 a) branchial tree b) lymphatic system c) arbor vitae d) loop of Henle

142. Which of the following is an example of conditioned reflex?
- Hand withdraws when pierced with a needle
 - Eyes close, when anything enters into them
 - During digestion, food goes forward in alimentary canal
 - Trained dog salivates when you ring a bell
143. In which animal, nerve cell is present but brain is absent?
- Sponge
 - Honeybee
 - Cockroach
 - Hydra
144. When a neuron is in resting state, i.e., not conducting any impulse, then axonal membrane is :
- Comparatively more permeable to Na^+ ions and nearly impermeable to K^+ ions
 - Equally permeable to both Na^+ and K^+ ions
 - Impermeable to both Na^+ and K^+ ions
 - Comparatively more permeable to K^+ ions and nearly impermeable to Na^+ ions
145. Which of the following cranial nerves can regulate heartbeat?
- X
 - IX
 - VII
 - VI
146. Read the given statements and select the correct ones.
- Autonomic neural system transmits impulses from the CNS to the voluntary organs and striated muscles of the body.
 - Unmyelinated nerve fibres do not have Schwann cells which form the myelin sheath.
 - Axonal membrane of a neuron while not conducting any impulse is comparatively more permeable to potassium ions (K^+) than to sodium ions (Na^+).
 - A synapse is formed by the membranes of a presynaptic neuron and a post synaptic neuron.
- (i) and (ii)
 - (ii) and (iii)
 - (iii) and (iv)
 - (i) and (iv)
147. Which of the following pairs correctly identifies function of parasympathetic nervous system?
- Slows heartbeat, promotes pancreatic secretion
 - Increases secretion of sweat gland and intestinal gland
 - Accelerates heartbeat, dilates arteries
 - Raises blood pressure, increases peristaltic activity
148. Skeletal muscles are controlled by
- sympathetic nerves
 - parasympathetic nerves
 - somatic nerves
 - autonomic nerves.
149. **Assertion:** Medulla contains centres which control respiration, cardiovascular reflexes and gastric secretions
- Reason:** Medulla contains several neurosecretory cells which secrete hormones.
- If both assertion and reason are true and reason is the correct explanation of assertion.
 - If both assertion and reason are true but reason is not the correct explanation of assertion.
 - If assertion is true but reason is false.
 - If both assertion and reason are false.
150. Olfactory receptors are present in
- eye
 - nose
 - ear
 - skin
151. Which of the following options illustrates the distribution of Na^+ and K^+ ions in a section of non-myelinated axon which is at resting potential?



152. The flow chart given here shows functional organisation of the human neural system. Identify A to E and select the correct option.



a)

A	B	C	D	E
PNS	CNS	ANS	Sympathetic neural system	Parasympathetic neural system

b)

A	B	C	D	E
ANS	CNS	PNS	Parasympathetic neural system	Sympathetic neural system

c)

A	B	C	D	E
CNS	PNS	ANS	Sympathetic neural system	Parasympathetic neural system

d)

A	B	C	D	E
ANS	PNS	CNS	Parasympathetic neural system	Sympathetic neural system

153. **Assertion:** Myelinated nerve fibres are present in spinal and cranial nerves.

Reason: Myelinated nerves conduct impulses more rapidly than unmyelinated nerves.

a) If both assertion and reason are false.

b) If both assertion and reason are true and reason is the correct explanation of assertion.

c) If both assertion and reason are true but reason is not the correct explanation of assertion.

d) If assertion is true but reason is false.

154. Which part of human brain is concerned with the regulation of body temperature?

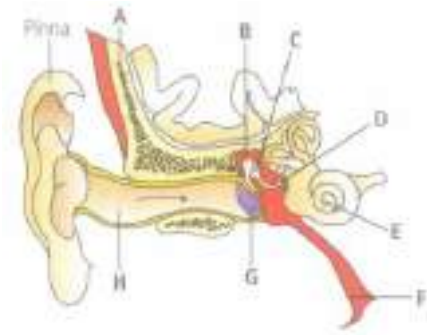
a) Cerebellum b) Cerebrum c) Hypothalamus d) Medulla Oblongata

155. While travelling to higher altitudes, people can feel pain in the ear and dizziness. Which part, among the following is involved?

a) Cochlea, ear ossides b) Tympanic membrane

c) Eustachian tube, utricle, saccule and semicircular canals d) None of the above

156. A diagram of ear is given here. Identify the parts A to H and select the correct option



a)

A - Temporal bone, B - Malleus, C - Incus, D - Stapes, E - Cochlea, F - Eustachian tube, G- Tympanic membrane, H- External auditory canal

b)

A - Tympanic membrane, B - Malleus, C - Incus, D - Stapes, E - Cochlea, F- Eustachian tube, G - Temporal bone, H- External auditory canal

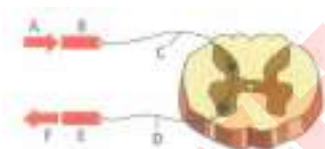
c)

A- Tympanic membrane, B - Incus, C - Malleus, D - Stapes, E - Cochlea, F - Eustachian tube, G - Temporal bone, H - External auditory canal

d)

A - Temporal bone, B - Malleus, C - Incus, D - Cochlea, E - Stapes, F - Eustachian tube, G- Tympanic membrane, H- External auditory canal

157. The path of reflex arc is shown in the given figure. identify the different labellings A, B, C, D, E, F and select the correct option.



a)

A	B	C	D	E	F
Stimulus	Effector	Sensory nerve	Motor nerve	Receptor	Response

b)

A	B	C	D	E	F
Stimulus	Receptor	Sensory nerve	Motor nerve	Effector	Response

c)

A	B	C	D	E	F
Stimulus	Effector	Motor nerve	Sensory nerve	Receptor	Response

d)

A	B	C	D	E	F
Stimulus	Receptor	Motor nerve	Sensory nerve	Effector	Response

158. The depression in the retina of eye which lodges only the cones is called

- a) blind spot b) fovea centralis c) fenestra rotunda d) red nuclei.

159. In a human being, the number of spinal nerves is:
a) 31 pairs b) 52 pairs c) 12 pairs d) 36 pairs
160. Macula maintains
a) static equilibrium b) dynamic equilibrium c) both (a) and (b) d) none of these.
161. Which of the following statements is correct?
a) Cornea consists of dense connective tissue of elastin and can repair itself
b) Cornea is convex, transparent layer which is highly vascularised
c) Cornea consists of dense matrix of collagen and is the most sensitive portion of the eye
d) Cornea is an external, transparent and protective proteinaceous covering of the eye-ball
162. Cornea transplantation is outstandingly successful because _____
a) cornea is easy to preserve
b) cornea is not linked up with blood vascular and immune systems
c) the technique involved is very simple d) cornea is easily available
163. In a man, abducens nerve is injured. Which one of the following functions will be affected?
a) Movement of the eye ball b) Movement of the tongue c) Swallowing
d) Movement of the neck
164. Potential difference across resting membrane is negatively charged. This is due to differential distribution of the following ions.
a) Na^+ and K^+ ions b) CO_3^{3+} and Cl^- ions c) Ca^{++} and Mg^{++} ions d) Ca^{+4} and Cl^- ions
165. The part of human hindbrain that is responsible for hand-eye coordination is
a) cerebellum b) pons varolii c) medulla oblongata d) thalamus.
166. Sense of smell is perceived by
a) occipital lobe b) temporal lobe c) olfactory lobe d) parietal lobe.
167. Characteristic feature of human cornea _____
a) Secreted by conjunctiva and glandular b) It is lacrimal gland which secretes tears
c) Blood circulation is absent in cornea
d) In old age it becomes harden and white layer deposits on it which causes cataract
168. If a patient suffers a stroke that destroys the optic tract on the right side of the brain, which of the following visual defects will result?
a) There will be no vision in the left eye, but vision will be normal in the right eye
b)
The patient will not perceive images of objects striking the left half of the retina in the left eye
c)
The patient will not perceive images of objects striking the right half of the retina in the right eye.
d) Neither eye will perceive objects in the right side of the patient's field of view.
169. High frequency sound waves vibrate the basilar membrane
a) near the oval window b) near the helicotrema c) in the middle of cochlea
d) from oval window to helicotrema.
170. Broca's area in human brain controls
a) speech b) taste c) respiration d) heartbeat.

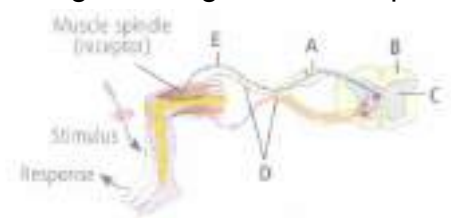
171. Read the given statements and select the correct option.

- (i) Synaptic cleft of neurons secretes adrenaline.
 - (ii) Myelinated nerve fibres are enveloped with Schwann cells, which form a myelin sheath around the axon.
 - (iii) Non-myelinated nerve fibre is enclosed by a Schwann cell that does not form a myelin sheath.
 - (iv) Spinal and cranial nerves are made of nonmyelinated nerve fibres.
- a) Statements (i) and (ii) are correct but statements (iii) and (iv) are incorrect.
 b) Statements (i), (ii) and (iii) are correct but statement (iv) is incorrect
 c) Statements (iii) and (iv) are correct but statements (i) and (ii) are incorrect.
 d) Statements (ii) and (iii) are correct but statements (i) and (iv) are incorrect.

172. Brain depends on blood for the supply of

- a) ATP and glucose b) oxygen and ATP c) oxygen and glucose d) oxygen and glucose

173. The given diagrammatic representation of reflex action shows knee jerk reflex.



Identify the parts labelled as A to E and select the correct option.

a)

A	B	C	D	E
Dorsal root ganglion	White matter	Grey matter	Afferent pathway	Efferent pathway

b)

A	B	C	D	E
Dorsal root ganglion	White matter	Grey matter	Efferent pathway	Afferent pathway

c)

A	B	C	D	E
Ventral root ganglion	Grey matter	White matter	Efferent pathway	Afferent pathway

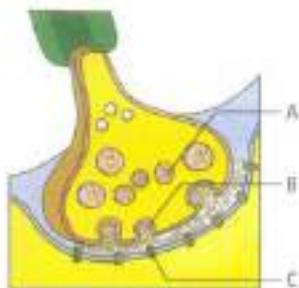
d)

A	B	C	D	E
Ventral root ganglion	White matter	Grey matter	Efferent pathway	Afferent pathway

174. Destruction of the anterior horn cell of the spinal cord would result in loss of _____.

- a) voluntary motor impulses b) commissural impulses c) integrating impulses
 d) sensory impulses

175. The given diagram shows axon terminal. Select the option that correctly matches the steps in transmission of impulses (list i-vii) with the labellings (A - C) in diagram.



- (i) Chemicals called neurotransmitters are released in the synaptic cleft through ion channels.
- (ii) When an impulse arrives at the axon terminal, it stimulates the movement of synaptic vesicles.
- (iii) Neurotransmitters are endocytosed into the neurons.

- (iv) The ion channels close with the binding of neurotransmitters to their specific receptors vesicles.
- (v) Synaptic vesicles move towards the membrane where they fuse with the plasma membrane.
- (vi) Neurotransmitters are released in the synaptic cleft.
- (vii) The released transmitters bind to their specific receptors on post-synaptic membrane.

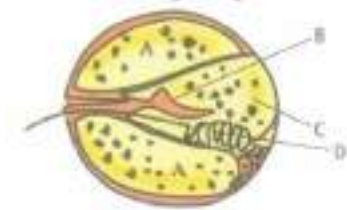
A B C A B C A B C A B C

- a) (ii) (iii) (i) b) (v) (vi) (iv) c) (ii) (vi) (vii) d) (v) (iii) (iv)

176. The fluid filled in the space between lens and cornea is termed as

- a) synovial fluid b) CSF. c) vitreous humour d) aqueous humour

177. A diagrammatic cross section of a single loop of human cochlea is shown in the given figure



Which one of the following options correctly represents the names of any three of the labelled parts?

- a) A-endolymph, B-tectorial membrane, D-sensory hair cells
- b) A-perilymph, B-tectorial membrane, C-endolymph
- c) B-tectorial membrane, C-perilymph, D-secretory cells
- d) A-serum, C-endolymph, D-sensory hair cells

178. Which of the following has H-shaped grey matter?

- a) Cerebrum b) Medulla oblongata c) Cerebellum d) Spinal cord

179. **Assertion :** The inner ear contains three ossicles (malleus, incus and stapes) which are attached to one another in a chain-like fashion.

Reason : The stapes is attached to the tympanic membrane and the malleus is attached to the oval window of the cochlea.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false. d) If both assertion and reason are false.

180. Sodium-potassium pump transports

- a) Na^+ and K^+ out of the neuron b) Na^+ and K^+ into the neuron
- c) Na^+ into the neuron and K^+ out of the neuron
- d) K^+ into the neuron and Na^+ out of the neuron.

181. Myelin sheath is formed by

- a) Ranvier cells b) muscle cells c) Schwann cells d) axon.

182. The junction between the axon of one neuron and the dendrite of the next is called

- a) junction point b) a synapse c) a joint d) constant bridge

183. Resting membrane potential is maintained by

- a) hormones b) neurotransmitters c) ion pumps d) none of the above

184. Iris is part of _____
 a) sclerotic b) choroid/uvula c) choroid and retina d) sclerotic and choroid
185. **Assertion:** Multipolar neurons have two or more axons and one dendrite.
Reason: Multipolar neurons are found usually in the embryonic stage.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
186. Which of the following structures is found in diencephalon?
 a) Pons b) Basal ganglia c) Corpora quadrigemina d) Hypothalamus
187. Which of the following statements is incorrect?
 a) Sympathetic neural system controls and coordinates organs which are under voluntary control.
 b) Deficiency of vitamin A can causes night blindness c) Malleus is the largest ear ossicle
 d) Cranial nerve IX is a mixed nerve
188. In mammalian eye, the 'fovea' is the center of the visual field, where _____.
 a) The optic nerve leaves the eye b) Only rods are Present
 c) More rods than cones are found d) High density of cones occur, but has no rods
189. Which part of the human ear plays no role in hearing as such but is otherwise very much required?
 a) Eustachian tube b) Organ of corti c) Vestibular apparatus d) Ear ossicles
190. Match column I with column II and select the correct option from the codes given below.
- | | Column I | | Column II |
|----|--------------|-------|---------------------------------|
| A. | Cerebrum | (i) | Controls the pituitary |
| B. | Cerebellum | (ii) | Controls vision and hearing |
| C. | Hypothalamus | (iii) | Controls the rate of heart beat |
| D. | Midbrain | (iv) | Seat of intelligence |
| | | (v) | Maintains body posture |
- a) A-(v), B-(iv), C-(ii), D-(iii) b) A-(iv), B-(v), C-(ii), D-(i) c) A-(v), B-(iv), C-(i). D-(iii)
 d) A-(iv), B-(v), C-(i), D-(ii)
191. Afferent nerve fibres carry impulses from _____
 a) effector organs to CNS b) receptors to CNS c) CNS to receptors d) CNS to muscles
192. Sympathetic nervous system induces _____
 a) heart beat b) secretion of digestive juices c) secretion of saliva d) All of the above
193. **Assertion:** Reflex arc comprises of at least one afferent neuron, one efferent neuron and a part of PNS.
Reason: The efferent neuron receives signal from a sensory organ and transmits the impulse via a ventral nerve root into the PNS.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.

194. The function of our visceral organs is controlled by
a) sympathetic and somatic neural system
b) sympathetic and parasympathetic neural system c) central and somatic neural system
d) none of the above
195. Neurons in sponges are
a) unipolar b) bipolar c) multipolar d) absent.
196. Myelin sheath is produced by _____
a) Astrocytes and Schwann cells b) Oligodendrocytes and Osteoclasts
c) Osteoclasts and AskocYtes d) Schwann cells and Oligodendrocltes
197. Which of the following cranial nerves has the highest number of branches?
a) Vagus nerve b) Trigeminal nerve c) Facial nerve d) None of these
198. A nerve fibre during resting stage is
a) more permeable to Na^+ b) more permeable to K^+ c) equally permeable for Na^+ and K^+
d) less permeable to K^+
199. Internal ear is filled with
a) perilymph b) endolymph c) lymph d) both (a) and (b).
200. The sympathetic nerves, in mammals arise from _____
a) sacral neryes b) cervical nerves c) thoraco-lumbar nerves
d) III, VII, IX and X cranial nerves
201. Which part of the brain is responsible for thermoregulation?
a) Hypothalamus b) Corpus callosum c) Medulla oblongata d) Cerebrum
202. A list of events occurring in the transmission of nerve impulse across the synapse is given below in a random order.
(i) Opening of specific ion channels allows the entry of ions, a new action potential is generated in the post-synaptic neuron.
(ii) Neurotransmitter binds to the receptor on post synaptic membrane.
(iii) Synaptic vesicle fuses with pre-synaptic membrane, neurotransmitter release into synaptic cleft.
(iv) Depolarisation of pre-synaptic membrane.
(v) Arrival of action potential at axon terminal.
Which of the following options represents these events in a correct order?
a) (v) \rightarrow (iv) \rightarrow (iii) \rightarrow (ii) \rightarrow (i) b) (i) \rightarrow (ii) \rightarrow (iii) \rightarrow (iv) \rightarrow (v)
c) (i) \rightarrow (ii) \rightarrow (iv) \rightarrow (iii) \rightarrow (v) d) (v) \rightarrow (iv) \rightarrow (iii) \rightarrow (i) \rightarrow (ii)
203. **Assertion:** Vestibular apparatus helps us in maintaining balance of body and posture
Reason : Due to the arrangement of semicircular canals of vestibular apparatus, movement of head in any direction will stimulate sensory cells to maintain dynamic equilibrium.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
204. All sensory information to be registered consciously by the forebrain must pass via the:
a) thalamus b) reticular activating system c) cerebellum d) pons
205. Ivan Pavlov performed experiments on _____

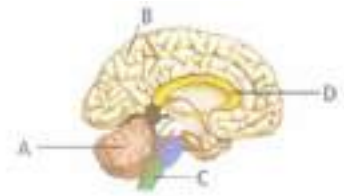
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a) simple reflexes b) conditioned reflexes c) cardiac reflexes d) origin of life

206. The optic lobes in humans are represented by the corpora

a) bigemina b) arenacea c) striata d) quadrigemina.

207. Which of the following functions is performed by the part labelled 'C' in the given figure?



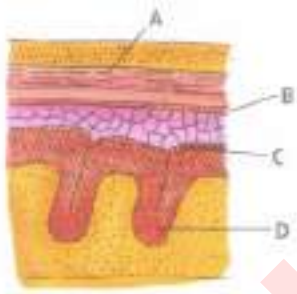
a) Regulation of body temperature b) Regulation of gastric secretions c) Learning
d) Maintaining posture

208. The primary visual area is located in

a) temporal lobe b) occipital lobe c) frontal lobe d) parietal lobe.

209. The given figure shows a section of brain. Identify the parts labelled as A, B, C and D and match them with the names (i - vii) given below.

(i) Arachnoid membrane (ii) Subdural space (iii) Duramater (iv) Bone (v) White matter (vi) Grey matter (vii) Piamater



a)

A	B	C	D
(iii)	(ii)	(vi)	(v)

b)

A	B	C	D
(i)	(ii)	(iii)	(vi)

c)

A	B	C	D
(iii)	(i)	(vii)	(vi)

d)

A	B	C	D
(iv)	(vii)	(i)	(ii)

210. The light striking the retina generates nerve impulse. Which of the following options correctly describes the path of light?

a) Photosensory cells → Bipolar neurons → Ganglionic cells → Sensory nerves

b) Sensory nerves → Bipolar neurons → Ganglionic cells → Photosensory cells

c) Sensory nerves → Ganglionic cells → Bipolar neurons → Photosensory cells

d) Photosensory cells → Ganglionic cells → Bipolar neurons → Sensory nerves



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Time : 1 Mins

CHEMICAL COORDINATION AND INTEGRATION 1

Marks : 911

- Which of the following is under the direct control of neurosecretory cells?
a) Pars distalis and pars intermedia b) Pars intermedia and pars nervosa
c) Pars nervosa only d) Pars distalis only
- Which hormones do stimulate the production of pancreatic juice and bicarbonate?
a) Angiotensin and epinephrine b) Gastrin and insulin c) Cholecystokinin and secretin
d) Insulin and glucagon
- The hormone which promotes protein anabolism, absorption of calcium from the bowel and retards use of blood glucose for ATP production
a) Melatonin b) Adrenaline c) Growth hormone d) Insulin
- Cortisol is secreted from
a) pancreas b) thyroid c) adrenal d) thymus
- Which one of the following pairs of organs includes only the endocrine glands?
a) Parathyroid and Adrenal b) Pancreas and Parathyroid c) Thymus and Testes
d) Adrenal and Ovary
- Endocrine glands have _____ to carry their secretions to the specific organ.
a) capillaries b) tubules c) no ducts d) ducts
- Drug called 'Heroin' is synthesised by _____
a) acetylation of morphine b) glycosylation of morphine c) nitration of morphine
d) methylation of morphine
- Neural coordination is
a) Fast and long lived b) Fast and short lived c) Slow and long lived
d) Slow and short lived
- Which part of body secretes the hormone secretion?
a) Stomach b) Oesophagus c) Ileum d) Duodenum
- The signal transduction of steroid hormone across cell is through
a)
binding of hormone to the cytoplasmic receptor and the complex binds to hormone response element on DNA within promoter DNA
b)
binding of hormone to the transmembrane receptor which initiates the production of second messenger that activates enzymes which further activates transcription factors

- c)
binding of hormone to the transmembrane receptor which diffuse inside the cell cytoplasm and then activates the enzyme necessary for the activation of transcription factors
- d)
binding of hormone to the cytoplasmic receptor that initiates the production of second messenger which activates enzymes that further activates transcription factors.
11. Low level of progesterone and estrogen in blood stimulate
a) FSH-RH production b) LH production c) GH production d) all of these
12. **Assertion:** Insulin stimulates glycogenolysis and gluconeogenesis resulting in hyperglycemia.
Reason: Prolonged hyperglycemia leads to complex disorder called diabetes insipidus.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
13. In which of the following gland(s), tissue mass is differentiated into cortex and medulla?
a) Adrenal b) Pituitary c) Thymus d) Both (1) &(3)
14. The given table enlists various hormones and their chemical nature. Select the option which completes the table.

Hormone	Chemical composition
(i)	Peptide
Testosterone	(ii)
Thyroxine	(iii)
(iv)	Amino-acid derivative

a)

(i)	(ii)	(iii)	(iv)
Cortisol	Steroid	Polypeptide	Estradiol

b)

(i)	(ii)	(iii)	(iv)
Oxytocin	Protein	Iodothyronine	Epinephrine

c)

(i)	(ii)	(iii)	(iv)
Cortisol	Protein	Amine	Estradiol

d)

(i)	(ii)	(iii)	(iv)
Oxytocin	Steroid	Iodothyronine	Epinephrine

15. Melatonin influences
a) Diurnal rhythm b) Menstrual cycle c) Defense capability d) All of these
16. Select the correctly matched pair.
a) Pineal gland - Does not influence menstrual cycle b) Corpus luteum - Secrete oxytocin
c) Interstitial cells - Erythropoietic
d) Cholecystokinin - Stimulates pancreatic enzyme secretions
17. Goitre is a pathological condition associated with
a) glucagon b) progesterone c) thyroxine d) testosterone
18. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Oxytocin	(i) Stimulates ovulation

B. Prolactin	(ii) Implantation and maintenance of pregnancy
C. Lutenising hormone	(iii) Milk production in mammary glands
D. Progesterone	(iv) Uterine contraction during labour
	(v) Reabsorption of water by nephrons

- a) A-(v), B-(iv), C-(i), D-(ii) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(iv), B-(iii), C-(i), D-(ii)
d) A-(v), B-(iii), C-(ii), D-(i)
19. With reference to the pituitary, which of the following statements is correct?
a) Neurohypophysis synthesise vasopressin and oxytocin
b) Adenohypophysis stores TSH and STH secreted by neurohypophysis.
c) Neurohypophysis collects and stores vasopressin and oxytocin.
d) Adenohypophysis secretes vasopressin and oxytocin.
20. Addition of a trace of thyroxine or iodine in water containing tadpoles will _____
a) keep them in larval stage b) hasten their metamorphosis
c) slow down their metamorphosis d) kill the tadpoles
21. **Assertion:** Melatonin influences the menstrual cycle, pigmentation and defense capability.
Reason: Melatonin plays an important role in the regulation of diurnal rhythm of our body.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
22. The function of pineal body is to
a) lighten the skin colour b) control sexual behaviour c) regulate the period of puberty
d) all of these.
23. Which one of the following statements is incorrect?
a) Glucagon is secreted by pancreas b) Androgens are produced by ovary
c) Thyroxine is secreted by thyroid d) Oxytocin is secreted by pituitary
24. Which of the following hormones is not released by pars distalis, in frog?
a) Growth hormone b) Prolactin c) Melanocyte stimulating hormone
d) Luteinizing hormone
25. Which of the following hormones is necessary for the development of secondary sexual characters in human beings?
a) Estrogen b) FSH c) Testosterone d) Both (a) and (c)
26. Pituitary gland is lodged in a bony cavity of which skull bone?
a) Temporal b) Occipital c) sphenoid d) Parietal
27. Increase in bleeding time and delay in blood coagulation is due to the deficiency of which hormone?
a) Adrenaline b) Noradrenaline c) Parathormone d) Thyroxine
28. In which of the following hormone(s) is/are responsible for maintaining corpus luteum?
a) LH b) Estrogen c) hCG d) Both (1) & (3)
29. Prolactin activates

- a) Growth of breasts and secretion of milk in mammary glands
b) Secondary sexual characters in males c) Melatonin secretion d) Estrogen secretion
30. Which of the following is incorrect about IDDM?
a) It commonly develops in younger people b) It is an autoimmune disorder
c) It results in deficiency of insulin d) It is due to less sensitivity of target cells to insulin
31. The posterior pituitary gland is not a true endocrine gland because:
a) It is provided with a duct b) it only stores and releases hormones
c) It is under the regulation of hypothalamus d) It secretes enzymes
32. Underproduction of hormones by adrenal cortex causes _____.
a) Addison's disease b) diabetes mellitus c) diabetes insipidus d) Grave's disease
33. Which of the following statements regarding hormones is incorrect?
a) Hormones are non-nutrient chemicals which acts as intercellular messengers
b) Hormones are molecules of low molecular weight and are produced in traces
c) Hormones provide energy and also effect growth and metabolic activities of target cell.
d) Many hormones are produced in inactive form
34. Hypersecretion of Growth Hormone in adults does not cause further increase in height. because _____.
a) Epiphyseal plates close after adolescence.
b) Bones loose their sensitivity to Growth Hormone in adults.
c) Muscle fibres do not grow in size after birth.
d) Growth Hormone becomes inactive in adults.
35. Name a peptide hormone which acts mainly on hepatocytes, adipocytes and enhances cellular glucose uptake and utilisation.
a) Insulin b) Glucagon c) Secretin d) Gastrin
36. **Assertion:** Oxytocin is called 'milk-ejection hormone'.
Reason: Oxytocin acts on the smooth muscles of uterus and stimulates its contraction.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
37. Reabsorption of Na^+ is controlled by which one of the following hormones?
a) Aldosterone b) Estrogen c) Glucocorticoid d) Testosterone
38. Which one of the following statements is correct?
a) Endocrine glands regulate neural activity, but not vice versa.
b) Neurons regulate endocrine activity, but not vice versa
c)
Endocrine glands regulate neural activity, and nervous system regulates endocrine glands.
d) Neither hormones control neural activity nor the neurons control endocrine activity.
39. Which of the following statements about 'neurohypophysis' is correct?

- a) It stores the hormones produced by adenohypophysis
 b) It is poorly developed and functionless in humans
 c) It stores and releases hormones secreted by hypothalamus
 d) It secretes its own hormones.
40. Supra optic nuclei (in hypothalamus) secrete the hormone.
 a) ADH b) Oxytocin c) Pitocin d) Both (2) & (3)
41. Read the given paragraph and select the option that correctly fills the blanks in it.
 Hormones produce their effect on target tissue by binding to specific ____A____ called hormone receptors located in the target tissues only. Water soluble hormones usually need ____B____ receptor that generate ____C____ messengers for regulating cellular metabolism. ____D____ soluble hormones can pass through cell membrane and bind to ____E____ receptors, mostly nuclear receptors. The hormone receptor complex enter the nucleus and mostly regulate gene expression or chromosome function by interaction of hormone-receptor complex with the genome.
- a)
- | | | | | |
|----------|---------------|--------|-------|---------------|
| A | B | C | D | E |
| proteins | membranebound | second | lipid | intracellular |
- b)
- | | | | | |
|--------|---------------|--------|-------|---------------|
| A | B | C | D | E |
| lipids | membranebound | second | water | intracellular |
- c)
- | | | | | |
|----------|---------------|--------|-------|---------------|
| A | B | C | D | E |
| proteins | intracellular | second | lipid | extracellular |
- d)
- | | | | | |
|----------|---------------|---------|-------|---------------|
| A | B | C | D | E |
| proteins | membranebound | primary | lipid | intracellular |
42. Which of the following conditions is not linked to deficiency of thyroid hormone?
 a) Cretinism b) Goitre c) Myxoedema d) Exophthalmia
43. Which of the following hormones regulate calcium balance in body?
 a) TCt b) OTH c) ADH d) Both (1) & (2)
44. Secretion of which of the following is under control of neurosecretory nerve cells?
 a) Pineal b) Adrenal cortex c) Anterior pituitary d) Thymus
45. Select the correct matching of a hormone, its source and function.

a)

Hormone	Source	Function
Vasopressin	Posterior pituitary	Increases loss of water through urine

b)

Hormone	Source	Function
Norepinephrine	Adrenal medulla	Increases heart beat, rate of respiration and alertness

c)

Hormone	Source	Function
Glucagon	Beta-cells of islets of Langerhans	Stimulates glycogenolysis

d)

Hormone	Source	Function
Prolactin	Posterior pituitary	Regulates growth of mammary glands and milk formation in females

46. Thyroxine brings about effects on target cells by
 a) Altering gene expression b) Activating adenylate cyclase
 c) Activating guanylate cyclase d) Activating G-protein
47. ADH
 a) increases water absorption b) decreases water absorption c) synthesises salt
 d) controls sugar level of blood.
48. Ovulation in females is under the control of
 a) ADH and LH b) LH c) TSH and LH d) LTH and TSH
49. Which of the following is caused due to hypersecretion of thyroxine hormone?
 a) Goitre b) Exophthalmic goitre c) Cretinism d) Myxoedema
50. Which of the following is synthesised in both the brain and endocrine glands?
 a) ACTH b) Cortisol c) Oxytocin d) Somatostatin
51. Adrenaline directly affects on _____.
 a) S. A. node b) β -cells of Langerhans c) dorsal root of spinal cord
 d) epithelial cells of stomach
52. The amino acid tryptophan is the precursor for the synthesis of :
 a) Cortisol and Cortisone b) Melatonin and Serotonin c) Thyroxine and Tri-iodothyronine
 d) Melatonin and Progesterone
53. Which of the following statements regarding glucagon is false?
 a) It is secreted by α -cells of Langerhans b) It acts antagonistically to insulin.
 c) It decreases blood sugar level
 d) The gland responsible for its secretion is a heterocrine gland.
54. A steroid hormone which regulates glucose metabolism is _____.
 a) corticosterone b) 11-deoxycorticosterone c) cortisone d) Cortisol
55. When both ovaries are removed from rat then which hormone is decreased in blood?
 a) Oxytocin b) Prolactin c) Estrogen d) Gonadotropin releasing factor
56. Hormones are called chemical signals that stimulate specific target tissues. Which is the correct location of these receptors in case of protein hormones?
 a) Extracellular matrix b) Blood c) Plasma membrane d) Nucleus
57. A chemical signal that has both endocrine and neural roles is:
 a) Melatonin b) Calcitonin c) Epinephrine d) Cortisol
58. Female reproductive cycle is regulated by
 a) Estrogen b) Progesterone c) Relaxin d) Both (1) & (2)

59. Insulin receptors are

- a) extrinsic proteins b) intrinsic proteins c) G-proteins d) trimeric proteins

60. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Thyroid	(i) Acts on the renal tubules
B. Adrenal	(ii) Regulates blood calcium level
C. Pituitary	(iii) Maintains diurnal rhythm of our body
D. Pineal	(iv) Acts on the melanocytes

- a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(iii), B-(iv), C-(i), D-(ii) c) A-(iv), B-(ii), C-(iii), D-(i)
d) A-(ii), B-(i), C-(iv), D-(iii)

61. Pancreas has two types of cells namely islets of Langerhans and acinar cells. In the early years of research on diabetes, extract of this gland was tested on diabetic patients. Results are tabulated below:

		Reduction in blood sugar level
A	Extract of pancreas	-
B	Islet cell extract	+
C	Acinar cell extract	-

The correct interpretation is that

- a) anti-diabetic factor present in extract 'C' was inactivated by extract 'A'
b) anti-diabetic factor present in 'A' was destroyed by 'B'
c) both 'A' and 'C' destroyed the anti-diabetic factor present in 'B'
d) anti-diabetic factor present in 'B' was destroyed by 'C'.

62. Hypothalamus forms an important link between

- a) Digestive system and nervous system b) Digestive system and respiratory system
c) Digestive system and endocrine system
d) Integumentary system and reproductive system

63. A scientist was studying the production of a protein that was released by an animal cell into a culture medium. She found that the protein only appeared in the culture medium after she added a few drops of a hormone to the cell. Before adding the hormone, she labelled the protein inside the cell with a fluorescent dye and looked at the cell under the light microscope. The dye was seen in flattened sheets and tube-like structures throughout the cell, and in stacks of flattened sac-like structures. After adding the hormone, the dye was also seen as small dots clustered against the cell membrane. Which statement most likely explains these observations?

a)

The hormone stimulates protein synthesis in the cell vacuole, the protein is then passed to the Golgi apparatus, and eventually passes through the cell membrane by passive diffusion.

b)

The hormone triggers the synthesis of the protein in the endoplasmic reticulum and it is then secreted outside of the cell via channel proteins in the cell membrane

c)

The protein is made in the endoplasmic reticulum, is passed to the Golgi apparatus and is secreted through hormone-stimulated exocytosis

d)

The protein is made in the Golgi apparatus, is passed to the endoplasmic reticulum and is secreted through hormone-stimulated pinocytosis.

64. Which of the following hormones is a steroid?

a) Epinephrine b) Thyroxine c) Estrogen d) Gonadotropin

65. Which of the following hormones does not have a particular target organ in the body?

a) Growth hormone b) TSH c) Oxytocin d) FSH

66. Which hormone promotes cell division, protein synthesis and bone growth?

a) PTH b) ACTH c) ADH d) GH

67. **Assertion:** Androgens stimulate muscular growth.

Reason: Androgens produce anabolic effects on protein and carbohydrate metabolism.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

68. Which of the following anterior pituitary hormones is linked directly to body whereas other hormones mostly control other glands?

a) Somatotropin b) Somatocrinin c) Somatostatin d) Pitocin

69. The neurosecretory cells of hypothalamus which produce hormones are called

a) Nephrons b) Nuclei c) Granular cells d) Globular cells

70. Which of the following is incorrect w.r.t. neurohypophysis?

a) Neurohypophysis is also called pars nervosa

b) It synthesises two hormones, oxytocin and vasopressin

c) It receives neurohormones directly from neurosecretory cells

d) It comprises 25% portion of pituitary gland

71. **Assertion:** Insulin is an anabolic hormone.

Reason: A fall in blood amino acids also increases insulin secretion.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false.

72. Melanin protects us from _____.

a) U. V. rays b) visible rays c) infrared rays d) X-rays

73. If 'X' is a hormone which controls the carbohydrate metabolism in the body and 'Y' is a hormone which controls the secretion of 'X' then 'X' and 'Y' are

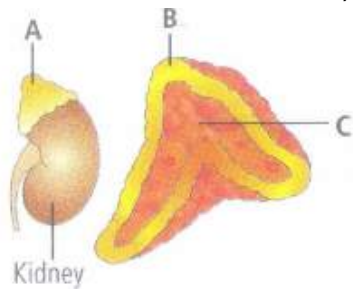
a) Insulin and somatotrophin b) Aldosterone and growth hormone

c) Glucocorticoid and ACTH respectively d) Glucocorticoid and GHRH

74. Which of the following is incorrect match?

- a) Thyroxine - Iodinated tyrosine b) Aldosterone - Polypeptide hormone
c) Estrogen - steroid hormone d) Thyropin - Glycoprotein hormone

75. Identify the parts labelled A, B and C in the given figure and select the correct option (second figure is the cross section of A).



a)

A	B	C
Adrenal gland	Cortex	Medulla

b)

A	B	C
JGA	Cortex	Medulla

c)

A	B	C
Adrenal gland	Medulla	Cortex

d)

A	B	C
Adrenal gland	Pars distalis	Pars intermedia

76. The gonadotropic hormones are secreted by

- a) anterior lobe of pituitary b) interstitial cells of testes c) adrenal cortex
d) posterior part of thyroid.

77. Which hormone possesses anti-insulin effect?

- a) Cortisol b) Calcitonin c) Oxlocin d) Aldosterone

78. Which one of the following pairs is incorrectly matched?

- a) Glucagon - Beta cells (source) b) Glucagon - Beta cells (source)
c) Corpus luteum - Relaxin (secretion) d) Insulin - Diabetes mellitus (disease)

79. Hormones of which of the following endocrine glands lacks peptides, amines and sulphur?

- a) Thyroid and adrenal gland b) Anterior pituitary c) Testes
d) Posterior pituitary and pancreas

80. A temporary endocrine gland in the human body is _____

- a) Corpus cardiacum b) Corpus luteum c) Corpus allatum d) pineal gland

81. Which of the following is an amino acid derived hormone?

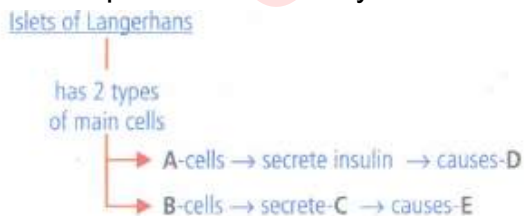
- a) Estradiol b) Ecdysone c) Epinephrine d) Estriol

82. Which of the following is/are correct statement(s) about the non-iodsed hormone secreted by thyrold gland?

- a) It is secreted by parafollicular cells b) It is secreted in response to hypercalcemia
c) It is antagonistic to PTH d) All of these

83. A decrease in blood pressure/volume will not cause the release of _____ .

- a) Atrial natriuretic factor b) Aldosterone c) ADH d) Renin
84. Identify the hormone with its correct matching of source and function _____
- a) Oxytocin - posterior pituitary growth and maintenance of mammary glands.
 b) Melatonin - pineal gland, regulates the normal rhythm of sleepwake cycle.
 c) Progesterone - corpus luteum, stimulation of growth and activities of female secondary sex organs
 d) Atrial natriuretic factor - ventricular wall increases the blood pressure
85. Which of the following glands are present in the brain?
- a) Parathyroid gland and thyroid gland b) Pituitary gland and thymus
 c) Hypophysis and pineal gland d) Pineal gland and thymus
86. Somatostatin inhibits the release of
- a) Prolactin b) Melanin c) Thymosin d) Growth hormone
87. The ductless glands:
- a) Produce non-nutrient intercellular messengers. b) Found only in non chordates.
 c) Are absent in human body. d) Are called exocrine glands.
88. Secretion of progesterone by corpus luteum is initiated by ICBSE AIM?
- a) thyroxine b) tH c) NdSH d) testosterone
89. In which of the following hormone works from outside the cell?
- a) Estrogen b) Cortisol c) Insulin d) Thyroxine
90. A pregnant female deliver a baby who suffers from stunted growth, mental retardation/low intelligence quotient and abnormal skin. This is the result of _____
- a) Low secretion of growth hormone b) Cancer of the thyroid gland
 c) Over secretion of pars distalis d) Deficiency of iodine in diet
91. MSH of pars intermedia of middle pituitary is responsible for _____
- a) darkening of skin in lower vertebrates b) light colouration of skin in lower vertebrates
 c) Both (a) and (b) d) darkening of skin in human beings
92. Select the option that correctly identifies A to E in the given flow chart.



a)

ABC	D	E
α Glucagon	Hyperglycaemia	Hypoglycaemia

b)

ABC	D	E
β Cortisol	Hypoglycaemia	Hypoglycaemia

c)

ABC	D	E
β Cortisol	Hypoglycaemia	Hypoglycaemia

d)

ABC	D	E
β Glucagon	Hypoglycaemia	Hypoglycaemia

93. Thymosin is responsible for

- a) raising the blood sugar level b) raising the blood calcium level
c) differentiation of T-lymphocytes d) decrease in blood RBC
94. The function of oxytocin is to help in
a) child birth b) gametogenesis c) growth d) all of these
95. Insulin is a/an
a) polysaccharide b) protein c) amino acid derivative d) lipid
96. Acromegaly is caused by _____
a) excess of GH. b) excess of thyroxine c) deficiency of thyroxine d) excess of adrenalin
97. Which one of the following endocrine glands stores its secretion in the extracellular space before discharging it into the blood?
a) Testis b) Thyroid c) Pancreas d) Adrenal
98. Which of the following is/are NOT secretion(s) of islets of Langerhans?
a) Glucagon b) Insulin c) Somatostatin d) Androstenedione
99. A person is having problems with calcium and phosphorus metabolism in his body. Which one of following glands may not be functioning properly?
a) Parotid b) Pancreas c) Thyroid d) Parathyroid
100. GnRH, a hypothalamic hormone, needed in reproduction, acts on _____.
a) anterior pituitary gland and stimulates secretion of LH and FSH.
b) posterior pituitary gland and stimulates secretion of oxytocin and FSH.
c) posterior pituitary gland and stimulates secretion of LH and relaxin.
d) anterior pituitary gland and stimulates secretion of LH and oxytocin.
101. What is the effect of GnRH produced by hypothalamus?
a) Stimulates the synthesis and secretion of androgens
b) Stimulates secretion of milk in mammary glands c) Stimulates fetal ejection reflex
d) Stimulates synthesis of carbohydrates from noncarbohydrates in liver
102. Which of the following is not a characteristic of insulin?
a) It stimulates the process of gluconeogenesis.
b) It binds to glycoprotein receptors on cell membrane
c) Its deficiency leads to diabetes mellitus d) Its oversecretion leads to insulin shock
103. Hormonal action initiates an expanding cascade of response. It is known as _____.
a) Amplification b) Synergistic effect c) Antagonistic effect d) Positive feed back
104. Melanocyte stimulating hormone in frog is released by
a) Hypothalamus b) Hypothalamus c) Pars distalis d) Pars intermedia
105. Excess secretion of growth hormone in adults leads to _____.
a) acromegaly b) goitre c) gigantism d) dwarfism
106. Which of the following is an accumulation and release centre of neurohormones?
a) Intermediate lobe of the pituitary b) Hypothalamus c) Anterior pituitary lobe
d) Posterior pituitary lobe
107. Which one of the following is not the function of insulin?

- a) Increases the permeability of cell membrane to glucose
- b) Increases the oxidation of glucose in the cells
- c) Initiates the conversion of glycogen to glucose
- d) Initiates the formation of hepatic glycogen from excess of glucose

108. Which of the following match is correct?

a)

Hormone	Effect
Oxytocin	Milk ejection hormone

b)

Hormone	Effect
Glucagon	Decreases blood sugar level

c)

Hormone	Effect
Adrenaline	Decreases heart rate

d)

Hormone	Effect
None of these	

109. Anterior pituitary gland facilitates growth of an individual by release of the human growth hormone (HGH) which in turn is regulated by two hormones namely growth hormone releasing hormone (GHRH) and growth hormone inhibiting hormone (GHIH). Imbalance of these hormones could result in gigantism, dwarfism or acromegaly. Interpret the data given below and select the appropriate statement.

Individual	Age group	Hormones released
1	2-5 yrs	Excessive GHRH
2	2-5 yrs.	Normal GHRH
3	30- 35 yrs.	Excessive GHRH
4	30- 35 yrs	Excessive GHIH
5	2-5 yrs	Excessive GHIH

- a) 1 and 3 will lead to gigantism while 4 and 5 will show dwarfism.
 - b) 3 will show gigantism, 1 will show acromegaly and 4 and 5 will show dwarfism.
 - c) 2, 3 and 4 will show normal growth.
 - d) 1 will show gigantism, 3 will show acromegaly and 5 will show dwarfism.
110. Identify from the following, a hormone produced by the pituitary gland in both males and females but functional only in females.
- a) Vasopressin b) Relaxin c) Prolactin d) Somatotrophic hormone
111. P is a small, round, reddish structure located on the dorsal side of forebrain. It contains a stalk and releases a hormone Q which controls diurnal rhythm of the body. P and Q are:
- a) Hypothalamus, MSH respectively b) Pineal gland, melanin respectively
 - c) Pineal gland, melatonin respectively d) Pituitary gland, MSH respectively
112. **Assertion:** PTH is a hypercalcemic hormone.
Reason: PTH stimulates the process of bone resorption.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion
 - c) If assertion is true but reason is false d) If both assertion and reason are false.

113. In a normal pregnant woman, the amount of total gonadotropin activity was assessed. The result expected was :
- a) High level of circulating FSH and LH in the uterus to stimulate implantation of the embryo
 - b) High level of circulating HCG to stimulate endometrial thickening
 - c) High level of FSH and LH in uterus to stimulate endometrial thickening
 - d) High level of circulating HCG to stimulate oestrogen and progesterone synthesis
114. What is the function of calcitonin?
- a) It increases calcium level in blood. b) It decreases calcium level in blood
 - c) It stimulates steroid synthesis d) It increases absorption of water in kidney tubules
115. Enzymes, vitamins and hormones can be classified into a single category of biological chemicals, because all of these
- a) help in regulating metabolism
 - b) are exclusively synthesised in the body of a living organism as at present
 - c) are conjugated proteins d) enhance oxidative metabolism.
116. Choose the correct option among the following.

Column A	Column B
A. Epinephrine	(i) Stimulates in muscle growth
B. Testosterone	(ii) Decrease in blood pressure
C. Glucagon	(iii) Breakdown of liver glycogen
D. Atrial natriuretic factor	(iv) Increases heart beat

- a) A-(ii), B-(i), C-(iii), D-(iv) b) A-(iv), B-(i), C-(iii), D-(ii) c) A-(i), B-(ii), C-(iii), D-(iv)
 - d) A-(i), B-(iv), C-(ii), D-(iii)
117. **Assertion:** The estrogen level falls after menopause.
Reason: The estrogen is synthesised and secreted mainly by uterine lining.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false d) If both assertion and reason are false
118. In which of the following is/are correct about catecholamines?
- (a) Water soluble
 - (b) Lipid soluble
 - (c) work through second messengers
 - (d) Alter gene expression
- a) (a) & (d) only b) (a) & (c) only c) (a), (c) & (d) only d) (b) & (d) only
119. **Assertion:** Neurohypophysis is under the direct regulation of the hypothalamus.
Reason: Neurohypophysis stores and releases two hormones called oxytocin and vasopressin which are actually synthesised by the hypothalamus.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion
 - c) If assertion is true but reason is false d) If both assertion and reason are false.

120. The islets of Langerhans are found in

- a) alimentary canal b) liver c) pancreas d) stomach

121. In females, LH stimulates _____ in the ovary to secrete ____.

- a) Graafian follicle, ICSH respectively b) Graafian follicle, prolactin respectively
c) Corpus luteum, FSH respectively d) Corpus luteum, Progesterone respectively

122. In which of the following options, hormone is not matching with its source and function?

a)

Hormone	Source	Function
Glucocorticoids	Adrenal cortex	Produces anti inflammatory reactions

b)

Hormone	Source	Function
Vasopressin	Posterior pituitary	Stimulates resorption of water and electrolytes

c)

Hormone	Source	Function
Parathyroid hormone	Thyroid	Decreases the blood Ca^{2+} level

d)

Hormone	Source	Function
Melatonin	Pineal gland	Maintains sleep-wake cycle

123. ACTH controls the secretion of

- a) Insulin b) Norepinephrine c) Epinephrine d) Glucocorticoids

124. Ca^{2+} level in body is controlled by:

- a) thyroid gland b) parathyroid gland c) adrenal gland d) both (a) and (b)

125. a) Corpus luteum-Relaxin (Secretion) b) Insulin-Diabetes mellitus (disease)

- c) Glucagon-Beta cells (source) d) Somatostatin-Delta cells (Source)

126. Which one of the following is proteinaceous in chemical nature?

- a) Thyroxine b) FSH c) Progesterone d) Oxytocin

127. A health disorder that results from the deficiency of thyroxine in adults and characterised by

- (i) a low metabolic rate
(ii) increase in body weight and
(iii) tendency to retain water in tissues is _____

- a) simple goitre b) myxoedema c) cretinism d) hypothyroidism

128. Which of the following pituitary hormones is known to have diabetogenic effect?

- a) TSH b) LH c) GH d) PRL

129. FSH is secreted by

- a) anterior lobe of pituitary b) hypothalamus c) gonads d) posterior lobe of pituitary

130. Which of the following lobe of the pituitary atrophies during foetal development and is smaller

- a) Pars distalis b) pars intermedia c) Adenohypophysis d) Neurohypophysis

131. TSH (thyroid stimulating hormone) is produced by

- a) adrenal cortex b) middle pituitary lobe c) anterior pituitary lobe
d) posterior pituitary lobe

132. The neuroendocrine structure is

a) Hypothalamus b) Adrenal cortex c) Pancreas d) Thyroid

133. Read the given statements that define functions of a particular hormone.

- (i) Regulates the development, maturation and functions of epididymis, vas deferens, seminal vesicle, prostate gland, urethra, etc.
- (ii) Stimulates muscular growth of facial and axillary hair, aggressiveness, low pitch of voice, etc.
- (iii) Stimulates spermatogenesis.
- (iv) Act on CNS and sexual behaviour (libido).
- (v) Produce anabolic (synthetic) effect on protein and carbohydrate metabolism.
- (vi) The Leydig's cells/interstitial cells (present in intertubular space) secrete this hormone under the influence of LH.

Which of the following hormones is referred here?

a) FSH b) Progesterone c) Androgen d) Melatonin

134. The hormone, which is related to the urine concentration in mammals, is

a) antidiuretic hormone b) testosterone c) oxytocin d) all of these

135. The gonadotropic hormones are produced by _____.

a) interstitial cells of testes b) adrenal cortex c) adenohypophysis of pituitary
d) posterior part of thyroid

136. In the mechanism of action of a protein hormone, one of the second messengers is

a) cyclic AMP b) insulin c) T_3 d) gastrin

137. Toxic agents present in food which interfere with thyroxine synthesis lead to the development of _____.

a) toxic goitre b) cretinism c) simple goitre d) thyrotoxicosis

138. Mainly which type of hormones control the menstrual cycle in human beings?

a) FSH b) LH c) FSH, LH, estrogen d) Progesterone

139. **Assertion:** Adrenal medullary hormones help in combating the stress condition.

Reason: Both adrenaline and noradrenaline act on same organs and produce similar effects.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false.

140. The source of somatostatin is same as that of

a) thyroxine and calcitonin b) insulin and glucagon c) somatotropin and prolactin
d) vasopressin and adrenaline

141. LH and FSH are collectively called:

a) somatotropins b) oxytocin c) gonadotropins d) luteotropic hormones

142. **Assertion:** Immune response of old persons become weak.

Reason: Thymus degenerates in old individuals.

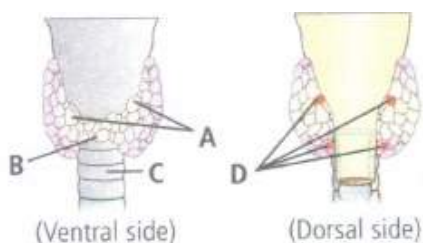
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.

143. Select the right match of endocrine gland and their hormones among the options given below:

Column I		Column II	
A	Pineal	i	Epinephrine
B	Thyroid	ii	Melatonin
C	Ovary	iii	Estrogen
D	Adrenal medulla	iv	Tetraiodothyronine

- a) A-(iv), B-(ii), C-(iii), D-(i) b) A-(ii), B-(iv), C-(i), D-(iii) c) A-(iv), B-(ii), C-(i), D-(iii)
 d) A-(ii), B-(iv), C-(iii), D-(i)
144. Hypothalamic hormones directly regulate the synthesis and secretion of
 a) Thyroid hormones b) Pituitary hormones c) Adrenal hormones d) parathormone
145. Melatonin is secreted by
 a) pineal body b) skin c) pituitary gland d) thyroid.
146. Insulin is secreted by _____ of pancreas.
 a) α -cells b) δ -cells c) β -cells d) none of these
147. ADH or vasopressin is _____.
 a) enzyme that hydrolyses peptides
 b) hormone secreted by pituitary that promotes reabsorption of water from glomerular filtrate
 c) hormone that promotes glycogenolysis
 d) energy rich compound connected with muscle contraction
148. Which of the following hormones is secreted by corticotrophs in humans?
 a) ACTH b) MSH c) PRL d) Both (1) & (2)
149. Which hormone stimulates the secretion of milk from female?
 a) Oxytocin b) Progesterone c) LH d) Prolactin
150. Besides corticotropin releasing hormone (CRH), which other hormone also stimulates the release of adrenocorticotrophic hormone (ACTH)?
 a) Glucagon b) Insulin c) Aldosterone d) Epinephrine
151. The two glands located in the neck region are
 a) Thyroid gland and parathyroid gland b) Pituitary gland and pineal gland
 c) Adrenal gland and pineal gland d) Pineal gland and thyroid gland
152. Which of the following hormones is responsible for gigantism?
 a) Growth hormone b) Somatostatin c) Adrenaline d) GnRH
153. Male hypogonadism results in
 a) Deficiency of androgens b) Hypofunction of sertoli cells c) Hypofunction of Leydig cells
 d) All of these
154. Estrogen and testosterone are steroid hormones, and most likely bind to

- a) membrane ion channels b) enzyme-linked membrane receptors
c) G-protein coupled membrane receptors d) cytoplasmic receptors
155. Which of the following statements is correct in relation to the endocrine system?
- a)
Organs in the body like gastrointestinal tract, heart, kidney and liver do not produce any hormones.
- b)
Non-nutrient chemicals produced by the body in trace amount that act as intercellular messenger are known as hormones.
- c) Releasing and inhibitory hormones are produced by the pituitary gland.
- d) Adenohypophysis is under direct neural regulation of the hypothalamus.
156. Which of the following statement is incorrect?
- a) pars intermedia atrophies during foetal development
- b) Pituitary gland is lodged in sella turcica c) Neurohypophysis synthesizes two hormones
- d) Herring bodies are present in neurohypophysis
157. Sertoli cells are regulated by the pituitary hormone known as
- a) GH b) Prolactin c) LH d) FSH
158. Which of the following is an incorrect statement?
- a) Hormones are required in trace amounts b) Hormones are intra-cellular messengers
- c) Hormones are secreted by endocrine glandular cells
- d) Hormones are secreted in response to a particular stimulus
159. Which one of the following pairs correctly/matches a hormone with a disease resulting from its deficiency?
- a) Luteinizing - Failure of ovulation b) Insulin - Diabetes insipidus c) Thyroxine - Tetany
- d) Parathyroid - Diabetes mellitus
160. Which of the following is called emergency gland of the body?
- a) Testis b) Adrenal c) Thymus d) Pituitary
161. Observe the given figures and select the option that correctly identifies the labels A, B, C and D.



a)

A	B	C	D
Parathyroid gland	Isthmus	Trachea	Thyroid gland

b)

A	B	C	D
Thyroid gland	Isthmus	Trachea	Parathyroid gland

c)

A	B	C	D
Thyroid gland	Isthmus	Larynx	Parathyroid gland

d)

A	B	C	D
Thyroid gland	Corpus luteum	Trachea	Parathyroid gland

162. Which one of the following hormones though synthesised elsewhere, is stored and released by the master gland?

- a) Melanocyte stimulating hormone b) Antidiuretic hormone c) Luteinizing hormone
d) Prolactin

163. **Assertion:** Renal cells are involved in stimulating the formation of RBCs.

Reason: The juxtaglomerular cells of kidney produce erythropoietin.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

164. **Assertion:** Adrenal cortex is not vital for survival and may be removed without subsequently leading to death.

Reason: Adrenal cortex secretes a number of steroid hormones which have only cumulative effects on the hormones of other glands.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

165. Secretion of progesterone by corpus luteum is initiated by

- a) testosterone b) thyroxine c) MSH d) LH.

166. Mark antagonistic hormones

- a) Insulin and glucagon b) Adrenaline and nor adrenaline c) Calcitonin and parathormone
d) Both (1) & (3)

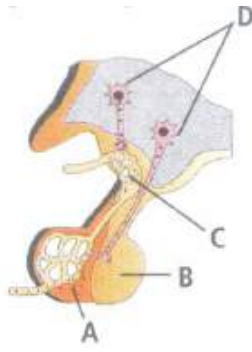
167. Which of the following works in association with cytoplasmic or nuclear receptors?

- a) Insulin b) Somatostatin c) Oxytocin d) Estrogen

168. Select the correct match.

- a) Matthew Meselson and F. Stahl : *pisum sativum*
b) Alfred Hershey TMV and Martha Chase c) Alec Jeffreys : *Streptococcus pneumoniae*
d) Francois Jacob and Jacques Monod : Lac operon.

169. Select the option that correctly identifies the labels A, B, C and D in the given diagram.



a)

A	B	C	D
Anterior pituitary	Posterior pituitary	Blood vessels	Thalamus

b)

A	B	C	D
Posterior pituitary	Anterior pituitary	Hypothalamus	Thalamus

c)

A	B	C	D
Anterior pituitary	Posterior pituitary	Portal circulation	Hypothalamic neurons

d)

A	B	C	D
Hypo-thalamic neurons	Posterior pituitary	Anterior pituitary	Portal circulation

170. Which one of the following hormones stimulates the 'let down' (release) of milk from the mother's breasts when the baby is sucking?

- a) Progesterone b) Oxytocin c) Prolactin d) Relaxin

171. Exophthalmic goitre is also called _____.

- a) Addison's disease b) diabetes insipidus c) Grave's disease d) acromegaly

172. Adrenocorticotrophic hormone is secreted by

- a) thyroid b) adrenal c) anterior pituitary d) posterior pituitary

173. Which of the following organs in mammals does not consist of a central 'medullary' region surrounded by a cortical region?

- a) Ovary b) Adrenal c) Liver d) Kidney

174. Which of the following hormones is not secreted by anterior pituitary?

- a) Growth hormone b) Follicle stimulating hormone c) Oxytocin
d) Adrenocorticotrophic hormone

175. Dwarfism occurs when there is

- (i) Over secretion of growth hormone
(ii) Under secretion of growth hormone
(iii) Over secretion of somatostatin
(iv) Under secretion of somatostatin

- a) (i) and (iii) b) only (ii) c) (ii) and (iii) d) (ii) and (iv)

176. Which of the following is not the function of insulin?
 a) Increases glycogenesis b) Increases glycogenolysis
 c) Promote oxidation of glucose and conversion of glucose into glycogen in muscle as well as liver cells
 d) Increase uptake of amino acids by liver and muscles
177. The steroid responsible for balance of water and electrolytes in our body is
 a) insulin b) melatonin c) testosterone d) aldosterone
178. Corpus luteum secretes a hormone called
 a) prolactin b) progesterone c) aldosterone d) testosterone
179. Which of the following radio active isotope is used in the detection of thyroid cancer?
 a) Iodine-131 b) Carbon-14 c) Uranium-238 d) Phosphorus-32
180. Which one of the following terms describe human dentition?
 a) Pleurodont, Monophyodont, Homodont b) Thecodont, Diphyodont, Heterodont
 c) Thecodont, Diphyodont, Homodont d) Pleurodont, Diphyodont, Heterodont
181. Select the mismatched pair from the following.
 a) Insulin - Gluconeogenesis b) Glucagon - Glycogenolysis
 c) Oxytocin - Contraction of uterine muscles
 d) Prolactin - Milk production in mammary glands
182. Match column I with column II and select the correct option from the codes given below.
- | Column I | Column II |
|------------|-------------------------|
| A. Testis | (i) Pigmentation |
| B. Ovaries | (ii) Atrophies in adult |
| C. Thymus | (iii) Estrogen |
| D. Melanin | (iv) Testosterone |
- a) A-(iii), B-(iv), C-(i), D-(ii) b) A-(ii), B-(iii), C-(iv), D-(i) c) A-(iv), B-(iii), C-(ii), D-(i)
 d) A-(i), B-(iv), C-(ii), D-(iii)
183. Which of the following is the hormone secreted by zona fasciculata?
 a) Aldosterone b) Cortisol c) Androstenedione d) Mineralocorticoids
184. Which one of the following pairs of hormones are the examples of those that can easily pass through the cell membrane of the target cell and bind to a receptor inside it (Mostly in the nucleus).
 a) Insulin, glucagon b) Thyroxine, insulin c) Somatostatin, oxytocin
 d) Cortisol, testosterone
185. Mary is about to face an interview. But during the first five minutes before the interview she experiences sweating, increased rate of heart beat, respiration, etc. Which hormone is responsible for her restlessness?
 a) Estrogen and progesterone b) Oxytocin and vasopressin
 c) Adrenaline and noradrenaline d) Insulin and glucagon
186. Which of the following is a commercial blood cholesterol lowering agent?

- a) Statin b) Streptokinase c) Lipases d) Cyclosporin A
187. Which of the following hormones is not a polypeptide?
a) LH b) FSH c) Insulin d) Thyroxine
188. Which of the following hormones is not a secretion product of human placenta?
a) Human chorionic gonadotropin b) Prolactin c) Estrogen d) Progesterone
189. Which of the following is a mineralocorticoid?
a) Testosterone b) Progesterone c) Adrenaline d) Aldosterone
190. A person entering an empty room suddenly finds a snake right in front of an opening the door. Which one of the following is likely to happen in his neuro-hormonal control system?
a)
Sympathetic nervous system is activated releasing epinephrine and norepinephrine from adrenal medulla
b) Neurotransmitters diffuse rapidly across the cleft and transmit a nerve impulse
c) Hypothalamus activates the parasympathetic division of brain
d)
Sympathetic nervous system is activated releasing epinephrine and norepinephrine from adrenal cortex
191. GnRH stimulates _____ to release _____.
a) Hypothalamas, gonadotropins b) Pituitary gland, gonadotropins
c) Pituitary gland, growth hormone d) Hypothalamus, growth hormone
192. The blood calcium level is lowered by the deficiency of
a) thyroxine b) calcitonin c) parathormone d) both (a) and (b).
193. Which of the following hormones is known to have calorogenic effect?
a) T_3 & T_4 b) TCT c) PTH d) Calcitriol
194. Which of the following hormones can play a significant role in osteoporosis?
a) Estrogen and Parathyroid hormone b) Progesterone and Aldosterone
c) Aldosterone and Prolactin d) Parathyroid hormone and Prolactin
195. Injury to adrenal cortex is not likely to affect the secretion of which one of the following?
a) Aldosterone b) Both Androstenedione and Dehydroepiandrosterone c) Adrenaline
d) Cortisol
196. Which gland atrophies in adults?
a) Pancreas gland b) Thymus gland c) Adrenal gland d) Thyroid gland
197. Which one of the following hormones never reaches to cytoplasm?
a) Estrogen b) FSH c) Progesterone d) Testosterone
198. What is correct to say about the hormone action in humans?
a) Glucagon is secreted by β -cells of islets of Langerhans and stimulates glycogenolysis.
b) Secretion of thyroxine is stimulated with ageing.
c) In females FSH first binds with specific receptors on ovarian cell membrane.
d) FSH stimulates the secretion of estrogen and progesterone.
199. A patient of diabetes mellitus excretes glucose in urine even when he is kept on a carbohydrate free diet. It is because

- a) fats are catabolised in adipose tissues to form glucose
 - b) amino acids are catabolised in kidney to form glucose
 - c) amino acids are discharged in blood stream from liver
 - d) glycogen from muscles is released in blood stream.
200. Which hormone causes dilation of blood vessels, increased oxygen consumption and glucogenesis?
- a) Adrenaline b) Glucagon c) ACTH d) Insulin
201. Which of the following does not play any role in calcium balance in the human body?
- a) Vitamin D b) Parathyroid hormone c) Thyrocalcitonin d) Thymosin
202. Which of the following hormones is/are stored in herring bodies?
- a) Both (2) & (3) b) Somatocrinin c) Vqassopressin d) Oxytocin
203. A hormone responsible for normal sleep-wake cycle is
- a) epinephrine b) gastrin c) melatonin d) insulin
204. Which one of the following hormone is not involved in sugar metabolism?
- a) Glucagon b) Cortisone c) Aldosterone d) Insulin
205. MSH is secreted by
- a) anterior lobe of pituitary b) middle lobe of pituitary c) posterior lobe of pituitary
 - d) endostyle
206. Which of the following statements is correct for 'parathornone'?
- a) It increases blood calcium level and decreases calcium store of the bone
 - b) It decreases blood calcium level and increases calcium store of the bone
 - c) It increases blood glucose level and decreases calcium store of the bone
 - d) It decreases blood glucose level and increases calcium store of the bone.
207. $X \xrightarrow{GnRH} Y \xrightarrow{LH} Z$. The glands which are represented as X, Y and Z are
- a) Pituitary gland, ovary and testis, respectively
 - b) Hypothalamus, adrenal gland and liver, respectively
 - c) Hypothalamus, pituitary gland and testis/ovary, respectively
 - d) Pituitary gland, thyroid gland and parathyroid gland, respectively
208. Pituicytes are under the control of
- a) adenohypophysis b) hypothalamus c) neurohypophysis d) both (a) and (c)
209. Which one of the following is termed temporary gland?
- a) Pineal b) Thymus c) Pancreas d) Kidney
210. Which of the following hormones prevent water loss in brine?
- a) Oxytocin b) Vasopressin c) Somatocrinin d) Somatostatin
211. Leydig cells produce a group of hormones called
- a) androgens b) estrogens c) aldosterone d) gonadotropins

212. Given below are four statements (A - D) each with one or two blanks. Select the option which correctly fills up the blanks in any two statements.
- (A) Thymus secretes _____ (i) _____ which help in differentiation of _____ (ii) _____.
- (B) The adrenal medulla secretes _____ (i) _____ which stimulates the breakdown of _____ (ii) _____ to increase the blood glucose concentration during emergency situations.
- (C) The Leydig's cells or _____ (i) _____ present in the intertubular spaces in testis, produce a group of hormones called _____ (ii) _____.
- (D) Thyroid gland secretes _____ (i) _____ and triiodothyronine which contain _____ (ii) _____.
- (A) - (i) melatonin, (ii) T-lymphocytes (B) - (i) catecholamine, (ii) glycogen
 a) (B) - (i) adrenaline, (ii) fat b) (C) - (i) interstitial cells, (ii) LH
 (B) - (i) catecholamine, (ii) glycogen (D) - (i) parathyroid hormone, (ii) calcium
 c) (D) - (i) thyroxine, (ii) iodine d) (A) - (i) thymosin, (ii) B-lymphocytes
213. According to the accepted concept of hormone action, if receptor molecules are removed from target organs, then the target organ will _____
- a) not respond to the hormone b) continue to respond to hormone without any difference
 c) continue to respond to the hormone but in the opposite way
 d) continue to respond to the hormone but will require higher concentration
214. **Assertion:** Thyroid hormones promote physical growth and development of mental faculties.
Reason: Hypothyroidism in adults causes retarded sexual development.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false
215. Which of the following is the widest layer adrenal cortex?
- a) Zona glomerulosa b) Zona fasciculata c) Zona reticularis
 d) Both (1) & (3) together make widest layer
216. Which one of the following hormones is a modified amino acid?
- a) Epinephrine b) Progesterone c) Prostaglandin d) Estrogen
217. _____ are responsible for chemical coordination.
- a) Neurons b) Nephrons c) Hormones d) Enzymes
218. Given below is an incomplete table about certain hormones, their source glands and one major effect of each on the body in humans. Select the option that correctly fills the blanks A, B and C.

Glands	Secretion	Effect on body
A	Estrogen	Maintenance of secondary sexual characters
Alpha cells of Islets of Langerhans	B	Raises blood sugar level
Anterior pituitary	C	Oversecretion leads to gigantism

a)

A	B	C
Placenta	Glucagon	Calcitonin

b)

A	B	C
Ovary	Glucagon	Growth hormone

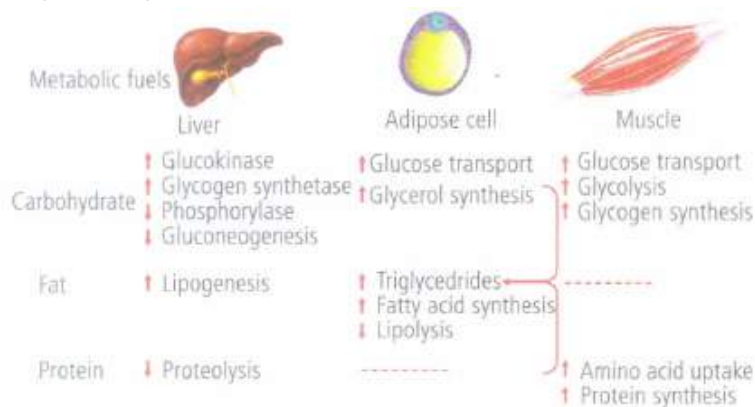
c)

A	B	C
Placenta	Insulin	Vasopressin

d)

A	B	C
Ovary	Insulin	Calcitonin

219. Diabetes insipidus occurs due to the hyposecretion of
 a) thymosine b) oxytocin c) insulin d) vasopressin
220. Diarrhoea is due to _____
 a) iodine deficiency b) hormonal deficiency c) Na⁺ deficiency d) enzyme deficiency
221. Adrenals are located above
 a) stomach b) liver c) pancreas d) kidney
222. Hormones thyroxine, adrenaline and the pigment melanin are formed from _____
 a) tryptophan b) glycine c) tyrosine d) proline
223. Graafian follicle gets converted into _____ after ovulation under the effect of _____.
 a) Corpus callosum, GnRH b) Corpus luteum, LH c) Corpus albicans, FSH
 d) Ovarian follicle, prolactin
224. Adenohypophysis in humans consists of two portions
 a) Pars distalis and pars nervosa b) Pars intermedia and pars distalis
 c) Pars nervosa and pars intermedia d) Anterior and posterior pituitary
225. **Assertion:** Cortisol produces anti-inflammatory reactions and suppresses the immune response.
Reason: Cortisol stimulates gluconeogenesis, lipogenesis and proteogenesis.
 a) If both assertion and reason are true and reason is the correct explanation of assertion
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false.
226. The given figure shows _____.



- a)
the major target sites and the metabolic actions of the anabolic hormone secreted by the beta cells of heterocrine gland
- b)
the major target sites and the metabolic actions of the hormone secreted by alpha cells of pancreas
- c)
the major target sites and the functions of the hormone secreted by the anterior pituitary gland
- d)
the major target sites and the metabolic actions of the hormone secreted by the parafollicular (C) cells
227. Feeling the tremors of an earthquake a scared resident of seventh floor of a multistored building starts climbing down the stairs rapidly. Which hormone initiated this action?
a) adrenaline b) glucagon c) gastrin d) thyroxine
- 228.
- | Column I | Column II |
|----------------------|--|
| A. FSH | (i) Transported axonally to neurohypophysis from hypothalamus |
| B. MSH | (ii) Acts on melanocytes and regulates pigmentation of skin |
| C. Vasopressin (ADH) | (iii) Stimulates the growth and development of ovarian follicles in female |
| D. Pars intermedia | (iv) In human, it is almost merged with pars distalis |
- a) A-(iii), B-(ii), C-(i), D-(iv) b) A-(i), B-(ii), C-(iii), D-(iv) c) A-(iv), B-(iii), C-(ii), D-(i)
d) A-(iii), B-(ii), C-(iv), D-(i)
229. All hypophysiotropic hormones are peptides except
a) corticotropin releasing hormone b) growth hormone inhibitory hormone
c) somatostatin d) prolactin release inhibiting hormone
230. **Assertion:** Insulin forms hormone receptor complex which regulate gene expression.
Reason: Insulin is a peptide hormone which can easily pass cell membrane to interact with hormone-receptor complex.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.



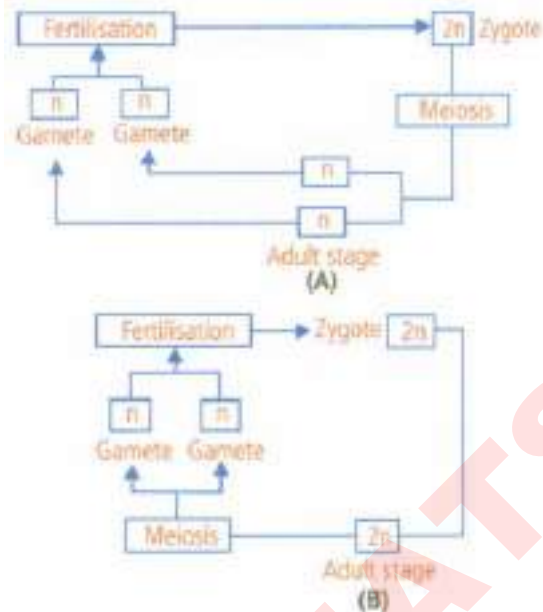
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REPRODUCTION IN ORGANISMS 1

Marks : 700

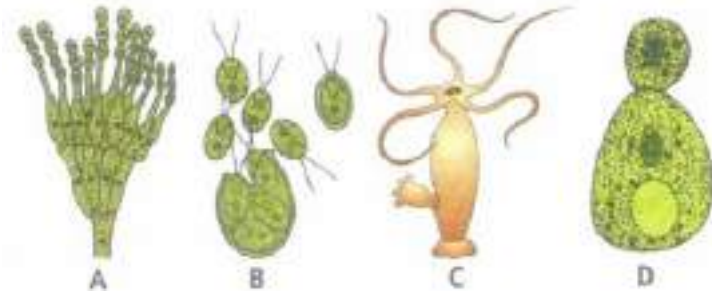
1. In these figures, two life-cycles are described. Mark the correct option



- a) A represents primitive life forms and B represents more advanced life forms.
 b) A represents terrestrial life forms and B represents aquatic life forms
 c) A represents asexual reproduction and B represents sexual reproduction.
 d) Both flow charts basically represent the same life-cycle.
2. Which of the following options correctly identifies artificial and natural methods of vegetative propagation?
- a)
- | Artificial methods | Natural methods |
|--------------------|-----------------|
| Grafting | Cutting |
- b)
- | Artificial methods | Natural methods |
|--------------------|-----------------|
| Layering | Bulbils |
- c)
- | Artificial methods | Natural methods |
|--------------------|-----------------|
| Offset | Tissue culture |
- d)
- | Artificial methods | Natural methods |
|--------------------|-----------------|
| Tuber | Rhizomes |
3. In organisms showing internal fertilisation, female gamete is non-motile. Lack of motility is advantageous because it
- a) facilitates less expenditure of energy b) assists in rapid division of female gamete
 c) helps the cell to store extra nutrients for rapid embryo development d) both (a) and (c).
4. Which one of the following processes results in the formation of clone of bacteria?
- a) Regeneration b) Budding c) Binary fission d) Fragmentation
5. If a fungal thallus has both male and female reproductive structures, it will be called
- a) heterothallic b) homothallic c) dioecious d) monoecious

6. Read the following statements and select the correct ones.
- (i) Conidia are the asexual propagules restricted to Kingdom Fungi.
 - (ii) A piece of potato tuber having at least one eye (or node) is capable of giving rise to a new plant.
 - (iii) Ginger propagates vegetatively with the help of its underground roots
 - (iv) Fleshy buds which take part in vegetative propagation are called bulbils, present in Dioscorea, Agave, etc.
- a) (ii) and (iii) b) (i) and (iv) c) (i), (ii) and (iv) d) (i), (ii) and (iii)
7. In which one pair-both are plants can be vegetatively propagated by leaf pieces?
- a) Agave and Kalanchoe b) Bryophyllum and Kalanchoe c) Asparagins and Bryophyllum
d) Chrysanthemum and agave
8. Read the following statements and select the correct option.
- Statement 1:** Unisexual flowers are either staminate flowers or pistillate flowers.
Statement 2: Both monoecious and dioecious plants have unisexual flowers.
- a) Both statements 1 and 2 are correct b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect
9. Assertion: Isogametes are formed in majority of sexually reproducing organisms.
Reason: Morphologically distinct type of gametes are called isogametes.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
10. The growth phase of an organism before attaining sexual maturity is referred to as
- a) juvenile phase b) vegetative phase c) both (a) and (b) d) none of these
11. Read the following statements about reproduction and select the incorrect one.
- a) It is a biological process in which an organism gives rise to young ones
b) It enables the continuity of the species c) It produces genetic variations in organisms
d) It maintains populations of the young and adult persons only.
12. Leaf buds are found in
- a) Agave b) Chlorophytum c) Bryophyllum d) Narcissus
13. Read the following statements and select the correct option.
- Statement 1:** In pea plant, transfer of pollen grains to the stigma is easy
Statement 2: In cross pollinating plants, pollination does not take place
- a) Both statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect.
14. Monoecious plant of Chara shows occurrence of _____
- a) stamen and carper of the same prant
b) upper antheridium and lower oogorium on the same plant
c) upper oogonium and lower antheridium on the same plant
d) antheridiophore and archegoniophore on the same plant

15. Refer to the given figures and select the correct option



- a) C and D reproduce by budding that includes nuclear division only
b) All of these reproduce by the asexual mode of reproduction
c) B represents multiple fission in an alga. d) A shows spore formation in a moneran.
16. During regeneration, modification of an organ to other organ is known as _____
a) Morphogenesis b) Epimorphosis c) Morphallaxis d) Accredonary growth
17. Life span could be 60 years in all of the following, except
a) Dog b) Horse c) Elephant d) Crocodile
18. Which of the following plant is monocarpic?
a) Mangifera b) Acacia c) Bambusa d) Zizyphus
19. Identify the incorrect statement
a)
In asexual reproduction, the offspring produced are morphologically and genetically identical to the parent
b) Zoospores are sexual reproductive structures
c)
In asexual reproduction, a single parent produces offspring with or without the formation of gametes
d) Conidia are asexual structures in Penicillium
20. Assertion: Embryogenesis is the development of embryo from the zygote
Reason: Cell divisions increase the number of cells in the developing embryo
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
21. Pick the odd one (w.r.t. monoecious plants)
a) Maize b) Ricinus c) Mulberry d) Cucurbits
22. Which of the following situations correctly describe the similarity between an angiosperm egg and a human egg?
(i) Eggs of both are formed only once in a lifetime
(ii) Both the angiosperm egg and human egg are stationary.
(iii) Both the angiosperm egg and human egg are motile transported
(iv) Syngamy in both results in the formation of zygote.
Choose the correct answer from the options given below.
a) (ii) and (iv) b) (iv) only c) (iii) and (iv) d) (i) and (iv)
23. Which one of the following statements is not correct?
a) Offspring produced by the asexual reproduction are called clone.
b) MicroGopic, motile asexual reproductive structures are called zoospores.

- c) In potato, banana and ginger, the plantlets arise from internodes present in the modified stem.
d)
Water hyacinth, growing in the standing water, drains oxygen from water that leads to the death of fishes
24. In which of the following plants, sepals do not fall off after fertilisation and remain attached to the fruit?
a) Brinjal b) Cucumber c) Papaya d) Bitter gourd
25. Offspring formed by sexual reproduction exhibit more variation than those formed by asexual reproduction because
a) sexual reproduction is a lengthy process
b) gametes of parents have qualitatively different genetic composition
c) genetic material comes from parents of two different species
d) greater amount of DNA is involved in sexual reproduction
26. In *Penicillium* special asexual reproductive structure produced is
a) Gemmule b) Conidia c) Buds d) Eyes
27. Assertion: Chances of survival of young ones is greater in viviparous organisms
Reason: All mammals are viviparous
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
28. Single celled animals are said to be immortal because
a) they grow indefinitely in size b) they can tolerate any degree of change in temperature
c) they can reproduce throughout their life span d) they continue to live as their daughter cells
29. Which of the following is a post-fertilisation event in flowering plants?
a) Transfer of pollen grains b) Embryo development c) Formation of flower
d) Formation of pollen grains
30. Read the following statements and select the correct option.
Statement 1: Viviparous animals give better protection to their offspring.
Statement 2: In viviparous animals, young ones, after attaining a certain stage of growth, are delivered out of the body of female organism.
a) Both statements 1 and 2 are correct b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect
31. Which of the following pairs is not correctly matched? mode of reproduction example:
a) Rhizome Banana b) Binary fission Sargassum c) Conidia penicillium
d) Offset Water hyacinth
32. In flowering plants, both male and female gametes are non-motile. The method to bring them together for fertilisation is
a) water b) air c) pollination d) apomixis
33. Flowers are unisexual in:
a) Pea b) Cucumber c) China rose d) Onion
34. The plant is propagated through roots is/are:
a) Sweet potato b) Asparagus c) Dahlia d) All of these
35. The wall of the ovary forms
a) pericarp b) fruit wall c) fruit d) both (a) and (b)

36. What is true for cleavage _____
a) Size embryo increases b) Size of cells decrease c) Size of cells increase
d) Size of cells increase
37. Which of the following organisms are known producers in the oceans ?
a) cyanobacteria b) Diatoms c) Dinoflagellates d) Euglenoids
38. Match column I with column II and select the correct option from the codes given below

Column I		Column II
A. Spong	(i)	Tube
B. Yeast	(ii)	Offset
C. Potato	(iii)	Gemmules
D Water hyacinth	(iv)	Budding

- a) A-(iv), B-(i), C-(ii), D-(iii) b) A-(iii), B-(i), C-(iv), D-(ii) c) A-(iii), B-(iv), C-(i), D-(ii)
d) A-(iv), B-(ii), C-(i), D-(iii)
39. In bryophytes and pteridophytes, transport of male gametes requires :
a) Water b) Wind c) Insects d) Birds
40. Which of the following statement(s) is not correct?
a) Offspring produced by the asexual reproduction are called clones.
b) Microscopic, motile asexual reproductive structures are called zoospores
c)
In potato, banana, and ginger, the plantlets arise from the internodes present in the modified stem.
d)
Water hyacinth growing in the standing water drains oxygen from water that leads to the death of fishes
41. Meiosis does not occur in
a) asexually reproducing diploid individuals b) sexually reproducing haploid individuals
c) sexually reproducing diploid individuals d) all of these
42. Appearance of vegetative propagules from the nodes of plants such as sugarcane and ginger is mainly because
a) nodes are shorter than internodes b) nodes have meristematic cells
c) nodes are located near the soil d) nodes have non-photosynthetic cells
43. The given diagram depicts fertilisation and development of which of the following types?

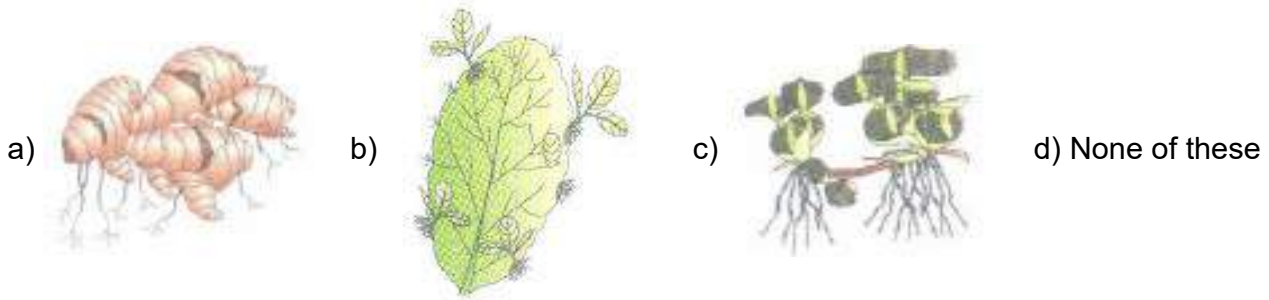


- a) Viviparity which is characteristic of reptiles b) Viviparity which is characteristic of amphibians.
c) Oviparity which is characteristic of hen
d) Ovoviviparity which is characteristic of some amphibians
44. Offsets are produced by
a) Parthenocarpy b) Mitotic divisions c) Meiotic divisions d) Parthenogenesis
45. Clear cut vegetative, reproductive and senescent phases cannot be observed in

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- a) annual plants b) perennial plants c) biennial plants d) ephemeral plants

46. In which of the following plants, vegetative propagation occurs by adventitious buds?



47. Which of the following has the longest life span?

- a) Banyan tree b) Tortoise c) Parrot d) Elephant

48. Senescent phase of an organism's life span can be recognised by

- a) slow metabolism reproduction b) cessation c) decreased immunity d) all of these

49. Select the option which arranges the given organisms in ascending order of their life span.

- a) Parrot < Crow < Butterfly < Banyan tree b) Butterfly < Crow < Parrot < Crocodile
c) Fruit fly < Crocodile < Parrot < Banyan tree d) Parrot < Tortoise < Dog < Crow

50. There is no natural death in single celled organisms like Amoeba and bacteria because

- a) they cannot reproduce sexually b) they reproduce by binary fission
c) parental body is distributed among the offspring d) they are microscopic

51. Strobilanthus kunthiana flowers once in

- a) 5 years b) 12 years c) 20 years d) 50 years

52. Vegetative propagation in mint occurs by _____.

- a) offset b) rhizome c) sucker d) runner

53. A dandelion produces seeds without meiosis or fertilisation. The adult sporophyte forms diploid, rather than haploid, megaspores that develop into ovules containing diploid, rather than haploid nuclei. One of the nuclei in each ovule becomes an egg and develops directly, without fertilisation, into an embryo that is genetically identical to its parent. This type of reproduction is called:

- a) parthenogenesis, which is a form of apomixis.
b) parthenogenesis, which is a form of amphimixis.
c) adventive embryony, which is a form of apomixis.
d) agamospermy, which is a form of amphimixis.

54. Assertion: In perennial plant species, it is difficult to define vegetative, reproductive and senescent phases.

Reason: Perennial plants have very short life span.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true and reason is the correct explanation of assertion
c) If assertion is true but reason is false. d) If assertion is true but reason is false.

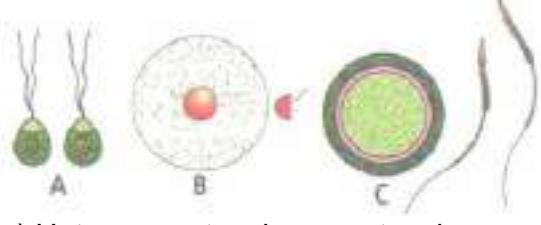
55. Select the option which shows viviparous animals only:

- a) Lizard, Turtle b) Platypus, Crocodile c) Cow, Crocodile d) Whale, Mouse

56. Assertion: Asexual reproduction involves formation of clones of an organism

Reason : Clones are morphologically and genetically similar individuals.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

57. Assertion: Algae and fish produce a large number of gametes.
Reason: Algae and fish show internal fertilisation.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
58. Select the incorrect statement about external fertilisation.
- a) Organisms showing external fertilisation produce a large number of male gametes only.
b)
External fertilisation is very uncertain and requires synchrony between release of male and female gametes.
c)
It is replaced by internal fertilisation in higher organisms as it wastes energy and requires external medium like water.
d) It occurs in most of the fishes and amphibians.
59. Life begin in all sexually reproducing organisms as a
- a) single-celled zygote b) double-celled zygote c) haploid zygote d) haploid gametes
60. The male gametes of rice plant have 12 chromosomes in their nucleus. The chromosome number in the female gamete, zygote and the cells of the seedling will be, respectively.
- a) 12, 24, 12 b) 24, 12, 12 c) 12, 24, 24 d) 24, 12, 24
61. Syngamy means _____.
- a) fusion of gametes b) fusion of cytoplasm c) fusion of two similar spores
d) fusion of two dissimilar spores
62. Which of the following statements is correct?
- a) All the individuals of a species have exactly the same life span
b) Smaller organisms always have shorter life span and vice versa
c) Life span of an organism is the time period from its birth to its natural death
d) No organism may have a life span of several hundred years
63. Select the incorrect statement.
- a) Amoeba and Paramecium reproduce by binary fission
b) Buds are produced due to unequal division in parent body
c)
Encystation refers to the formation of two layered hard covering around Amoeba during unfavourable condition
d) Spores are formed due to multiple fission in sporulation.
64. Refer the following figures and identify the type of gametes (A, B and C) respectively.
- 
- a) Heterogametes, isogametes, homogametes b) Isogametes, homogametes, heterogametes
c) Homogametes, isogametes, heterogametes
d) Homo/Isogametes, heterogametes, heterogametes
65. If a butterfly has chromosome number 360 in its meiocyte ($2n$). What will be the chromosome number in its gametes?

- a) 380 b) 180 c) 95 d) 760

66. Sexual reproduction is

- a) Fast b) Less elaborate c) Less complex d) Less rapid

67. The uniparental reproduction is called _____ reproduction while biparental reproduction is termed _____ reproduction. Higher organisms mostly show _____ reproduction.

- a) sexual, asexual, sexual b) asexual, sexual, asexual c) asexual, sexual, sexual
d) sexual, asexual, asexual

68. Match the column I with column II

Column I	Column II
(P) External fertilisation	(i) Earthworm
(Q) Internal fertilisation	(ii) Cockroach
(R) Bisexual	(iii) Frogs and Fishes
(S) Unisexual	(iv) Birds and mammals

- a) P-(iv), Q-(iii), R-(i), S-(ii) b) P-(iv), Q-(iii), R-(ii), S-(i) c) P-(iii), Q-(iv), R-(ii), S-(i)
d) P-(iii), Q-(iv), R-(i), S-(ii)

69. It is observed that simple organisms like algae and fungi normally reproduce asexually but before the onset of adverse conditions they shift to sexual reproduction. It is so because sexual reproduction

- a) saves time b) is rapid c) produces variations d) all of these.

70. The most significant value of vegetative propagation is that:

- a) It enables rapid production of genetic variation
b) It is a means of producing a large population of individuals genetically identical to the parent
c) It ensures that the progeny is safe from attack of diseases and pests
d) It involves reduction division

71. A multicellular, filamentous alga exhibits a type of sexual life cycle in which the meiotic division occurs after the formation of zygote. The adult filament of this alga has

- a) haploid vegetative cells and diploid gametangia
b) diploid vegetative cells and diploid gametangia
c) diploid vegetative cells and haploid gametangia
d) haploid vegetative cells and haploid gametangia

72. A. Hormones are responsible for transitions between three phase of life cycle.

B. Recovery phase in flowering plants is a part of juvenile phase.

- a) Only A is correct b) Only B is correct c) Both A and B are correct
d) Both A and B are incorrect

73. Which of the following pairs is not correctly matched?

a)

Mode of reproduction	Example
Conidia	Penicillium

b)

Mode of reproduction	Example
Offset	Water hyacinth

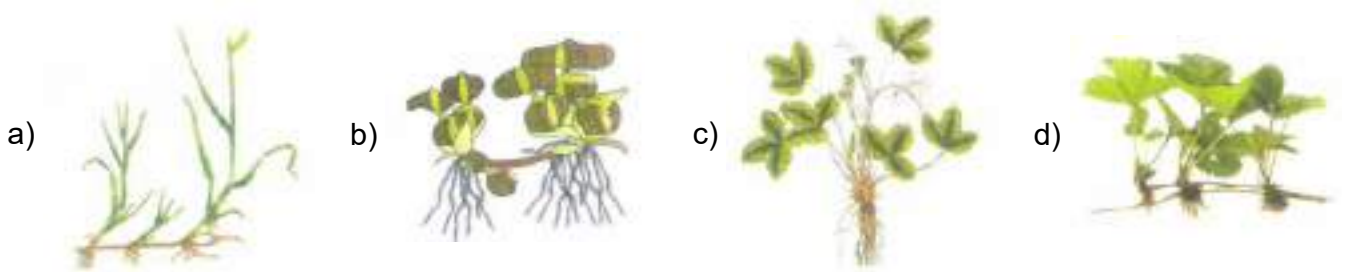
c)

Mode of reproduction	Example
Rhizome	Banana

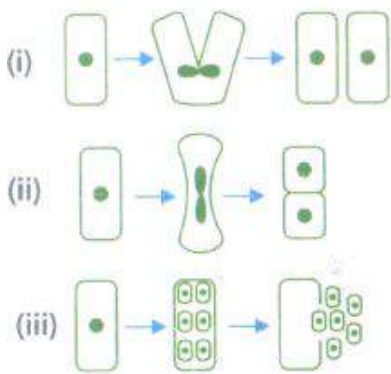
d)

Mode of reproduction	Example
Binary fission	Sargassum

74. This plant was introduced in India because of its beautiful flowers and shape of leaves but it became a notorious weed in Indian water bodies. Identify this plant.



75. Staminate flowers produce
 a) eggs b) antherozoids c) fruits d) all of these
76. In maize, a meiocyte has 20 chromosomes. What will be the number of chromosomes in its somatic cell?
 a) 40 b) 20 c) 30 d) 10
77. Refer to the given figures which show three different types of fission. Select the option which correctly matches them with the organism in which they occur.



a)			b)		
(i)	(ii)	(iii)	(i)	(ii)	(iii)
Euglena	Plasmodium	Amoeba	Plasmodium	Paramecium	Euglena
c)			d)		
(i)	(ii)	(iii)	(i)	(ii)	(iii)
Euglena	Paramecium	Escherichia	Euglena	Paramecium	Amoeba

78. Which of the following options shows bisexual animals only?
 a) Amoeba, sponge, leech b) Sponge, cockroach, Amoeb c) Earthworm, sponge, leech
 d) Tapeworm, earthworm, honeybee
79. Which one of the following is correctly matched?
 a) Chlamydomonas-Conidia b) Yeast-Zoospores c) Onion-Bulb d) Ginger-Sucker
80. Which of the following is not correct regarding sexual reproduction?
 a) it is usually biparental b) Gametes are always formed c) It is a slow process
 d) it involves only mitosis
81. If a leaf cell of Agave has x chromosomes then what will be the number of chromosomes in a cell of its bulbil?
 a) $2x$ b) $x/2$ c) $x/4$ d) x
82. In asexual reproduction
 a) Single parent is involved b) Gametic fusion is present c) Variations are produced
 d) Both (2) & (3)
83. Which of the following vegetative propagule is produced in Agave?
 a) Tuber b) Rhizome c) Corm d) Bulbil

84. Asexual method of reproduction by binary fission is common to which of the following?
- (i) some eukaryotes
 - (ii) All eukaryotes
 - (iii) Some prokaryotes
 - (iv) All prokaryotes
- a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (iii) and (iv)
85. The Eyes, of the potato tuber are _____
- a) root buds b) flower buds c) shoot buds d) axillary buds
86. Following table summarises the differences between self-fertilisation and cross-fertilisation. Pick out the wrong difference
- a)
- | Self-fertilisation | Cross-fertilisation |
|--------------------|---------------------|
| It is uniparental. | It is biparental. |
- b)
- | Self-fertilisation | Cross-fertilisation |
|---|---|
| It involves the fusion of male and female gametes of the same parent. | It involves the fusion of two gametes produced by different parents |
- c) _____ d) none of these
- c)
- | Self-fertilisation | Cross-fertilisation |
|----------------------------------|---------------------------------|
| Examples: Pheretima, Periplaneta | Examples: Taenia, Rana tigrina. |
87. Read the following statements and select the correct option
- Statement 1** : Many plants are propagated vegetatively even though they bear seeds
- Statement 2** : Sweet potatoes multiply vegetatively by root tubers
- a) Both statements 1 and 2 are correct b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect
88. Vegetative reproduction of Agave occurs through _____
- a) rhizome b) stolon c) bulbils d) sucker
89. Read the following statements and select the incorrect one.
- a) Cucurbits and coconuts are monoecious plants
 - b) Papayas and date palms are dioecious plants
 - c) Leeches and tapeworms are bisexual animals
 - d) Sponges and coelenterates are unisexual animals
90. Given below are a few statements related to external fertilisation. Choose the correct statements
- (i) The male and female gametes are formed and released simultaneously
 - (ii) Only a few gametes are released into the medium.
 - (iii) Water is the medium in a majority of organisms exhibiting external fertilisation
 - (iv) Offspring formed as a result of external fertilisation have better chance of survival than those formed inside an organism
- a) (iii) and (iv) b) (i) and (iii) c) (ii) and (iv) d) (i) and (iv)
91. Simple plants such as algae reproduce through special reproductive structures i.e.
- a) Zoospore b) Conidia c) Buds d) Gemma
92. New banana plants develop from _____
- a) rhizome b) sucker c) stolon d) seed
93. Select the mismatched pair of organism and its mode of multiplication.

a)

Organism	Mode of multiplication
Agave, Oxalis	Bulbils

b)

Organism	Mode of multiplication
Amoeba, Paramecium	Binary fission

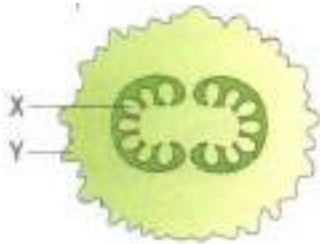
c)

Organism	Mode of multiplication
Chlamydomonas, Ulothrix	Sporangiospores

d)

Organism	Mode of multiplication
Adiantum caudatum	Adventitious buds present at leaf tips

94. Which of the labelled parts in the transverse section of tomato fruit, is/are diploid?



a) X b) Y c) Both X and Y d) None of these

95. Select the wrong statement:

a) Anisogametes differ either in structure, function or behaviour.

b)

In Oomycetes female gamete is smaller and motile, while male gamete is larger and non-motile.

c) Chlamydomonas exhibits both isogamy and anisogamy and Fucus shows oogamy.

d) Isogametes are similar in structure, function and behaviour.

96. Which of the following flowers only once in its lifetime?

a) Mango b) Jackfruit c) Bamboo species d) Papaya

97. The statements given below describe certain features that are observed in the pistil of flowers

(i) Pistil may have many carpels

(ii) Each carpel may have more than one ovule.

(iii) Each carpel has only one ovule.

(iv) Pistil have only one carpel

Choose the statements that are true from the options below

a) (i) and (ii) b) (i) and (iii) c) (ii) and (iv) d) (iii) and (iv)

98. Zygote of an organism developed after syngamy undergoes meiosis to form haploid spores, which divide mitotically and form the gametophyte. The organism must have _____ life cycle

a) haplontic b) diplontic c) haplodiplontic d) either (a) or (c)

99. _____ is a life process that is not essential for an individual's survival but for survival of the species.

a) Growth b) Reproduction c) Respiration d) Nutrition

100. Refer to the given figures of Marchantia and identify X and Y.



a)

X	Y
Male Thallus	Female Thallus

b)

X	Y
Female Thallus	Male Thallus

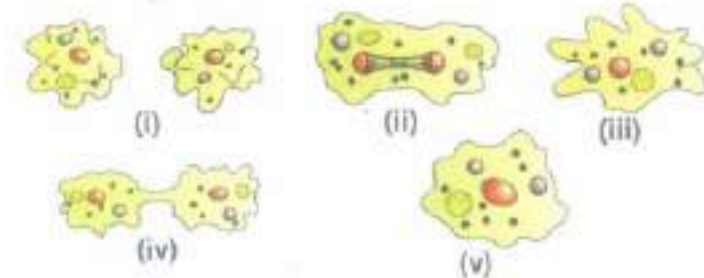
c)

X	Y
Oogonium	Antheridium

d)

X	Y
Antheridium	Oogonium

101. Study the given figures representing the process of binary fission in Amoeba



Arrange the figures in the correct sequence and select the correct answer

a) (iv) → (iii) → (i) → (ii) → (v) b) (iii) → (iv) → (i) → (ii) → (v)

c) (iii) → (v) → (ii) → (iv) → (i) d) (iv) → (iii) → (ii) → (v) → (i)

102. Which of the following statements is not correct regarding sexuality in organisms

a)

When both male and female flowers are present on the same plant, the condition is said to be monoecious and is present in cucurbits and coconuts

b)

When both male and female flowers are present on the separate plants, the condition is said to be dioecious and is present in papaya and date palms

c)

In earthworm, both male and female sex organs are present in the same individual and therefore, self fertilisation occurs in them

d) Cockroach is a unisexual animal and exhibit sexual dimorphism

103. Choose the correct statement from amongst the following.

a) Dioecious organisms are seen only in animals b) Dioecious organisms are seen only in plants

c) Dioecious organisms are seen in both plants and animals

d) Dioecious organisms are seen only in vertebrates

104. Read the following statements about 'Terror of Bengal' and select the correct ones.

(i) 'Terror of Bengal' is the name given to water hyacinth (Eichhornia), an algae

(ii) Eichhornia was introduced in India due to its aesthetic value

(iii) Eichhornia drains oxygen from the water which leads to death of fishes

a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (i), (ii) and (iii)

105. Fertilisation cannot occur in absence of surface water in

a) Fucus b) Funaria c) Marsilea d) all of these

106. The events in sexual reproduction are

(i) pre-fertilisation

(ii) fertilisation

(iii) post-fertilisation

The sequential order of their occurrence is

a) (ii) - (i) - (i) b) (iii) - (ii) - (i) c) (i)- (ii) - (iii) d) (i) - (iii) - (iv)

107. In these animals, the female retain the eggs inside its body after fertilisation and allows the development of embryo inside the body without providing extra nourishment to the developing embryo as the placenta is absent. Such animals are called as
a) oviparous animals b) viviparous animals c) ovoviviparous animals d) none of these
108. A few statements with regard to sexual reproduction are given below
(i) Sexual reproduction does not always require two individuals
(ii) Sexual reproduction generally involves gametic fusion.
(iii) Meiosis never occurs during sexual reproduction.
(iv) External fertilisation is a rule during sexual reproduction.
Choose the correct statements from the options below;
a) (i) and (iv) b) (i) and (ii) c) (ii) and (iii) d) (i) and (iv)
109. Identify the given organism and find its maximum life span



- a) Sparrow, 25 years b) Crow, 30 years c) Crow, 15 years d) Eagle, 40 years
110. Which one of the following shows clear cut vegetative, reproductive and senescent phases?
a) Annuals only b) All perennials c) Annuals and biennials d) All flowering plants
111. Vegetative propagation in *Pistia* occurs by:
a) stolon b) offset c) runner d) sucker
112. Deposition of calcareous shell around zygote occurs in
a) birds and reptile b) birds and mammals c) mammals and reptiles d) all of these
113. Grafting is the union between two plants of closely related varieties. Following are some statements regarding different types of grafting.
(i) An oblique cut followed by a notch is given to both stock and scion.
(ii) Scion is a bud with a small piece of bark and cambium.
(iii) Both stock and scion are of same diameter
(iv) Stock has many times more diameter than scion
Identify the type of grafting with respect to these statements and select the correct option
a)
can be wedge grafting in which v-shaped notch is given to stock whereas wedge like cut is given to scion
b) can be crown grafting in which many stocks are inserted in the slits made in the scions
c) can be tongue grafting in which diameter of stock is larger than that of scion.
d) can be bud grafting in which stock of monocot and scion of dicot plant are usually united
114. Read the following statements about the reproductive cycles in mammals and select the correct ones.
(i) Oestrous cycle occurs in primate mammals
(ii) In species with oestrous cycle, females are generally sexually active during oestrous phase
(iii) Both the cycles show monthly recurrence
a) (i) and (ii) b) (ii) and (iii) c) (ii) only d) (i), (ii) and (iii)

115. **Statement 1** : Zygote is the vital link between two generations.

Statement 2 : Zygote is formed due to fusion of two haploid gametes

- a) Both statements 1 and 2 are correct b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect

116. Assertion: Algae and fungi switch to asexual method of reproduction before the onset of adverse conditions

Reason: Asexual reproduction may introduce variations and leads to the formation of many clones

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

117. It is a common method of vegetative propagation in which 20 - 30 cm long pieces of one year old stems are cut, their lower ends are dipped in root promoting hormones and are then planted in the soil, which then develop adventitious roots. This method of vegetative propagation is performed in

- a) Begonia and Bryophyllum b) all of these c) rose and sugarcane d) lemon and orange

118. In seed plants, male gametes are transferred to egg cell by

- a) Air b) Water c) Insects d) Pollen grains

119. Which is not true for life span of an organism?

- a) Period from birth to natural death of an organism
b) It is necessarily correlated with size of organisms c) It may be very short
d) Senescence is a phase of life span vegetative, reproductive

120. Organisms reproducing throughout the year are called _____ breeders

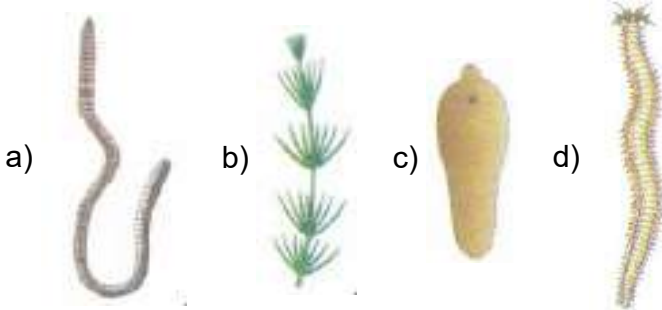
e.g., _____ and those who show recurring sexual activity are called _____ breeders e.g., _____

- a) continuous, sparrow, seasonal, hen b) seasonal, lizard, continuous, hen
c) continuous, man, seasonal, tiger d) seasonal, hen, continuous, tiger

121. Read the following statements about asexual reproduction and select the correct one

- (i) It involves a single parent.
(ii) It is slower than sexual reproduction.
(iii) It produces progeny that are genetically identical with the parent but not with one another.
(iv) The progeny of asexual reproduction can be termed as clones
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iv) d) (i), (iii) and (iv)

122. Which of the following is a unisexual organism?



123. *Strobilanthes kunthiana*

- a) Flowers once in 12 months b) Has blue flowers found in plains of Gujarat and Karnataka
c) Last flowered in September-October 2006
d) Is annual plant with the presence of recovery phase

124. A leaf cell of a flowering plant has 22 chromosomes then the number of chromosome would be:

- a) 11 in gametes b) 22 in gametes c) 44 in embryo d) 11 in a cell of stem

125. Identify the given vegetative propagule



- a) Bulb b) Runner c) Rhizome d) Bulbil

126. Off springs of oviparous animals are at greater risk of survival as compared to those of viviparous animals because:

- a) proper embryonic care and protection is absent b) embryo does not develop completely
c) progenies are of smaller size d) genetic variations do not occur

127. Which of the following is an incorrect combination of organism with its chromosome number in meiocyte and in gamete?

a)

Name of organism	Chromosome number in meiocyte	Chromosome number in gamete
Onion	24	12

b)

Name of organism	Chromosome number in meiocyte	Chromosome number in gamete
Ophioglossum	1260	630

c)

Name of organism	Chromosome number in meiocyte	Chromosome number in gamete
Human beings	46	23

d)

Name of organism	Chromosome number in meiocyte	Chromosome number in gamete
Fruit fly	8	4

128. Select the monocarpic plant out of the following:

- a) Bamboo b) Litchi c) Mango d) All of these

129. Which of the following is the vital link that ensures continuity of species between organisms of one generation and the next?

- a) Male gamete b) Female gamete c) Zygote d) Embryo

130. The number of chromosomes in the shoot tip cells of maize plant is 20. The number of chromosomes in the microspore mother cells of the same plant shall be

- a) 20 b) 10 c) 40 d) 15

131. Development of new individual from female gamete without fertilisation is termed as

- a) syngamy b) embryogenesis c) oogamy d) parthenogenesis

132. Fleshy buds produced in the axil of leaves, which grow to form new plants when shed and fall on ground, are called _____.

- a) bulbs b) bulbils c) tubers d) offsets

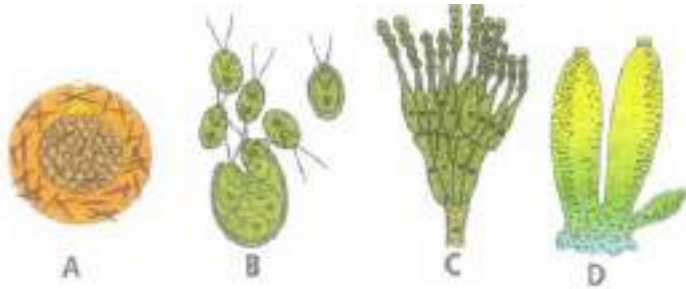
133. 'Clones' are individuals that have exactly the same

- a) lifespan b) physiology c) growth rate d) genetic makeup.

134. Which one of the following is wrong about Chara?

- a) Upper oogonium and lower round antheridium
 b) Globule and nucle present on the same plant c) Upper antheridium and lower oogonium
 d) Globule is male reproductive structure

135. Study the following figures and select the correct statements regarding these



- (i) A shows mode of asexual reproduction in sponges through internal buds.
 (ii) B shows sexual reproduction through zoospores in Chlamydomonas.
 (iii) C shows asexual reproduction through fragmentation in Penicillium.
 (iv) D shows external budding in Sycon.

a) (i) and (ii) b) (i) and (iii) c) (ii), (iii) and (iv) d) (i) and (iv)

136. A diploid parent plant body produces _____ gametes and a haploid parent plant body produces _____ gametes

a) diploid, haploid b) haploid, diploid c) diploid, diploid d) haploid, haploid

137. Meiosis takes place in _____

a) Meiocyte b) Conidia c) Germule d) Megaspore

138. Strobilanthus kunthiana differs from bamboo in

a) being monocarpic b) length of juvenile phase c) being polycarpic d) none of these

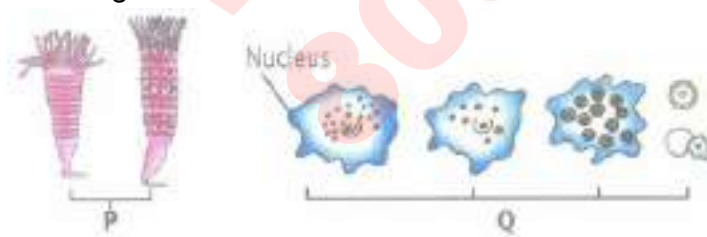
139. A population of genetically identical individuals, obtained from, asexual reproduction is _____

a) callus b) clone c) deme d) aggregate

140. During binary fission, in Amoeba which of the following organelles is duplicated?

a) Plasma membrane b) Nucleus c) Contractile vacuole d) All of these

141. Given figures illustrate



a)

P	Q
Metamerism	Multiple fission by a
by a cnidarian	protist

b)

P	Q
Strobilation	Multiple fission by a
by a cnidarian	protist

c)

P	Q
Fragmentation by	Internal budding by a
a platyhelminth	sponge

d)

P	Q
Strobilation by a	Sporulation by a
platyhelminth	protist

142. A few statements describing certain features of reproduction are given below.

- (i) Gametic fusion takes place.
 (ii) transfer of genetic material takes place.
 (iii) Reduction division takes place.

(iv) Progeny have some resemblance with parents.

Select the options that are true for both asexual and sexual reproduction from the options given below

- a) (i) and (ii) b) (ii) and (iii) c) (ii) and (iv) d) (i) and (iii)

143. Which of the following statements, support the view that elaborate sexual reproductive process appeared much later in the organic evolution?

- (i) Lower groups of organisms have simpler body design.
(ii) Asexual reproduction is common in lower groups
(iii) Asexual reproduction is common in higher groups of organisms
(iv) The high incidence of sexual reproduction in angiosperms and vertebrates

Choose the correct answer from the options given below

- a) (i), (ii) and (iii) b) (i), (iii) and (iv) c) (i), (ii) and (iv) d) (ii), (iii) and (iv)

144. Assertion: Some female animals permit copulation only during oestrous cycle.

Reason: Oestrous cycle is observed in non-primate mammals.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

145. Which of the following animals show menstrual cycle?

- a) Gorillas and chimpanzees b) Monkeys and human c) Orangutans and monkeys
d) All of these

146. There are various types of reproduction. The type of reproduction adopted by an organism depends on

- a) the habitat and morphology of the organism b) morphology of the organism
c) morphology and physiology of the organism
d) the organisms habitat, physiology and genetic makeup.

147. Oestrous cycle is reported in

- a) cows and sheep b) humans and monkeys c) chimpanzees and gorillas d) none of these.

148. The process of series of changes from larva to adult after embryonic development is called _____

- a) regeneration b) metamorphosis c) growth d) ageing

149. Assertion: Cucurbita is a monoecious plant

Reason: In Cucurbita, both male and female flowers are present on the same plant

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

150. Spirogyra is a sexually reproducing alga in which vegetative thallus is haploid. In Spirogyra, meiosis

- a) never occurs b) occurs at time of gamete production c) occurs after fertilisation
d) occurs during vegetative growth

151. Assertion: The zygote developed from sexual reproduction is diploid.

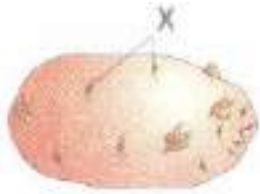
Reason: In sexual reproduction, haploid gametes fuse and form zygote

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

152. Which of the following statements is incorrect?

- a) Earthworms and leeches are hermaphrodite animals
b) Young ones of animals showing external fertilisation receive little or no parental care
c)
If the egg is not fertilised, it is thrown out of the body along with the lining of the uterus as menstrual flow
d) Sex organs in human beings are formed at puberty
153. Which of the following options shows two plants in which new plantlets arise from the same organ?
a) Dahlia and ginger b) Potato and sweet potato c) Dahlia and rose
d) Potato and sugarcane
154. Sexual reproduction is considered more beneficial than asexual reproduction because
a) it is not affected by adverse environmental conditions b) fertilisation is a chance factor
c) it rapidly multiplies the population d) it assists in evolution by producing variations
155. Asexual reproduction is the _____ method of reproduction in organisms that have a relatively simple organisation _____ like and _____
Fill in the blanks in the above statement.
a) rare, plant, bacteria b) common, plant, bacteria c) common, algae, fungi
d) rare, algae, fungi
156. Which of the following is not used for vegetative propagation?
a) Bud b) Bulbil c) Turion d) Antherozoid
157. Assertion: Reproduction enables the continuity of the species generation after generation
Reason: Reproduction is a biological process in which an organism gives rise to young ones similar to itself
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
158. Read the following statements about embryogenesis and select the incorrect option.
a) It is the process of development of embryo from zygote
b) During this process, zygote undergoes cell division and cell differentiation
c) Cell divisions decrease the number of cells in developing embryo
d)
Cell differentiation helps groups of cells to undergo certain modification to form specialised tissues and organs.
159. Viviparity is found in
a) sharks b) lizards c) frogs d) birds
160. In ginger vegetative propagation occurs through
a) Runners b) Rhizome c) Offsets d) Bulbils
161. Assertion : Water hyacinth is an invasive aquatic plant which spreads all over the water in a short period of time
Reason: Water hyacinth can reproduce vegetatively
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

162. Refer to the given figure and identify X in it.



- a) Offset b) Eyes c) Runner d) Bulb
163. Which of the following groups is formed only of the hermaphrodite organisms?
a) Earthworm, tapeworm, housefly, frog b) Earthworm, tapeworm, sea horse, housefly
c) Earthworm, leech, sponge, roundworm d) Earthworm, tapeworm, leech, sponge
164. Which of the following statements is not correct regarding oviparous animals?
a) Females lay fertilised/unfertilised eggs at a safe place
b) Development of zygote takes place outside the female's body
c) Examples of oviparous animals are all birds, most reptiles and egg-laying mammals.
d) None of these
165. Which of the following organisms has the highest number of chromosomes?
a) Housefly b) Butterfly c) Ophioglossum d) Onion
166. Which of the following cannot serve as a vegetative propagule?
a) A piece of potato tuber with eyes b) A middle piece of sugarcane internode
c) A piece of ginger rhizome d) A marginal piece of Bryophyllum leaf
167. Assertion : Parthenogenesis does not play any role in organic evolution
Reason: In parthenogenesis females develop into new organisms without fertilisation
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
168. The term 'clone' cannot be applied to offspring formed by sexual reproduction because:
a) offspring do not possess exact copies of parental DNA
b) DNA of only one parent is copied and passed on to the offspring
c) offspring are formed at different times d) DNA of parent and offspring are completely different
169. Asexual reproduction is seen in members of Kingdom
a) Monera b) Plantae c) Animalia d) all of these.
170. Product of sexual reproduction generally generates
a) Longer viability of seeds b) Prolonged dormancy
c) New genetic combination leading to variation d) Large biomass
171. Which of the following animals give birth to young ones?
a) Ornithorhynchus and Echidna b) Macropus and Pteropus
c) Balaenoptera and Homo sapiens d) Both (b) and (c)
172. Which one of the following statement is incorrect:
a) Unicellular sex organs are present in Marchantia
b) Internal fertilisation occurs in all embryophytes
c) Development of endosperm is post-fertilisation event in angiosperms
d) In monoecious plant, flowers are unisexual
173. Assertion : Asparagus can be vegetatively propagated by the stem.
Reason: Asparagus has unbranched swollen, underground stem having circular nodes that have buds for growth of daughter plants

- a) If both assertion and reason are true and reason is the correct explanation of assertion
- b) If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false

174. Match the organisms given in column I with their mode of reproduction in column II and select the correct answer from the codes given below.

Column I		Column II
A. Potato	(i)	Zoospores
B. Spirogyra	(ii)	Stem cuttings
C. Rose	(iii)	Conidiospores
D. Penicillium	(iv)	Stem tubers

- a) A-(i), B-(iii), C-(ii), D-(iv)
- b) A-(iv), B-(i), C-(ii), D-(iii)
- c) A-(iv), B-(i), C-(iii), D-(ii)
- d) A-(ii), B-(i), C-(iv), D-(iii)

175. Assertion : Reproduction by zoospores occur in some higher fungi.

Reason: Zoospores are non-motile and non-flagellated spores.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false
- d) If both assertion and reason are false



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Time : 1 Mins

HUMAN REPRODUCTION 1

Marks : 987

1. Vasa efferentia are the ductules leading from _____
a) testicular lobules to rete testis. b) rete testis to vas deferens
c) vas deferens to epididymis d) epididymis to urethra.
2. Extrusion of second polar body from egg nucleus occurs _____.
a) after entry of sperm but before completion of fertilisation
b) after completion of fertilisation c) before entry of sperm
d) without any relation of sperm entry
3. A human female reaches menopause around the age of
a) 50 years b) 15 years c) 70 years d) 25 years.
4. The early stage human embryo distinctly possesses
a) gills b) gill slits c) external ear (pinna) d) eyebrows
5. The principal tail piece of human sperm shows the microtubular arrangement of
a) $7 + 2$ b) $9 + 2$ c) $11 + 2$ d) $13 + 2$
6. During bleeding phase of menstrual cycle unfertilised secondary oocyte undergoes autolysis. The interplay of hormones then is
a) Progesterone and estrogen continue the hypertrophy of endometrial lining.
b) Prolactin and progesterone reduces LH level causing regression of corpus luteum
c)
Progesterone inhibits the release of LH from pituitary causing regression of corpus luteum.
d)
Prolactin and estrogen inhibits progesterone secretion leading to sloughing off uterine lining.
7. Identify the correctly matched pair/pairs of the germ layers and their derivatives.
A. Ectoderm - Epidermis
B. Endoderm - Dermis
C. Mesoderm - Muscles
D. Mesoderm - Notochord
E. Endoderm - Enamel of teeth
a) A and D b) A and B c) A, C and D d) A, B, C and E
8. **Assertion:** Each seminiferous tubule is lined on its inside by three types of cells.
Reason: These cells are male germ cells, Sertoli cells and Leydig's cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

9. Match column I with column II and select the correct option from the codes given below.

Column - I	Column -II
A. Acrosome	(i) Rudimentary erectile tissue
B. Endometrium	(ii) Uterus
C. Polar body	(iii) Oogenesis
D. Clitoris	(iv) Spermatozoon

a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iv), B-(ii), C-(iii), D-(i) c) A-(iv), B-(iii), C-(ii), D-(i)
d) A-(iv), B-(iii), C-(i), D-(ii)

10. A human female is born with a million of eggs (primary oocyte) at the time of birth but only some 500 eggs get a chance of maturity. What is the destiny of rest of the eggs?

a) Rest of the eggs differentiate back to thecal and granulosa cells
b) Rest of the eggs nurture the dominant follicular cell.
c) Rest of the eggs move out of the ovary and are destroyed by leucocytes
d) Rest of the eggs break down and are absorbed i.e., degenerative follicular atresia

11. A change in the amount of yolk and its distribution in the egg will affect _____

a) pattern of cleavage b) number of blastomeres produced c) fertilisation
d) formation of zygote

12. At what stage of life is oogenesis initiated in a human female?

a) At puberty b) During menarch c) During menopause
d) During embryonic development

13. Which of the following groups of cells in the male gonad, represent haploid cells?

a) Spermatogonial cells b) Germinal epithelial cells c) Secondary spermatocytes
d) Primary spermatocytes

14. Ovulation occurs under the influence of _____.

a) LH b) FSH c) oestrogen d) progesterone

15. In oogenesis haploid egg is fertilised by sperm at which stage?

a) Primary oocyte b) Secondary oocyte c) Oogonium d) Ovum

16. Double fertilisation is _____

a) fusion of two male gametes with one egg
b) fusion of one male gamete with two polar nuclei.
c) fusion of two male gametes of pollen tube with two different eggs.
d) syngamy and triple fusion.

17. Given below are four statements (i)-(iv) regarding embryonic development in humans.

(i) Cleavage divisions bring about considerable increase in the mass of protoplasm.
(ii) With more cleavage divisions, the resultant blastomeres become smaller and smaller.
(iii) The blastomeres in the blastocyst are arranged into two layers, trophoblast and endometrium.

(iv) Cleavage divisions result in a solid ball of cells called morula.

Which of the above two statements are correct?

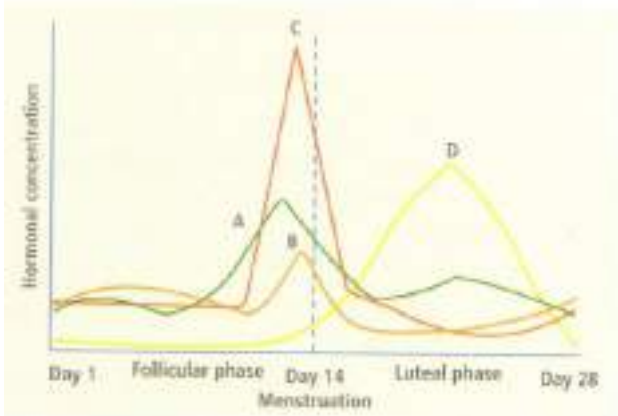
a) (i) and (iii) b) (ii) and (iv) c) (i) and (ii) d) (iii) and (iv)

18. Hormones secreted by the placenta to maintain pregnancy are _____.

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- a) hCG, progestogens, estrogens, glucocorticoids b) hCG, hPL, progestogens, estrogens
c) hCG, hPL, estrogens, relaxin, oxlocin d) hCG hPL, progestogens, prolactin
19. Sertoli cells are found in _____
a) ovaries and secrete progesterone. b) adrenal cortex and secrete adrenaline.
c) seminiferous tubules and provide nutrition to germ cells.
d) pancreas and secrete cholecystokinin
20. Assertion: The endometrium undergoes cyclical changes during menstrual cycle.
Reason: The myometrium exhibits strong contractions during delivery of the baby.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
21. In an experiment, sperms removed from epididymis of a man were added in a dish containing appropriate media and oocyte. No fertilisation was seen. However, when sperms from epididymis were directly placed in uterus of an ovulated woman, she became pregnant. These observations suggest that
a) the sperms need to travel some distance to attain fertilising ability
b) the oocyte secretes some biochemicals or factors which help sperms to fertilise
c) the hormones in the female body help sperms to attain fertilising ability
d) the contents of female reproductive tract interact with sperms and activate them for fertilisation
22. The testes in humans are situated outside the abdominal cavity insides pouch called scrotum. The purpose served is for _____
a) maintaining the scrotai temperature lower than the internal body temperature.
b) escaping any possible compression by the visceral organs
c) providing more space for the growth of epididymis.
d) providing a secondary sexual feature for exhibiting the male sex.
23. Signals for parturition originate from _____
a) Both placenta as well as fully developed foetus
b) Oxytocin released from maternal pituitary c) Ptracenta only
d) Fully developed foetus only
24. Fertilisins are emitred by _____
a) immature eggs b) mature eggs c) sperms d) polar bodies
25. Menstrual flow occurs due to lack of _____.
a) FSH b) Oxytocin c) Vasopressin d) Progesterone

26. Refer to the given graph representing interplay of different hormones (A-D) during menstrual cycle in women and answer the questions that follow.



- Which hormones are excreted in urine after menopause?
- a) A b) B c) C d) Both (b) and (c)
27. Meiotic division of the secondary oocyte is completed _____
- a) After zygote formation b) At the time of fusion of a sperm with an ovum
c) Prior to ovulation d) At the time of copulation
28. Urine test during pregnancy determines the presence of
- a) human chorionic gonadotropin hormone b) estrogen c) progesterone
d) luteinising hormone.
29. A sectional view of mammary gland shows
- (i) nipple + areola
(ii) mammary lobe, alveolus and duct
(iii) antibodies + pectoralis major muscles + ribs
(iv) ampulla + lactiferous duct
- a) (i), (ii) and (iv) b) (i), (ii) and (iii) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)
30. Which of the following hormones is not a secretory product of human placenta?
- a) Human chorionic gonadotropin b) Prolactin c) Estrogen d) Progesterone
31. The part of fallopian tube closest to the ovary is _____
- a) isthmus b) infundibulum c) cervix d) ampulla
32. Human eggs are _____ .
- a) alecithal b) microlecithal c) mesolecithal d) macrolecithal
33. Select the incorrect statement
- a) LH triggers ovulation in ovary
b) LH and FSH decrease gradually during the follicular phase
c) LH triggers secretion of androgens from the leydig cells
d) FSH stimulates the sertoli cells which help in spermiogenesis
34. In spermatogenesis, the phase of maturation involves
- a) the growth of spermatogonia into primary spermatocyte
b) the formation of spermatogonia from gonocytes through mitosis
c) the formation of spermatids from primary spermatocytes through meiosis
d) the formation of oogonia from the spermatocytes through meiosis
35. Morula is a developmental stage

- a) between the zygote and blastocyst b) between the blastocyst and gastrula
c) after the implantation d) between implantation and parturition.
36. Which one of the following statements is incorrect about menstruation?
a) During normal menstruation about 40 ml blood is lost
b) The menstrual fluid can easily clot.
c)
At menopause in the female, there is especially abrupt increase in gonadotropic hormones.
d) The beginning of the cycle of menstruation is called menarche.
37. 1st polar body is formed at which stage of oogenesis?
a) 1stmeiosis b) mitosis c) 1stmitosis d) Differentiation
38. Structure connecting the fetus to placenta is
a) umbilical cord b) amnion c) yolk sac d) chorion
39. The given figure depicts a diagrammatic sectional view of the human female reproductive system. Which set of three parts out of I-VI have been correctly identified?



- a) (II) Endometrium, (III) Infundibulum, (IV) Fimbriae
b) (III) Infundibulum, (IV) Fimbriae, (V) Cervix
c) (IV) Oviducal funnel, (V) Uterus, (VI) Cervix
d) (I) Perimetrium, (II) Myometrium, (III) Fallopian tube
40. Several hormones like hCG, hPL, estrogen, progesterone are produced by
a) Ovary b) Placenta c) Fallopian tube d) Pituitary
41. During oogenesis, each diploid cell produces
a) four functional eggs b) two functional eggs and two polar bodies
c) one functional egg and three polar bodies d) four functional polar bodies.
42. After birth, colostrum is released from mammary glands which is rich in
a) fat and low in proteins b) proteins and low in fat c) proteins, antibodies and low in fat
d) proteins, fat and low in antibodies.
43. Which one is released from the ovary?
a) Primary oocyte b) Secondary oocyte c) Graafian follicle d) Oogonium
44. During cleavage, what is true about cells?
a) Nucleocytoplasmic ratio remains unchanged b) Size does not increase
c) There is less consumption of oxygen d) The division is like meiosis
45. Acrosomal reaction of the sperm occurs due to
a) its contact with zona pellucida of the ova
b) reactions within the uterine environment of the female

c) reactions within the epididymal environment of the male

d) androgens produced in the uterus.

46. Consider the following four statements and select the correct option stating which ones are true (T) and which ones are false (F).

(i) The scrotum acts as a thermoregulator, maintaining the testes at a temperature 2°C lower than that of the body.

(ii) Corona radiata layer of the ovum prevents polyspermy.

(iii) Middle part of ear is derived from the endoderm layer.

(iv) The hormone, human chorionic gonadotropin facilitates parturition by softening the connective tissue of the pubic symphysis.

a)

(i)	(ii)	(iii)	(iv)
T	T	F	F

b)

(i)	(ii)	(iii)	(iv)
F	T	F	T

c)

(i)	(ii)	(iii)	(iv)
T	F	T	F

d)

(i)	(ii)	(iii)	(iv)
F	F	T	T

47. The first movements of the foetus and appearance of hair on its head are usually observed during which month of pregnancy?

a) Fourth month b) Fifth month c) Sixth month d) Third month

48. Why cannot a woman get pregnant again during pregnancy?

a)

A woman ovulates during pregnancy, but the oviducts are plugged with protective mucus to prevent sperm from entering.

b) High levels of hCG in women's bodies kill sperm.

c)

A woman cannot have intercourse during pregnancy due to the presence of a protective mucus plug that develops in the cervix.

d)

High levels of estrogen and progesterone, secreted by the corpus luteum or placenta during pregnancy, inhibit the secretion of gonadotropins and prevent ovulation.

49. Gastrula is the embryonic stage in which

a) cleavage occurs b) blastocoel form c) germinal layers form d) villi form.

50. Assertion : The type B spermatogonia are called primary spermatocytes.

Reason : Primary spermatocytes complete the first meiotic division leading to secondary spermatocytes.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

51. Acrosome reaction in sperm is triggered by _____

a) capacitation b) release of lysin c) influx of Na^+ d) release of fertilisin

52. Which of the following contains the actual genetic part of a sperm?

a) Whole of it b) Tail c) Middle piece d) Head

53. Read the given statements and select the correct option.

Statement 1: Upto morula stage, the cells divide without any increase in size.

Statement 2 : Zona pellucida remains intact till cleavage is complete

- a) Both statements 1 and 2 are correct
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

54. Which one of the following statements is false in respect of viability of mammalian sperm?

a) Sperm is viable for only up to 24 hours.

b)

Survival of sperm depends on the pH of the medium and is more active in alkaline medium.

c) Viability of sperm is determined by its motility

d) Sperms must be concentrated in a thick suspension.

55. **Assertion:** A drop in temperature does not affect spermatogenesis.

Reason: During temperature drop the smooth muscle contracts and bring the testes closer to the pelvic cavity.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

56. Select the option that correctly fills up the blanks in the given paragraph.

After one month of pregnancy, the embryo's (i) is formed. By the end of the (ii) month of pregnancy, the fetus develops limbs and digits By the end of (iii), most of the major organ systems are formed, for example, the limbs and external genital organs are well-developed. By the end of (iv), the body is covered with fine hair, eye-lids separate and eyelashes are formed.

- a) (i) - heart, (ii) - second, (iii) - first trimester, (iv) - second trimester
- b) (i) - heart, (ii) - second, (iii) - first month, (iv) - second month
- c) (i) - heart, (ii) - second, (iii) - first week, (iv) - second week
- d) (i) - heart, (ii) - fourth, (iii) - first trimester, (iv) - second trimester

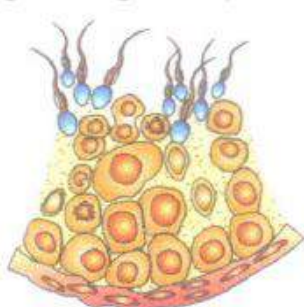
57. Meroblastic cleavage is a type of division _____

- a) horizontal b) partial/parietal c) total d) spiral

58. Lower narrow end of uterus is called

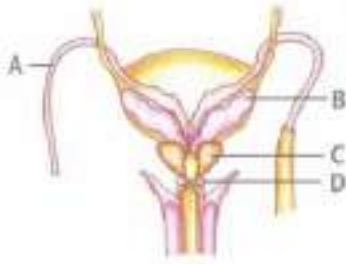
- a) urethra b) cervix c) clitoris d) vulva

59. What does the given figure represent?



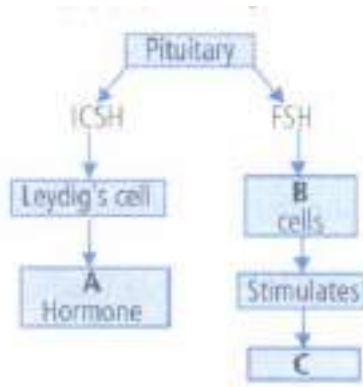
- a) Sectional view of ovary b) Sectional view of seminiferous tubule c) L.S. of testis
d) Mature Graafian follicle

60. The given figure shows a diagrammatic sketch of a portion of human male reproductive system. Identify the parts labelled as A, B, C and D and select the correct option.



- a) A-Vas deferens, B-Seminal vesicle, C-Prostate, D-Bulbourethral gland
b) A-Vas deferens, B-Seminal vesicle, C-Bulbourethral gland, D-Prostate
c) A-Ureter, B-Seminal vesicle, C-Prostate, D-Bulbourethral gland
d) A-Ureter, B-Prostate, C-Seminal vesicle, D-Bulbourethral gland
61. Given below are the three statements each with two blanks. Select the option which correctly fills up the blanks in any two statements
- (A) Each seminiferous tubule is lined on its inside by two types of cells called (i) and (ii).
(B) The seminiferous tubules open into the (i) through (ii).
(C) The enlarged end of penis called the (i) is covered by a loose fold of skin called the (ii).
- (A)-(i) spermatogonia, (ii) follicular cells (B)-(i) vasa efferentia, (ii) rete testis
a) (B)-(i) vas deferens, (ii) urethral meatus b) (C)-(i) glans penis, (ii) foreskin
(A)-(i) spermatogonia, (ii) Sertoli cells (A)-(i) spermatocytes, (ii) oogonia
c) (C)-(i) urethral meatus, (ii) scrotum d) (B)-(i) rete testis, (ii) vasa efferentia
62. Given below are three statements each with one or two blanks. Select the option which correctly fills up the blanks in any two statements.
- (A) In human beings, menstrual cycle ceases around 50 years of age; this is termed as (i).
(B) The milk produced during the initial few days of lactation is called (i) which contains several (ii) absolutely essential to develop resistance for the new-born babies.
(C) At the completion of the (i) division, the primary oocyte divides into secondary oocyte and (ii).
- a) (A)-(i) menarche; (B)-(i) lactation, (ii) minerals
b) (B)-(i) colostrum, (ii) antibodies, (CHi) first meiotic (ii) first polar body
c) (A)-(i) menopause; (CHi) second meiotic, (ii) second polar body
d) (A)-(i) menopause; (B)-(i) corpus luteum, (ii) antibodies

63. Given below is an incomplete flow chart showing influence of hormones on gametogenesis in males. Observe the flow chart carefully and identify A, B and C.



a)

A	B	C
Progesterone	Follicular	Spermatogenesis

b)

A	B	C
GnRH	Follicular	Sperm iogenesis

c)

A	B	C
GnRH	Sertoli	Spermatogenesis

d)

A	B	C
Androgens	Sertoli	Spermatogenesis

64. Blastopore is _____
 a) opening of neural tube b) opening of gastrocoel c) future anterior end of embryo
 d) found in blastula
65. Mature Graafian follicle is generally present in the ovary of a healthy human female around
 a) 5-8 day of menstrual cycle b) 11-17 day of menstrual cycle
 c) 18-23 day of menstrual cycle d) 24-28 day of menstrual cycle.
66. Which one of the following is not a male accessory gland?
 a) Seminal vesicle b) Ampulla c) Prostate d) Bulbourethral gland
67. Which one of the following statements about morula in humans is correct?
 a) It has almost equal quantity of cytoplasm as an uncleaved zygote but much more DNA.
 b) It has far less cytoplasm as well as less DNA than in an uncleaved zygote.
 c) It has more or less equal quantity of cytoplasm and DNA as in uncleaved zygote.
 d) It has more cytoplasm and more DNA than and uncleaved zygote.
68. The head of the epididymis at the head of the testis is called
 a) cauda epididymis b) vas deferens c) caput epididymis d) gubernaculum
69. The signals for parturition originate from _____
 a) placenta only b) placenta as well as fully developed foetus
 c) oxytocin released from maternal pituitary d) fully developed foetus only
70. Termination of gastrulation is indicated by _____
 a) obliteration of blastocoel b) obliteration of archenteron c) closure of blastopore
 d) closure of neural tube
71. What is the correct sequence of sperm formation?
 a) Spermatogonia, spermatozoa, spermatocyte, spermatid
 b) Spermatogonia, spermatocyte, spermatid, spermatozoa
 c) Spermatid, spermatocyte, spermatogonia, spermatozoa
 d) Spermatogonia, spermatocyte, spermatozoa, spermatid

72. The amnion of mammalian embryo is derived from
 a) mesoderm and trophoblast b) endoderm and mesoderm c) ectoderm and mesoderm
 d) ectoderm and endoderm
73. The second maturation division of the mammalian ovum occurs _____
 a) shortly after ovulation before the ovum makes entry into the fallopian tube.
 b) until after the ovum has been penetrated by a sperm.
 c) until the nucleus of the sperm has fused with that of the ovum.
 d) in the graafian follicle following the first maturation division.
74. The secretory phase in the human menstrual cycle is also called:
 a) Luteal phase and lasts for about 6 days b) Follicular phase and lasts for about 6 days
 c) Luteal phase and lasts for about 13 days d) Follicular phase and lasts for about 13 days
75. Layers of an ovum from outside to inside is:
 a) corona radiata, zona pellucida and vitelline membrane
 b) zona pellucida, corona radiata and vitelline membrane
 c) vitelline membrane, zona pellucida and corona radiata
 d) zona pellucida, vitelline membrane and corona radiata
76. Urethral meatus refers to the:
 a) urinogenital duct b) opening of vas deferens into urethra
 c) external opening of the urinogenital duct d) muscles surrounding the urinogenital duct.
77. Spermatogenesis is induced by
 a) FSH b) ICSH c) STH d) ATH.
78. In a normal pregnant woman, the amount of total gonadotropin activity was assessed. The result expected was
 a) high level of circulating FSH and LH in the uterus to stimulate implantation of the embryo
 b) high level of circulating hCG to stimulate endometrial thickening
 c) high levels of FSH and LH in uterus to stimulate endometrial thickening
 d) high level of circulating hCG to stimulate estrogen and progesterone synthesis.

79. Match the following columns and select the correct option

Column I	Column II
A Placenta	I Androgens
B Zona pellucida	II Human Chorionic Gonadotropin hCG
C Bulbo-urethral glands	III Layer of the ovum
D Leydig cells	IV Lubrication of the penis

a)	b)	c)	d)
A B C D	A B C D	A B C D	A B C D
III II IV I	II III IV I	IV III I II	I IV II III

80. Changes in GnRH pulse frequency in females is controlled by circulating levels of:
 a) Estrogen and inhibin b) Progesterone only c) Progesterone and inhibin
 d) Estrogen and progesterone.
81. Fertilization in humans is practically feasible only if

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- a) The sperms are transported into cervix within 48 hours of release to ovum in uterus
b) The sperms are transported into vagina just after the release of ovum in fallopian tube
c)
The ovum and sperms are transported simultaneously to ampullary - isthmic junction of the fallopian tube
d)
The ovum and sperms are transported simultaneously to ampullary - isthmic junction of the cervix
82. How many sperms are formed from 4 primary spermatocytes?
a) 4 b) 1 c) 16 d) 32
83. Which part of the sperm plays an important role in penetrating the egg membrane?
a) Allosome b) Tail c) Autosome d) Acrosome
84. Assertion: Infundibulum is a funnel shaped part closer to ovary.
Reason: The edges of infundibulum helps in collection of the ovum after ovulation.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
85. The given table shows differences between spermatogenesis and spermiogenesis. Select the incorrect option.
- a)
- | Spermatogenesis | Spermiogenesis |
|--------------------------------------|--|
| Process of formation of spermatozoa. | Process of differentiation of spermatozoon from a spermatid. |
- b)
- | Spermatogenesis | Spermiogenesis |
|--|---|
| It changes a haploid structure into another haploid structure. | It involves conversion of a diploid structure into haploid structure. |
- c)
- | Spermatogenesis | Spermiogenesis |
|-----------------------------|----------------------------------|
| Growth and divisions occur. | Divisions and growth are absent. |
- d)
- | Spermatogenesis | Spermiogenesis |
|---|--|
| A spermatogonium forms four spermatozoa | A spermatid forms a single spermatozoon. |
86. Bartholin's are situated
a) on either side of vagina in humans b) on either side of vas deferens in humans
c) on either side of penis in humans d) on either side of Fallopian tube in humans.
87. Middle piece of mammalian sperm possesses _____
a) mitochondria and centriole b) mitochondria only c) centriole only
d) nucleus and mitochondria
88. Ovulation in the human female normally takes place during the menstrual cycle

- a) at the mid secretory phase b) just before the end of the secretory phase
c) at the beginning of the proliferative phase d) at the end of the proliferative phase
89. How many sperms are formed from a secondary spennatocyte?
a) 4 b) 8 c) 2 d) 1
90. In vitro fertilisation is a technique that involves transfer of which one of the following into the fallopian tube?
a) Embryo only upto 8 cell stage b) Either zygote or early embryo upto 8 cell stage
c) Ernbro of 32 cell stage d) Zygote only
91. Which of the following statements concerning menopause is correct?
a)
Menopause occurs because all of the female's follicles become hormone producing corpus luteum at once.
b) Menopausal symptoms are a result of decrease in the production of FSH and LH.
c) The onset of menopause is primarily due to follicle atresia. d) All of these
92. For human female which of the following is incorrect?
a) Menstrual cycle takes 28 days on an average.
b) Menopause occurs at 45-55 years of age. c) The eggs released during pregnancy die.
d) Menstruation takes 4 days on an average.
93. The process of release of spermatozoa from Sertoli cells into cavity of the seminiferous tubules is called
a) spermiogenesis b) spermatogenesis c) spermatocytogenesis d) spermiation
94. The nutritive cells found in seminiferous tubules are
a) Leydig's cells b) atretic follicular cells c) Sertoli cells d) chromaffin cells.
95. The correct sequence of spermatogenetic stages leading to the formation of sperms in a mature human testes is _____
a) spermatogonia -spermatocyte -spermatid -sperms
b) spermatid -sperrnatocyte -spermatogonia - sperms
c) spermatogonia -spermatid -spermatocyte - sperms
d) spermatoclte -spermatogonia -spennatid - sperms
96. In a normal pregnant woman, the amount of total gonadotropin activity was assessed. The result expected was _____.
a) High level of circulating FSH and LH in the uterus to stimulate implantation of the embryo.
b) High level of circulatting HCG to stimulate endometrial thickening.
c) High level of FSH and LH in uterus to stimulate endometrical thickening
d) High level of circulating HCG to stimulate estrogen and progesterone synthesis.
97. If mammalian ovum fails to get fertilised, which one of the following is unlikely?
a) Corpus luteum will disintegrate. b) Progesterone secretion rapidly declines.
c) Estrogen secretion increases d) Primary follicle starts developing.
98. Which of the following layers in an antral follicle is a cellular?

a) Theca interna b) Stroma c) Zona pellucida d) Granulosa

99. Match between the following representing parts of the sperm and their functions and choose the correct option.

Column A	Column B
A. Head	(i) Enzymes
B. Middle piece	(ii) Sperm motility
C. Acrosome	(iii) Energy
D. Tail	(iv) Genetic material

a) A-(ii), B-(iv), C-(i), D-(iii) b) A-(iv), B-(iii), C-(i), D-(ii) c) A-(iv), B-(i), C-(ii), D-(iii)
d) A-(ii), B-(i), C-(iii), D-(iv)

100. Which of the following is correct about mammalian testes?

a) Graafian follicles, Sertoli cells, Leydig's cells
b) Graafian follicles, Sertoli cells, Seminiferous tubules
c) Sertoli cells, Seminiferous tubules, Leydig's cells
d) Graafian follicle, Leydig's cells, Seminiferous tubule

101. Delivery of developed fetus is scientifically called

a) parturition b) oviposition c) abortion d) ovulation

102. In the development of the human body, the ectoderm is responsible for the formation of:

a) lens of the eye b) nervous system c) sweat glands d) all of these

103. Eye lens is formed from _____

a) ectoderm b) mesoderm c) endoderm d) Both (a) and (b)

104. Acrosome is a type of

a) lysosome b) flagellum c) ribosome d) basal body

105. The difference between spermiogenesis and spermiation is _____

a)

In spermiogenesis, spermatozoa from Sertoli cells are released into the cavity of seminiferous tubules. while in spermiation spermatozoa are formed

b) In spermiogenesis, spermatozoa are formed, while in spermiation spermatids are formed

c) In spermiogenesis, spermatids are formed, while in spermiation spermatozoa are formed

d)

In spermiogenesis, spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules

106. Fertilisation is defined as the process by which

a) a diploid spermatozoon unites with a haploid ovum to form a triploid zygote
b) a haploid spermatozoon unites with a haploid ovum to form a diploid zygote
c) a diploid spermatozoon unites with a diploid ovum to form a diploid zygote
d) a diploid spermatozoon unites with a haploid ovum to form a diploid zygote.

107. Besides activating the egg, another role of a sperm is to carry to egg

a) RNA b) mitochondria c) DNA d) ribosomes

108. Assertion: The shape of the uterus is like an inverted pear.

Reason: The inner glandular layer that lines the uterine cavity is called as myometrium.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
109. During proliferative phase, uterine wall undergoes certain changes, these are
a) myometrium wall is sloughed off b) endometrium wall is sloughed off
c) blood vessels in endometrium become long and coiled
d) proliferation of myometrial epithelial lining.
110. Consider the following three statements related to the human male reproductive system and select the correct option stating which ones are true (T) and which ones are false (F).
(i) Middle piece of spermatozoon is also termed as power house of spermatozoon.
(ii) Vas deferens joins a duct from seminal vesicle and form vasa efferentia.
(iii) Semen is a collection of secretions from the seminal vesicles, prostate gland and Cowper's glands and sperms from testes.
- | | | | |
|--------------|--------------|--------------|--------------|
| a) | b) | c) | d) |
| (i)(ii)(iii) | (i)(ii)(iii) | (i)(ii)(iii) | (i)(ii)(iii) |
| T F T | F F T | T T F | F T T |
111. Assertion : The embryo with 8 to 16 blastomeres is called a morula.
Reason: The morula continues to divide and transforms into trophoblast.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
112. Level of follicle stimulating hormone (FSH) during infancy and adulthood is the same but spermatogenesis is seen only during adulthood. mRNA levels coding for FSH receptors are also found to be same in testis of both age groups. Which of the following investigations will clarify this paradox a little more?
a) Culture testicular cells and add LH to see testosterone production.
b)
Culture testicular cells and add testosterone to see comparative rise in FSH mRNA from both age groups.
c)
Culture testicular cells and FSH to see comparative rise in cAMP production by both age groups.
d) Add both LH and FSH to testicular cells and evaluate cAMP production.
113. Prostate glands are located below
a) gubernaculum b) seminal vesicles c) epididymis d) bulbourethral glands
114. Identify the odd one from the following.
a) Labia minora b) Fimbriae c) Infundibulum d) Isthmus
115. Withdrawal of which of the following hormones is the immediate cause of menstruation?
a) (a) FSH (b) (c) (d) b) FSH-RH c) Progesterone d) Estrogen

116. A sex gland which contributes fluid containing sugar fructose that provides spermatozoa energy for swimming and hormone prostaglandins that stimulate contractions in the female reproductive tract to aid sperm-ovum interaction is
a) Cowper's gland b) prostate gland c) seminal vesicle d) preputial gland

117. Fetus gets nourishment and oxygen through
a) allantois b) placenta c) yolk sac d) chorion

118. Match column I with column II and select the correct option from the codes given below.

Column - I	Column - II
A. Hypothalamus	(i) Sperm lysins
B. Acrosome	(ii) Estrogen
C. Graafian follicle	(iii) Relaxin
D. Leydig's cells	(iv) GnRH
E. Parturition	(v) Testosterone

- a) A-(iv), B-(i), C-(ii), D-(iii), E-(v) b) A-(ii), B-(i), C-(iv), D-(iii), E-(v)
c) A-(ii), B-(i), C-(v), D-(iv), E-(iii) d) A-(iv), B-(i), C-(ii), D-(v), E-(iii)
119. What is true about cleavage in fertilised egg of human?
a) Meroblastic b) Starts when egg reaches uterus c) Starts in Fallopian tube
d) It is identical to normal mitosis
120. Assertion: Human male ejaculates about 50-100 million sperms during a coitus.
Reason: For normal fertility at least 40 percent sperms must have normal shape and size.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
121. The stage during which separation of the paired homologous chromosomes begins is _____.
a) diakinesis b) diplotene c) pachytene d) zygotene
122. Fertilisation in humans is practically feasible only if _____.
a) the sperms are transported into vagina just after the release of ovum in fallopian tube
b) the ovum and sperms are transported simultaneously to ampullary isthmic junction of the fallopian tube.
c) the ovum and sperms are transported simultaneously to ampullary - isthmic junction of the cervix
d) the sperms are transported into cervix within 48 hrs of release of ovum in uterus.
123. Which extra-embryonic membrane in humans for events desiccation of the embryo inside the uterus?
a) Chorion b) Allantois c) Yolk sac d) Amnion
124. In humans, at the end of the first meiotic division, the male germ cells differentiate into the _____.
a) primary spermatocytes b) secondary spermatocytes c) spermatids d) spermatozoa

125. Which one of the following generates new genetic combinations leading to variation?
a) Vegetative reproduction b) Parthenogenesis c) Sexual reproduction
d) Nucellar polyembryony
126. What is true about cleavage in the fertilised egg in humans?
a) it starts while the egg is in Fallopian tube b) it starts when the egg reaches uterus.
c) It is meroblastic. d) It is identical to the normal mitosis.
127. In the 28 days human ovarian cycle, the ovulation takes place typically on
a) day 1 of the cycle b) day 14 of the cycle c) day 5 of the cycle d) day 28 of the cycle
128. Which part of ovary in mammals acts as an endocrine gland after ovulation?
a) Stroma b) Germinal epithelium c) Vitelline membrane d) Graafian follicle
129. Location and secretion of Leydig's cells are _____.
a) liver - cholesterol b) ovary - estrogen c) testis - testosterone d) pancreas - glucagon
130. Identify the human developmental stage shown as well as the related right place of its occurrence in a normal pregnant woman and select the right option for the two, together.



a)

Developmental stage	Site of occurrence
Late morula	Middle part of Fallopian tube

b)

Developmental stage	Site of occurrence
Blastula	End part of Fallopian tube

c)

Developmental stage	Site of occurrence
Blastocyst	Uterine wall

d)

Developmental stage	Site of occurrence
8-celled morula	Starting point of Fallopian tube

131. hCG, hPL and relaxin are produced in women:
a) at the time of puberty b) only during pregnancy c) at the time of menopause
d) during menstruation.
132. If for some reason, the vasa efferentia in the human reproductive system gets blocked, the gametes will not be transported from _____.
a) testes to epididymis b) epididymis to vas deferens c) ovary to uterus
d) vagina to uterus
133. Consider the following statements each with two blanks.
(A) Seminiferous tubules produce (i) while Leydig's cells produce (ii).
(B) In females, urethra is small and conducts (iii) while in males it conducts urine and (iv).
(C) The process of formation of spermatozoa from spermatogonia is called (v) and the process

of maturation of spermatids into spermatozoa is called (vi).

Which one of the following options, gives the correct fill ups for the respective blank numbers from (i) to (vi) in the statements?

- a) (i)-spermatozoa, (ii)-testosterone, (v)-spermatogenesis, (vi)-spermiogenesis
 - b) (i)-testosterone, (ii)-spermatozoa, (iii)-urine, (iv)-semen
 - c) (i)-estrogen, (ii)-testosterone, (v)-spermiogenesis, (vi)-spermatogenesis
 - d) (iii)-urine, (iv)-semen, (v)-spermiogenesis, (vi)-spermatogenesis
134. Immediately after ovulation, the mammalian egg is covered by a membrane known as
a) chorion b) zona pellucida c) corona radiata d) vitelline membrane.
135. Fill the blanks in the given statements and select the correct option.
A. The developmental stage of an animal passed in the mother's womb is called (i).
B. The outer layer of blastula is called (ii) It does not take part in the formation of (iii).
C. (iv) the first germ layer formed from the inner cell mass by differentiation.
a) (ii)-mesoderm, (iii)-embryo proper, (iv)-ectoderm
b) (i)-embryo, (ii)-trophoblast, (iii)-embryo proper c) (i)-egg, (iv)-endoderm
d) (i)-embryo, (iv)-ectoderm
136. Given below are four statements each with one or two blanks. Select the option which correctly fills up the blanks in any two statements.
(A) The embryo with 8 to 16 blastomeres is called a (i).
(B) Embedding of the (i) in the endometrium of the uterus is called implantation and it leads to (ii).
(C) After implantation, finger like projections appear on the trophoblast called (i) which are surrounded by the (ii) and maternal blood.
(D) Inner cell mass contains certain cells called (i) cells which have the potency to give rise to all the tissues and organs.
a) (A)-(i) blastula, (C)-(i) chorionic villi, (ii)-uterine tissue
b) (B)-(i) blastocyst, (ii) pregnancy, (D)-(i) stem c) (A)-(i) morula, (D)-(i) Sertoli
d) (B)-(i) morula, (ii) parturition, (C)-(i) fimbriae, (ii)-embryonic tissue
137. The secretory phase in human menstrual cycle is luteal phase. Refer diagram
a) The secretory phase in human menstrual cycle is luteal phase. Refer diagram
b) All sperms except the one nearest to the ovum lose their tails
c) Cells of corona radiata trap all the sperms except one
d) Only two sperms nearest the ovum penetrate zona pellucida.
138. The main function of trophoectoderm in mammalian embryo is
a) formation of future endoderm b) formation of the body of developing embryo
c) formation of future ectoderm d) formation of placenta.
139. The time for optimum chances of conception in a woman is _____ starting from the day of menstruation.
a) 1st day b) 4th day c) 14th day d) 26th day
140. The sex of the fetus will be decided at

- a) fertilisation by male gamete b) implantation c) fertilisation by female gamet
d) the start of cleavage
141. A temporary endocrine gland in the human body is:
a) Pineal gland b) Corpus cardiacum c) Corpus luteum d) Corpus allatum
142. The structures derived from ectoderm are
(i) pituitary gland, (ii) cornea, (iii) kidneys, (iv) notochord
a) (i) and (iii) b) (ii) and (iii) c) (i) and (ii) d) (ii) and (iv),
143. Foetal ejection reflex in human female is induced by _____
a) release oxytocin from pituitary b) fully developed foetus and placenta
c) differentiation of mammary glands d) pressure exerted by amniotic fluid
144. The main function of mammalian corpus luteum is to produce _____
a) estrogen only b) progesterone c) human chorionic gonadotropin d) relaxin only
145. The shared terminal duct of the reproductive and urinary system in the human male is _____
a) Urethra b) Ureter c) Vas deferens d) Vasa efferentia
146. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Hyaluronidase	(i) Acrosomal reaction
B. Corpus luteum	(ii) Morphogenetic movements
C. Gastrulation	(iii) Progesterone
D. Capacitation	(iv) Mammary gland
E. Colostrum	(v) Sperm activation

- a) A-(v). B-(ii), C-(iv), D-(i), E-(iii) b) A-(i), B-(iii), C-(ii), D-(v). E-(iv)
c) A-(iii), B-(ii), C-(v), D-(iv), E-(i) d) A-(i), B-(ii), C-(iii), D-(iv), E-(v)
147. Identify the human development stage shown below as well as the related right place of its occurrence in a normal pregnant woman and select the right option for the two together.



a)

Developmental stage	Site of occurrence
Late morula	Middle part of Fallopian tube

b)

Developmental stage	Site of occurrence
Blastula	End part of Fallopian tube

c)

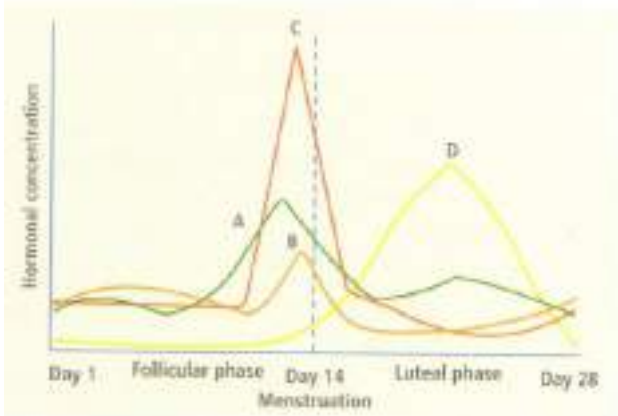
Developmental stage	Site of occurrence
Blastocyst	Uterine wall

d)

Developmental stage	Site of occurrence
8 - celled morula	Starting point of Fallopian tube

148. Read the following statements about menstrual cycle and select two correct statements.
- (i) Lack of menstruation may be indicative of pregnancy.
 - (ii) The changes in the ovary and the uterus are induced by changes in the levels of ovarian hormones only.
 - (iii) LH surge induces ovulation.
 - (iv) If fertilisation occurs, corpus luteum degenerates immediately
- a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (ii) and (iv)
149. Identify the correct statement from the following.
- a) High levels of estrogen triggers the ovulatory surge.
 - b) Oogonial cells start to proliferate and give rise to functional ova in regular cycles from puberty onwards.
 - c) Sperms released from seminiferous tubules are highly motile.
 - d) Progesterone level is high during the post-ovulatory phase of menstrual cycle
150. The immature male germ cells undergo division to produce sperms by the process of spermatogenesis. Choose the correct one with reference to above.
- a) Spermatogonia have 46 chromosomes and always undergo meiotic cell division.
 - b) Primary spermatocytes divide by mitotic cell division.
 - c) Secondary spermatocytes have 23 chromosomes and undergo second meiotic division.
 - d) Spermatozoa are transformed into spermatids.
151. Which one of the following is the correct matching of the events occurring during menstrual cycle?
- a) Proliferative phase: Rapid regeneration of myometrium and maturation of Graffian follicle.
 - b) Development of corpus luteum : Secretory phase and increased secretion of progesterone.
 - c) Menstruation: Breakdown of myometrium and ovum not fertilised.
 - d) Ovulation: LH and FSH attain peak level and sharp fall in the secretion of progesterone.
152. Some important events that occur during the menstrual cycle are given below. Arrange the events in a proper sequence and Select the correct option.
- (i) Proliferation of endometrial wall
 - (ii) LH surge
 - (iii) Secretion of estrogen
 - (iv) Secretion of progesterone
 - (v) Ovulation
 - (vi) Growth of corpus luteum
 - (vii) Degeneration of corpus luteum
 - (viii) Menstruation
- a) (ii) → (iv) → (iii) → (i) → (vii) → (v) → (viii) → (vi)
 - b) (iii) → (i) → (ii) → (v) → (vi) → (iv) → (vii) → (viii)
 - c) (v) → (i) → (vi) → (viii) → (iii) → (iv) → (vii) → (ii)
 - d) (ii) → (v) → (vi) → (i) → (viii) → (vii) → (iii) → (iv)

153. Refer to the given graph representing interplay of different hormones (A-D) during menstrual cycle in women and answer the questions that follow.



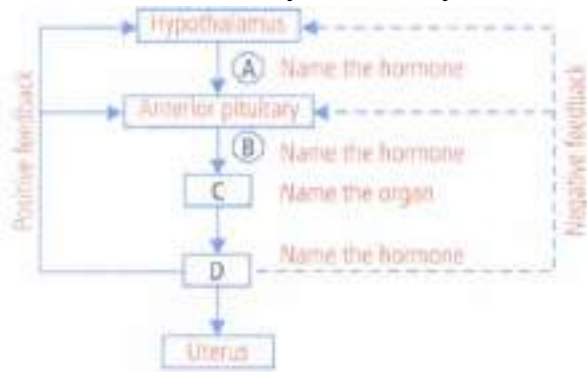
Cessation of secretion of which of these hormones may lead to osteoporosis?

- a) A b) B c) C d) D
154. In oocyte secondary maturation occurs in:
a) ovary b) abdominal cavity c) Fallopian tube d) uterus
155. In ovary we can find
(i) primary follicle, (ii) Graafian follicle, (iii) blood vessel, (iv) corpus luteum
a) (i) and (ii) b) (ii), (iii) and (iv) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)
156. Assertion: During pregnancy the levels of hormones like estrogens and progestrogens are increased.
Reason: The increased production of these hormones is essential for fetal growth.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
157. The middle piece of the sperm contains
a) proteins b) mitochondria c) centriole d) nucleus
158. Sertoli cells are regulated by the pituitary hormone known as
a) LH b) FSH c) GH d) prolactin
159. Spermiogenesis is the process of the release of sperms from
a) seminiferous tubules b) vas deferens c) epididymis d) prostate gland.
160. Extra-embryonic membranes of the mammalian embryo are derived from _____.
a) (a) inner cell mass (b) (c) (d) b) trophoblast c) formative cells d) follicle cells
161. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
Cleavage	Fertilisation
Morula	Mitotic divisions
Polyspermy	Endometrial
Implantation	Little mulberry

- a) A-(ii), B-(iv), C-(i), D-(iii) b) A-(i), B-(iv), C-(ii), D-(iii) c) A-(i), B-(iv), C-(ii), D-(iii)
d) A-(i), B-(iv), C-(iii), D-(i)

162. Given below is an incomplete flow chart showing influence of hormones on gametogenesis in human females. Study it carefully and identify A, B, C and D



a)

A	B	C	D
FSH	LH	Ovary	Progesterone

b)

A	B	C	D
GnRH	FSH and LH	Ovary	Estrogen and Progesterone

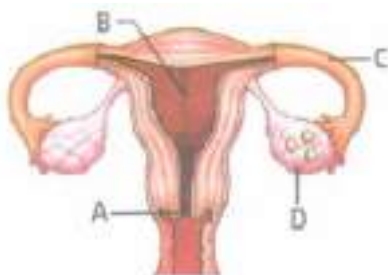
c)

A	B	C	D
GnRH	FSH	Testis	Testosterone

d)

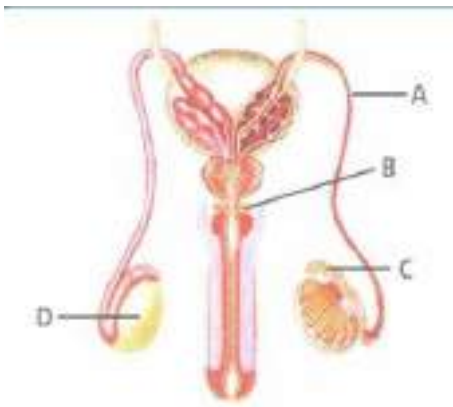
A	B	C	D
LH	FSH	Testis	Testosterone

163. Cleavage differs from mitosis in lacking
a) synthetic phase b) growth phase c) both (a) and (b) d) none of these
164. Read the given statements and select the correct option.
Statement 1 : In a Graafian follicle, the primary oocyte and the follicle cells may be regarded sibling cells.
Statement 2 : Both arise from the same parent cell, the oogonium, by mitotic divisions.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.
165. Implantation takes place after _____ of fertilisation.
a) 5 days b) 6 days c) 7 days d) 8 days
166. The given figure is of human female reproductive system. Identify the parts labelled as A, B, C and D and select the correct option.



- a) A-Oviduct, B-Uterus, C-Ovarian ligament, D-Ovary
b) A-Cervix, B-Uterus, C-Ovary, D- Tumour
c) A-Uterus, B-Uterine cavity, C-Oviducal funnel, D-Ovary
d) A-Cervix, B-Uterine cavity, C-Fallopian tube, D-Ovary

167. Read the following statements about the given diagram carefully and state which of them are correct?



- (i) A carries urine and sperms.
 - (ii) B secretes a fluid that helps in the lubrication of penis.
 - (iii) D produces testosterone but not sperms.
 - (iv) C stores sperms.
- a) (i) and (ii) b) (ii) and (iii) c) (ii) and (iv) d) (i) and (iv)

168. Read the following statements carefully and select the correct statements.

- (i) hPL plays a major role in parturition.
 - (ii) Fetus shows movements first time in the 7th month of pregnancy.
 - (iii) Signal for parturition comes from fully developed fetus and placenta.
 - (iv) Embryo's heart is formed by the 3rd month of pregnancy.
- a) (ii) and (iii) b) (iii) only c) (ii) and (iv) d) (i) and (iv)

169. Spot the odd one out from the following structures with reference to the male reproductive system.

- a) Rete testis b) Epididymis c) Vasa efferentia d) Isthmus

170. The accompanying diagram shows the changes that take place in the endometrium during a normal menstrual cycle. Identify the changes and select the correct option.



- a)
- | Ovulation | Menstruation |
|-----------|--------------|
| A | B |
- b)
- | Ovulation | Menstruation |
|-----------|--------------|
| A | C |
- c)
- | Ovulation | Menstruation |
|-----------|--------------|
| C | A |
- d)
- | Ovulation | Menstruation |
|-----------|--------------|
| B | D |

171. Match the items given in Column I with those in Column- II and select the correct option given below.

Column I	Column II
----------	-----------

A Proliferative phase	I Breakdown of endometrial lining
B Secretory phase	II Follicular phase
C Menstruation	III Luteal phase

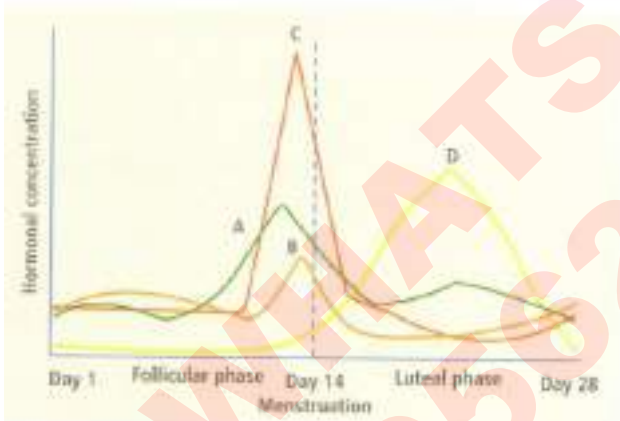
a)	b)	c)	d)
ABC	ABC	ABC	ABC
II III I	I III II	III II I	III I II

172. Fill up the blanks in the following paragraph by selecting the correct option.

(i) are the primary female sex organs that produce (ii) and (iii). Each primary sex organ is about (iv) in length and is connected to the pelvic wall and uterus by (v)

a)	b)
(i) (ii) (iii) (iv) (v)	(i) (ii) (iii) (iv) (v)
(a) Testes sperm hormones 4-5 cm ligaments	(b) Ovaries oogonia follicles 2-4 cm muscles
c)	d)
(i) (ii) (iii) (iv) (v)	(i) (ii) (iii) (iv) (v)
(c) Ovaries ovum hormones 2-4 cm ligaments	(d) Testes sperm testosterone 8-9 cm muscles

173. Refer to the given graph representing interplay of different hormones (A-D) during menstrual cycle in women and answer the questions that follow.



Which hormone is most effective in producing uterine changes during menstrual cycle?

a) A b) B c) C d) D

174. The vas deferens receives duct from the seminal vesicle and opens into urethra a

a) epididymis b) ejaculatory duct c) efferent ductule d) ureter

175. In human females, meiosis-II is not complete until _____

a) fertilisation b) uterine implantation c) birth d) Puberty

176. Match the following and choose the correct option.

A. Trophoblast	(i) Embedding of blastocyst in the endometrium
B. Cleavage	(ii) Group of cells that would differentiate as embryo
C. Inner cell mass	(iii) Outer layer of blastocyst attached to the endometrium
D. Implantation	(iv) Mitotic division of zygote

a) A-(ii), B-(i), C-(iii), D-(iv) b) A-(iii), B-(iv), C-(ii), D-(i) c) A-(iii), B-(i), C-(ii), D-(iv)
d) A-(ii), B-(iv), C-(iii), D-(i)

177. Some important events that take place during fertilisation are given below. Arrange the events in a proper sequence and select the correct option.

(i) Cortical reaction

(ii) Sperm entry

(iii) Karyogamy

(iv) Acrosomal reaction

a) (iv) → (i) → (ii) → (iii) b) (i) → (ii) → (iii) → (iv) c) (iv) → (ii) → (i) → (iii)

d) (ii) → (i) → (iii) → (iv)

178. Assertion : All copulations do not lead to the fertilisation and pregnancy.

Reason: Fertilisation can occur only if the ovum and sperms are transported simultaneously to the ampullary isthmic junction.

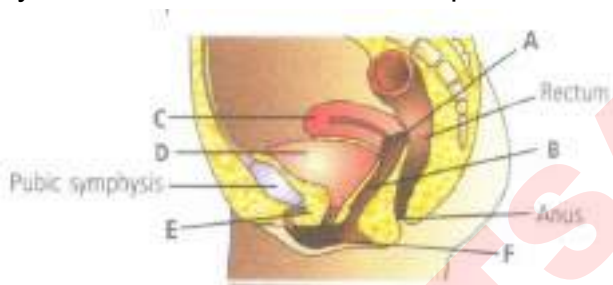
a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

179. Identify the parts labelled as A to F from the given diagram of human female reproductive system and select the correct option.



a) A-Cervix, B-Vagina, C-Uterus, D-Urinary bladder, E-Clitoris, F-Vaginal orifice

b) A-Vagina, B-Cervix, C-Urinary bladder, D-Uterus, E-Vaginal orifice, F-Clitoris

c) A-Urethra, B-Vagina, C-Urinary bladder, D-Cervix, E-Uterus, F-Clitoris

d) A-Vaginal orifice, B-Cervix, C-Uterus, D-Urethra, E-Clitoris, F-Urinary bladder

180. Which of these is not an important component of initiation of parturition in humans?

a) Increase in estrogen and progesterone ratio b) Synthesis of prostaglandins

c) Release of oxytocin d) Release of prolactin

181. In the human female, menstruation can be deferred by the administration of _____.

a) combination of FSH and LH b) combination of estrogen and progesterone c) FSH only

d) LH only

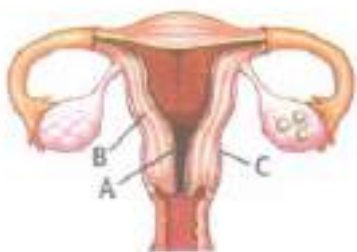
182. Preparation of sperm before penetration of ovum is

a) spermiation b) cortical reaction c) spermiogenesis d) capacitation

183. Cells become variable in morphology and function in different regions of the embryo. The process is _____

a) differentiation b) metamorphosis c) organisation d) rearrangement

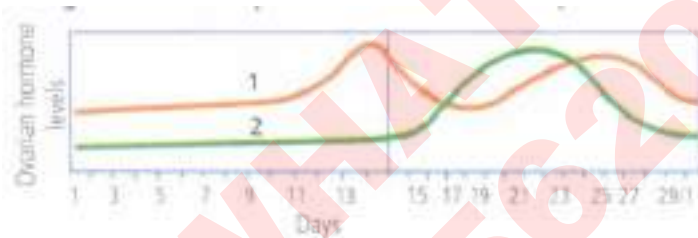
184. The given figure shows female reproductive system. Which wall of the uterus (A, B or C) sloughs off during menstruation?



- a) A b) B c) C d) All of these
185. $2n = 16$ is in a primary spermatocyte which is in metaphase of first meiotic division. What shall be the total number of chromatids in each of the secondary spermatocyte?
a) 16 b) 24 c) 32 d) 8
186. Choose the incorrect statement from the following.
a) In birds and mammals internal fertilisation takes place.
b) Colostrum contains antibodies and nutrients.
c) Polyspermy in mammals is prevented by the chemical changes in the egg surface.
d) In the human female, implantation occurs almost seven days after fertilisation.
187. Assertion : After implantation, finger-like projections appear on the trophoblast called chorionic villi.
Reason: Chorionic villi are surrounded by the uterine tissue and maternal blood.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
188. Mark the odd item in each series and select the correct option.
- (i) Spermatocyte; polar body; spermatid; spermatogonium
(ii) Endometrium; corpus luteum; acrosome; Graafian follicle
(iii) Vas deferens; Fallopian tube; epididymis; Cowper's gland
(iv) Testes; prostate; seminal vesicles; Cowper's gland
- a)
- | (i) | (ii) | (iii) | (iv) |
|-----------|-------------|------------|----------|
| Spermatid | Endometrium | Epididymis | Prostate |
- b)
- | (i) | (ii) | (iii) | (iv) |
|------------|----------|----------------|--------|
| Polar body | Acrosome | Fallopian tube | Testes |
- c)
- | (i) | (ii) | (iii) | (iv) |
|--------------|---------------|--------------|----------------|
| Spermatocyte | Corpus luteum | Vas deferens | Cowper's gland |
- d)
- | (i) | (ii) | (iii) | (iv) |
|----------------|-------------------|----------------|------------------|
| Spermatogonium | Graafian follicle | Cowper's gland | Seminal vesicles |
189. Which of the following options is correct?
- a)
- | Haploid | Diploid |
|------------------|----------------------|
| Secondary oocyte | Primary spermatocyte |
- b)
- | Haploid | Diploid |
|------------------------|------------------|
| Secondary spermatocyte | Secondary oocyte |
- c)
- | Haploid | Diploid |
|----------------|------------------------|
| Primary oocyte | Secondary spermatocyte |
- d)
- | Haploid | Diploid |
|---------|-----------|
| Ovum | Spermatid |
190. Which of the following hormones is not secreted by human placenta?
a) hCG b) Estrogens c) Progesterone d) LH
191. The function of the secretion of prostate gland is to
a) inhibit sperm activity b) attract sperms c) stimulate sperm activity d) none of these.

192. Which of the following hormone levels will cause release of ovum (ovulation) from the graafian follicle ?
 a) Low concentration of LH b) Low concentration of FSH
 c) High concentration of Estrogen d) High concentration of Progesterone
193. Which of the following cells during gametogenesis is normally diploid?
 a) Primary polar body b) Spermatid c) Spermatogonia d) Secondary polar body
194. In 28 days human ovarian cycle, ovulation occurs on _____.
 a) 1 day b) 5 days c) 14 days d) 28 days
195. Freshly released human egg has _____.
 a) one Y-chromosome b) one X-chromosome c) two X-chromosomes
 d) Both (a) and (b)
196. Assertion: The middle piece is called as power house of the sperm.
 Reason : The numerous mitochondria coiling around axial filament produce energy for the movement of the tail.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
197. Match column I with column II and select the correct option from the codes given below.
- | Column I | Column II |
|------------------|----------------------------|
| A. Fertilisation | (i) Isthmus of oviduct |
| B. Cleavage | (ii) Later part of oviduct |
| C. Morula | (iii) Cervix |
| D. Blastocyst | (iv) Ampulla of oviduct |
| E. Parturition | (v) Uterine wall |
- a) A-(iv), B-(i), C-(ii), D-(iii), E-(v) b) A-(ii), B-(i), C-(iv), D-(iii), E-(v)
 c) A-(ii), B-(i), C-(v), D-(iv), E-(iii) d) A-(iv), B-(i), C-(ii), D-(v), E-(iii)
198. A reaction of granules content which harden the zona pellucida and ensures sure block to polyspermy is:
 a) acrosomal reaction b) cortical reaction c) acrosin reaction d) bindin reaction
199. Egg is liberated from ovary in _____.
 a) secondary oocyte stage b) primary oocyte stage c) oogonial stage
 d) mature ovum stage
200. Which of the following layers in an antral follicle is a cellular?
 a) Granulosa b) Theca interna c) Stroma d) Zona pellucida
201. Which one of the following statements about human sperm is correct?
 a) Acrosome has a conical pointed structure used for piercing and penetrating the egg, resulting in fertilisation.
 b) The sperm lysins in the acrosome dissolve the egg envelope facilitating fertilisation.
 c) Acrosome serves as a sensory structure leading the sperm towards the ovum.
 d) Acrosome serves no particular function.

202. Temperature of the scrotum which is necessary for the functioning of testis is always around _____ below body temperature.
a) 2°C b) 4°C c) 6°C d) 8°C
203. Seminal plasma in human males is rich in _____
a) fructose and calcium. b) glucose and calcium c) DNA and testosterone
d) ribose and potassium
204. Milk secreted from the cells of alveoli of mammary lobes reaches nipple through lactiferous duct (L), mammary duct (M), mammary tubule (T) and mammary ampulla (A) in the following order
a) TMAL b) MTLA c) MTAL d) ATML
205. If mammalian ovum fails to get fertilized, which one of the following is unlikely?
a) Corpus luteum will disintegrate b) Progesterone secretion rapidly declines
c) Estrogen secretion further decreases d) Primary follicle starts developing
206. Which of the following depicts the correct pathway of transport of sperms?
a) Rete testis -> efferent ducts -> Epididymis -> Vas deferens
b) Rete testis -> Epididymis -> efferent ducts -> Vas deferens
c) Rete testis -> Vas deferens -> efferent ducts -> Epididymis
d) Efferent ducts -> Rete testis -> Vas deferens -> Epididymis
207. The following graph shows the levels of ovarian hormones during a menstrual cycle. What do 1 and 2 represent?



- a)

1	2
Progesterone	Estrogen

 b)

1	2
FSH/LH	

 c)

1	2
LH/FSH	

 d)

1	2
Estrogen	Progesterone
208. The third Stage of parturition is called "after - birth" in this stage:
a) excessive bleeding occurs
b) fetus is born and cervix and vagina contraction to normal condition happens
c) fetus is born and contraction of uterine wall prevents excessive bleeding
d) placenta is expelled out.
209. A regular cycling woman is not menstruating. Which one of the following is the most likely root cause of this?
a) Maintenance of the hypertrophical endometrial lining
b) Maintenance of high concentration of sex-hormones in the blood stream
c) Retention of well-developed corpus luteum d) Fertilisation of the ovum
210. Match the items given in Column I with those in Column II and select the correct option given below:

- a) Proliferative Phase (i) Breakdown of endometrial lining
b) Secretory phase (ii) Follicular Phase c) Menstruation (iii) Luteal Phase
d) Corpus cardiacum
211. During the development of embryo, which of the following occurs first?
a) Differentiation of organ b) Differentiation of tissue c) Differentiation of organ system
d) Differentiation of cells
212. At menopause there is rise in urinary excretion of:
a) FSH b) STH c) MSH d) none of these
213. After ovulation Graafian follicle regresses into
a) corpus atresia b) corpus callosum c) corpus luteum d) corpus albicans
214. A cross section at the midpoint of the middle piece of a human sperm will show
a) centriole, mitochondria and 9 + 2 arrangement of microtubules
b) centriole and mitochondria c) mitochondria and 9 + 2 arrangement of microtubules
d) 9 + 2 arrangement of microtubules only
215. Which one of the following is not the function of placenta?
a) Facilitates removal of carbon dioxide and waste material from embryo
b) Secretes oxytocin during parturition
c) Facilitates supply of oxygen and nutrients to embryo d) Secretes estrogen
216. Below is given the unorganised list of some important events in the human female reproductive cycle. Identify the correct sequence of these events and select the correct option.
(i) Secretion of FSH
(ii) Growth of corpus luteum
(iii) Growth of the follicle
(iv) Ovulation
(v) Sudden increase in the levels of LH
a) (i) → (iv) → (iii) → (v) → (ii) b) (ii) → (i) → (iii) → (iv) → (v)
c) (iii) → (i) → (iv) → (ii) → (v) d) (i) → (iii) → (v) → (iv) → (ii)
217. In spermatogenesis, reduction division of chromosome occurs during conversion of
a) spermatogonia to primary spermatocytes
b) primary spermatocytes to secondary spermatocytes
c) secondary spermatocytes to spermatids d) spermatids to sperms
218. Which one of the following is the correct matching of the events occurring during menstrual cycle?
a) Proliferative phase : Rapid regeneration of myometrium and maturation of Graafian follicle
b) Secretory phase : Development of corpus luteum and increased secretion of progesterone
c) Menstruation : Breakdown of myometrium and ovum not fertilised
d) Ovulation : LH and FSH attain peak level and sharp fall in the secretion of progesterone
219. In human female, the blastocyst:
a) Forms placenta even before implantation
b) Gets implanted into uterus 3 days after ovulation

- c) Gets nutrition from uterine endometrial secretion only after implantation.
 d) Gets implanted in endometrium by the trophoblast cell
220. The Leydig cells found in the human body are the secretory source of _____
 a) Progesterone b) intestinal mucus c) glucagon d) androgens
221. Name the hormone that has no role in menstruation.
 a) LH b) FSH c) Estradiol d) TSH
222. Capacitation occurs in _____
 a) Epididymis b) Vas deferens c) Female reproductive tract d) Rete testis
223. Fill up the blanks in the following paragraph by selecting the correct option.
 During copulation (coitus), semen is released by the penis into the vagina and is called.__(i)____
 The ovum released by the ovary is transported to the __(ii)____ where __(iii)____ takes place. During fertilisation, a sperm comes in contact with the zona pellucida layer of the ovum and induces changes in the membrane that block the entry of __(iv)____. The secretions of the __(v)____ help the sperm enter into the cytoplasm of the ovum.
- a)
- | | | | | |
|---------------|----------|--------------|------|--------------|
| (i) | (ii) | (iii) | (iv) | (v) |
| fertilisation | fimbriae | insemination | eggs | middle piece |
- b)
- | | | | | |
|--------------|----------------------------|---------------|-------------------|-----------|
| (i) | (ii) | (iii) | (iv) | (v) |
| insemination | ampullary isthmic junction | fertilisation | additional sperms | sacrosome |
- c)
- | | | | | |
|-----------|---------|---------------|------------------|------|
| (i) | (ii) | (iii) | (iv) | (v) |
| ovulation | ampulla | fertilisation | additional sperm | tail |
- d)
- | | | | | |
|-------------|---------|--------------|------|-----------|
| (i) | (ii) | (iii) | (iv) | (v) |
| parturition | isthmus | insemination | eggs | sacrosome |
224. In most mammals, the testes are located in scrotal sac for
 a) more space to visceral organs b) spermatogenesis c) sex differentiation
 d) independent functioning of kidney
225. The phase of menstrual cycle in humans that last for 7-8 days, is
 a) follicular phase b) ovulatory phase c) luteal phase d) menstruation
226. Which one of the following is the most likely root cause why menstruation is not taking place in regularly cycling human female?
 a) maintenance of the hyperlrophical endometrial lining
 b) maintenance of high concentration of sex hormones in the blood stream
 c) retention of well-developed corpus luteum d) fertilisation of the ovum
227. In telolecithal egg the yolk is found _____
 a) all over the egg b) on one side c) both the sides d) at centre
228. In human adult females, oxytocin:
 a) Causes strong uterine contractions during parturition b) Is secreted by anterior pituitary
 c) Stimulates growth of mammary glands d) Stimulates pituitary to secrete vasopressin
229. Repair of endometrium is undertaken by:

- a) LH b) FSH c) estrogen d) prolactin
230. The sperms undergo physiological maturation, acquiring increased motility and fertilising capacity in
a) seminiferous tubules b) vasa efferentia c) epididymis d) vagina
231. **Assertion :** The regions outside the seminiferous tubules are called interstitial spaces, which contain Leydig's cells.
Reason: Leydig's cells synthesise and secrete testicular hormones called androgens.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
232. In the event of pregnancy, the corpus luteum persists under the influence of
a) LH b) FSH c) chorionic gonadotropin d) progesterone
233. The following graph shows the levels of pituitary hormones during a menstrual cycle. What do 1 and 2 represent?
-
- a)

1	2
LH	FSH

 b)

1	2
Estrogen	Progesterone

 c)

1	2
FSH	LH

 d)

1	2
Progesterone	Estrogen
234. In oogenesis, a diploid cell produce _____ ovum/ova.
a) 1 b) 2 c) 3 d) 4
235. Capacitation refers to changes in the _____.
a) Orum before fertilisation b) Orum after fertilisation c) Sperm after fertilisation
d) Sperm before fertilisation
236. Select the correct option describing gonadotropin activity in a normal pregnant female.
a) High level of FSH and LH stimulates the thickening of endometrium.
b) High level of FSH and LH facilitate implantation of the embryo
c) High level of hCG stimulates the synthesis of estrogen and progesterone
d) High level of hCG stimulates the thickening of endometrium
237. Gonads develop from embryonic _____.
a) ectoderm b) endoderm c) mesoderm d) Both (b) and (c)
238. **Assertion:** Vigorous contraction of the uterus at the end of pregnancy causes expulsion.
Reason: The stimulatory reflex between the uterine contraction and oxytocin secretion results in weakening contractions.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
239. Grey crescent is the area _____

- a) at the point of entry of sperm into ovum
 b) just opposite to the site of entry of sperm into ovum
 c) at the animal Pole
 d) at the vegetal Pole

240. Pick the odd one out from each series given below and select the correct option.

- (i) Scrotum, rete testis, Fallopian tube, vas deferens
 (ii) Ovary, uterus, vagina, ejaculatory duct
 (iii) Acrosome, Graafian follicle, corpus luteum, cervix
 (iv) Prostate, testis, seminal vesicles, Cowper's gland

a)

(i)	(ii)	(iii)	(iv)
Vas deferens	Vagina	Cervix	Cowper's gland

b)

(i)	(ii)	(iii)	(iv)
Rete testis	Ovary	Graafian follicle	Prostate

c)

(i)	(ii)	(iii)	(iv)
Scrotum	Uterus	Corpus luteum	Seminal vesicles

d)

(i)	(ii)	(iii)	(iv)
Fallopian tube	Ejaculatory duct	Acrosome	Testis

241. Which of the following events is not associated with ovulation in human female?

- a) Full development of Graafian follicle
 b) Release of secondary oocyte
 c) LH surge
 d) Decrease in estradiol

242. Which among the following has 23 chromosomes?

- a) Spermatogonia
 b) Zygote
 c) Secondary oocyte
 d) Oogonia

243. The female external genitalia include

- (i) ovary
 (ii) mammary gland
 (iii) mons pubis
 (iv) clitoris
 (v) labia majora

- a) (i) and (ii)
 b) (ii) and (iii)
 c) (iii), (iv) and (v)
 d) (ii), (iii) and (v).

244. Match column I (terms) with column II (definitions) and select the correct option from the codes given below.

Column - I	Column - II
A. Parturition	(i) Attachment of embryo to endometrium
B. Gestation	(ii) Release of egg from Graafian follicle
C. Ovulation	(iii) Delivery of baby from uterus
D. Implantation	(iv) Duration between pregnancy and birth
E. Conception	(v) Formation of zygote by fusion of the egg and sperm
	(vi) Stoppage of ovulation and menstruation

- a) A-(ii), B-(iv), C-(i), D-(v), E-(vi)
 b) A-(iv), B-(iii), C-(i), D-(v), E-(ii)
 c) A-(v), B-(vi), C-(ii), D-(iii), E-(iv)
 d) A-(iii), B-(iv), C-(ii), D-(i), E-(v)

245. The membranous cover of the ovum at ovulation is

- a) corona radiata
 b) zona radiata
 c) zona pellucida
 d) chorion

246. Select the correct sequence for transport of sperm cells in male reproductive system
- a) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus
 - b) Seminiferous tubules → Vasa efferentia → Epididymis → Inguinal canal → Urethra
 - c) Testis → Epididymis → Vasa efferentia → Vas deferens → Ejaculatory duct → Inguinal canal → Urethra → Urethral meatus
 - d) Testis → Epididymis → Vasa efferentia J Rete → testis → Inguinal canal → Urethra
247. The sperm and the egg make different contributions to zygote. Which of the following statements about their contributions are true?
- (i) Sperm contributes most of the mitochondria
 - (ii) Egg contributes most of the cytoplasm
 - (iii) Both sperm and egg contribute haploid nucleus
 - (iv) Both sperm and egg contribute centrioles
- a) (iii) and (iv) b) (i), (ii), (iii) and (iv) c) (i) and (ii) d) (ii) and (iii)
248. Cessation of menstrual cycle in a woman is called
- a) lactation b) ovulation c) menopause d) parturition
249. The solid mass of 8-16 cells formed from zygote after successive mitotic divisions is called
- a) blastula b) gastrula c) morula d) none of these



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

REPRODUCTIVE HEALTH 1

Marks : 646

1. Which of the following STIs are not completely curable?
a) Chlamydiasis, gonorrhoea, trichomoniasis b) Chancroid, syphilis, genital warts
c) AIDS, syphilis, hepatitis B d) AIDS, genital herpes, hepatitis B
2. CuT is an intrauterine contraceptive device. Select the option that correctly defines the role of Cu.
a) Cu ions make uterus unsuitable for implantation.
b) Cu ions suppress sperm motility and the fertilising capacity of the sperms.
c) Cu ions make cervix hostile to sperms. d) All of these
3. **Assertion:** In barrier methods, ovum and sperms are prevented from physical meetings.
Reason: Barrier methods are used during coitus, to prevent the entry of ejaculated semen into the female reproductive tract.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
4. Which of the following statements are correct?
(i) Family planning programmes were initiated in 1951.
(ii) According to WHO, reproductive health means total well being in the physical, social, behavioural and emotional aspects of reproduction.
(iii) 'Saheli' was developed at CDRI in Lucknow.
(iv) Amniocentesis should not be banned as it is a foetal sex determination test.
a) (i) and (ii) only b) (ii) and (iii) only c) (i), (ii) and (iii) d) (iii) and (iv) only
5. In a species, the weight of newborn ranges from 2 to 5 kg. 97 % of the newborn with an average weight between 3 to 3.3kg survive whereas 99 % of the infants born with weights from 2 to 2.5 kg or 4.5 to 5 kg die. Which type of selection process is taking place?
a) Stabilizing selection b) Disruptive selection c) Cyclical selection
d) Directional selection
6. Progestin-estradiol combined contraceptive pills inhibit ovulation by
a) negative feedback on the release of estrogen from ovary required for follicular development in follicular phase
b) preventing the uterine physiological and morphological changes required for implantation

- c)
inhibiting the secretion of follicle stimulating hormone (FSH) and luteinising hormone (LH)
that are necessary for ovulation
d) both (a) and (c).
7. Read the given statements and select the correct option
Statement 1: Physiological capacity of organisms to produce offspring under natural conditions is called as reproductive potential.
Statement 2: Minimum number of individuals which an environment can sustain is referred to as its carrying capacity.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
8. The sexually transmitted infection, that can affect both the male and female genitals and may damage the eyes of babies born of infected mothers is
a) AIDS b) syphilis c) gonorrhoea d) hepatitis
9. Select the option which correctly fills up the blanks in the following statements,
(i) Destruction of embryo or foetus in the uterus is called _____.
(ii) Government of India legalised MTP in the year _____.
(iii) Natural family planning method is also called _____.
(iv) _____ is a method in which the male partner withdraws his penis from vagina just before ejaculation.
(v) _____ is a copper releasing and _____ is a hormone releasing intra uterine devices.
a) (i) foeticide, (ii) 1961, (iii) rhythm method, (iv) safety period, (v) Saheli, LNG-20
b) (i) foeticide, (ii) 1971, (iii) rhythm method, (iv) coitus interruptus, (v) Multiload 375, LNG-20
c) (i) foeticide, (ii) 1965, (iii) rhythm method, (iv) coitus interruptus, (v) Multiload 375, CuT
d)
(i) matricide, (ii) 1982, (iii) contraception method, (iv) coitus interruptus, (v) Progestasert, LNG-20
10. Hysteresctomy is surgical removal of _____
a) Prostate gland b) Vas-deference c) Mammary glands d) Uterus
11. In vitro fertilisation is a technique that involves transfer of which one of the following into the fallopian tube?
a) Embryo only up to 8 cell stage b) Either zygote or early embryo up to 8 cell stage
c) Embryo of 32 cells stage d) Zygote only
12. Given below are four methods (A-D) and their modes of action (i-iv) in achieving contraception. Select their correct matching from the four options that follow.

	Method		Mode of Action
A.	Oral pill	(i)	Prevents sperms reaching cervix
B.	Condom	(ii)	Suppresses sperm motility

C. Vasectomy	(iii)	Prevents ovulation
D. Copper T	(iv)	Semen contains no sperms

- a) A-(iii), B-(iv), C-(i), D-(ii) b) A-(ii), B-(iii), C-(i), D-(iv) c) A-(iii), B-(i), C-(iv), D-(ii)
d) A-(iv), B-(i), C-(ii), D-(iii)
13. Select the option including all sexually transmitted diseases _____
a) AIDS, Malaria, filaria b) Cancer, AIDS, syphilis c) Gonorrhoea, Syphilis, Cancer
d) Gonorrhoea, Syphilis, Genital Herpes
14. Which of the following is not a characteristic of an ideal contraceptive?
a) User-friendly b) Irreversible c) Easily available d) Least side-effects
15. Which one of the following statements is correct regarding sexually transmitted infections (STIs)?
a) A person may contact syphilis by sharing milk with one already suffering from the disease.
b) Haemophilia is one of the STIs c) Genital herpes and sickle-cell anaemia are both STIs.
d) None of these
16. Causes for increased population growth in India is/are
a) increase in birth rate b) decrease in death rate c) lack of education d) all of these.
17. Match the contraceptive methods given under column I with their examples given under column II and select the correct option from the given codes.
- | Column I | Column II |
|------------------|--|
| A. Chemical | (i) Tubectomy and vasectomy |
| B. IUDs | (ii) Copper T and loop |
| C. Barriers | (iii) Condom and cervical cap |
| D. Sterilisation | (iv) Spermicidal jelly and foam |
| | (v) Coitus interruptus and calendar method |
- a) A-(iv), B-(ii), C-(iii), D-(i) b) A-(iv), B-(v), C-(ii), D-(iii) c) A-(i), B-(iii), C-(ii), D-(v)
d) A-(iv), B-(ii), C-(v), D-(i)
18. **Assertion:** Intra cytoplasmic sperm injection (ICSI) is a procedure to form an embryo in vitro.
Reason: In ICSI, sperm is directly injected into the ovum.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
19. In context of Amniocentesis, which of the following statement is incorrect?
a) It is usually done when a woman is between 14-16 weeks pregnant.
b) It is used for prenatal sex determination
c) It can be used for detection of Down syndrome
d) It can be used for detection of Cleft palate
20. IUDs prevent pregnancy by
a) inhibiting physiological and morphological uterine changes required for implantation
b) increasing phagocytosis of spermatozoa within uterus

- c) suppressing motility of sperms as well as their fertilising capacity d) all of these
21. Which of the following two statements are correct?
(i) Medical termination of pregnancy (MTP) during first trimester is generally safe.
(ii) Generally chances of conception are nil until mother breast-feeds the infant upto two years.
(iii) Intrauterine devices like copper-T are effective contraceptives.
(iv) Contraception pills may be taken upto one week after coitus to prevent conception.
a) (i) and (iii) b) (i) and (ii) c) (ii) and (iii) d) (iii) and (iv)
22. **Assertion:** In vasectomy, a small part of the vas deferens is removed or tied up.
Reason: In tubectomy, a small part of the Fallopian tube is removed or tied up.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
23. **Assertion:** Sterilisation is a terminal method used only for males.
Reason: Sterilisation is highly effective and its reversibility is very good.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
24. The method of directly injecting a sperm into ovum in assisted reproductive technology is called
a) GIFT b) ZIFT c) ICSI d) ET
25. It is a disease which mainly affects mucous membrane of urinogenital tract. In males, burning feeling on passing urine, a yellow discharge accompanied by fever, headache and feeling of illness occurs. Its name is
a) phenylketonuria b) gonorrhoea c) AIDS d) none of these.
26. Which of the following represents the correct match of a sexually transmitted infection with its pathogen?
a) Syphilis- *Treponema pallidum* b) Gonorrhoea-*Entamoeba histolytica*
c) Urethritis-*Bacillus anthracis* d) Softsore-*Bacillus brevis*
27. Which of the following is correct regarding the consequences of over population?
a) It increases the poverty of a country. b) It leads to shortage of food supply.
c) It results in unemployment. d) All of these
28. Consider the following statements and select the option stating which ones are true (T) and which ones are false (F).
(i) Emigration is the movement of individuals out of a place or country.
(ii) Combined contraceptive pills contain synthetic progesterone and estrogen to check ovulation.
(iii) Depo-Provera are estrogen derivative injections.
(iv) The scientific study of human population is called demography.

a)

(i)	(ii)	(iii)	(iv)
T	T	F	T

b)

(i)	(ii)	(iii)	(iv)
T	F	T	F

c)

(i)	(ii)	(iii)	(iv)
T	F	F	T

d)

(i)	(ii)	(iii)	(iv)
T	F	T	T

29. On which of the following facts does the method of periodic abstinence is based?

- a) Ovulation occurs on about the 14th day of menstruation.
- b) Ovum remains alive for about 1-2 days.
- c) Sperms survive for about 3 days.
- d) All of these

30. Read the following statements.

- (i) Birth control pills are likely to cause cardiovascular problems.
- (ii) A woman who substitutes or takes the place of the real mother to nurse the embryo is called surrogate mother.
- (iii) Numerous children have been produced by in vitro fertilisation but with some abnormalities.
- (iv) Woman plays a key role in the continuity of the family and human species.
- (v) Foetal sex determination test should not be banned.

Which of the following pair consists of incorrect statements.

- a) (i) and (ii)
- b) (ii) and (iv)
- c) (iii) and (v)
- d) None of these

31. Which of the following statements is correct?

a)

Hepatitis B virus (HBV) can be transmitted through blood transfusion, sexual contact, saliva, tears, intravenous drug abuse, tatooing, ear and nose piercing, sharing of razors, etc.

b)

Hepatitis B virus vaccine is the second generation vaccine produced from transgenic yeast by recombinant DNA technology.

c)

Hepatitis B virus vaccine is the first commercially available human vaccine produced by genetic engineering.

d) All of these

32. Assertion: Diaphragms, cervical caps and vaults are barriers made of rubber.

Reason: Diaphragms, cervical caps and vaults are inserted into the male reproductive tract during coitus.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false

d) If both assertion and reason are false.

33. RCH stands for

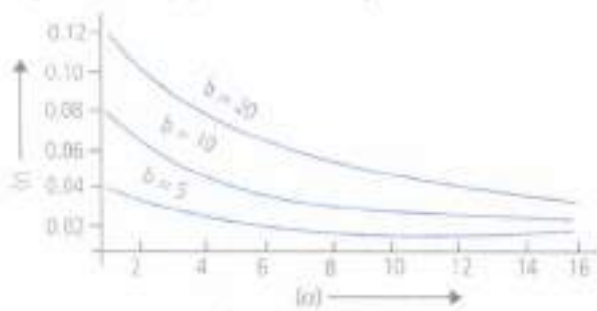
- a) Routine Check-up of Health
- b) Reproduction Cum Hygiene
- c) Reversible Contraceptive Hazards
- d) Reproductive and Child Health Care.

34. Which of the following is a hormone releasing IUD?

- a) LNG - 20
- b) Multiload - 375
- c) Lippes loop
- d) Cu-7

35. Assertion: As long as the mother breast-feeds the child fully, chances of conception are almost nil.
Reason: Lactational amenorrhea method is based on the fact that ovulation does not occur during the period of intense lactation.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
36. Given below is a list of few sexually transmitted infections. Identify the diseases caused by bacteria among these.
- (i) Gonorrhoea
(ii) Giardiasis
(iii) Trichomoniasis
(iv) Chancroid, (v) Syphilis
- a) (i) and (ii) b) (i), (iv) and (v) c) (iii) and (v) d) (ii), (iii) and (iv)
37. Tablets to prevent contraception contain _____
- a) progesterone b) FSH c) LH d) Both (b) and (c)
38. **Assertion:** Pills are very effective contraceptives with few side effects.
Reason: Pills inhibit ovulation and implantation as well as retard entry of sperms.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
39. Which one of the following groups includes sexually transmitted infections caused by bacteria only?
- a) Syphilis, gonorrhoea, chancroid b) Syphilis, chlamydia, chancroid
c) Syphilis, gonorrhoea, scabies d) Syphilis, scabies, pediculosis
40. The correct surgical procedure as a contraceptive method is
- a) ovariectomy b) hysterectomy c) vasectomy d) castration
41. Read the given statements and select the correct option.
- Statement 1:** Hepatitis B virus (HBV) is never transmitted through sexual contact with the infected person.
Statement 2: HBV vaccine is a third generation vaccine produced by recombinant DNA technology.
- a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

42. The graph below shows the relationships of per capita population growth rate (r), fecundity (b) and age at first reproduction (α) in an animal species.



What is the most important conclusion to be drawn from the graph?

- a)
The population growth rate decreases as first reproduction is postponed to a later stage, regardless of the fecundity.
- b) At any α , the higher the fecundity, the higher is the population growth rate achieved.
- c)
As the age at first reproduction is postponed further, the benefits of increasing fecundity on the population growth rate become progressively negligible.
- d) None of these
43. Choose the correct statement regarding the ZIFT procedure
- a)
Ovum collected from a female donor are transferred to the Fallopian tube to facilitate zygote formation.
- b) Zygote is collected from a female donor and transferred to the Fallopian tube.
- c) Zygote is collected from a female donor and transferred to the uterus.
- d) Ova collected from a female donor and transferred to the uterus.
44. Assisted reproductive technology, IVF involves transfer of _____ .
- a) ovum into the fallopian tube b) zygote into the fallopian tube c) zygote into the uterus
- d) embryo with 16 blastomeres into the fallopian tube
45. Match the following sexually transmitted diseases (Column-I) with their causative agent (Column-II) and select the correct option

Column I	Column II
(A) Gonorrhea	(i) HIV
(B) Syphilis	(ii) Neisseria
(C) Genital Warts	(iii) Treponema
(D) AIDS	(iv) Human

a)	b)	c)	d)
A B C D	A B C D	A B C D	A B C D
(ii)(iii)(iv)(i)	(iii)(iv)(i)(ii)	(iv)(ii)(iii)(i)	(iv)(iii)(ii)(i)

46. Which of the following is a non-medicated intrauterine device (IUD)?
- a) CuT b) Lippes Loop c) Cu7 d) LNG-20
47. **Assertion:** Syphilis, gonorrhoea and AIDS are STIs.
Reason: Syphilis, gonorrhoea and AIDS are transmitted through sexual intercourse.

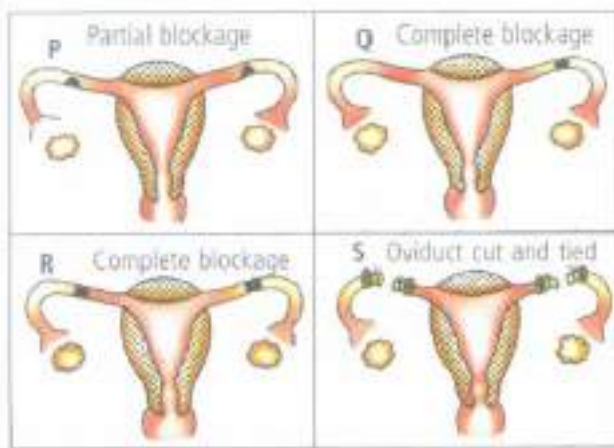
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
48. Which of the following statements is/are correct?
a)
Amniocentesis and CVS (chorionic villi sampling) are the techniques of detection of foetal disorders during early pregnancy.
b) Reproductive health refers to healthy reproductive organs with normal functions.
c)
India was amongst the first countries in the world to initiate action plans and programmes at a national level to attain total reproductive health.
d) All of these
49. The common means of transmission of AIDS is
a) sexual intercourse b) blood transfusion c) placental transfer d) all of these.
50. Read the given statements and select the correct option.
Statement 1: The world population was around 2 billions in 1900 which has rocketed to about 6 billions by 2000.
Statement 2: Increase in longevity due to decline in death rate, maternal mortality rate and infant mortality rate has been some major causes of population explosion.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
51. **Assertion:** Periodic abstinence is a method in which couples avoid from coitus from day 17 to 27 of menstrual cycle.
Reason: Periodic abstinence is a very effective method and 100% sure of birth control.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
52. Which two of the following statements are incorrect regarding in vitro fertilisation?
(i) In this method, ova from the wife/donor female and sperms from the husband/donor male are induced to form zygote in the uterus.
(ii) If the embryo is having 2 blastomeres, it is transferred into the uterus.
(iii) If the embryo is with more than 8 blastomeres, it is transferred into the uterus.
(iv) The baby thus produced is called test tube baby.
a) (iii) and (iv) b) (i) and (ii) c) (ii) and (iii) d) (i) and (iv)
53. Artificial insemination means:

- a) Artificial introduction of sperms of a healthy donor into the vagina
 - b) Introduction of sperms of a healthy donor directly into the ovary
 - c) Transfer of sperms of a healthy donor to a test tube containing ova
 - d) Transfer of sperms of husband to a test tube containing ova.
54. Read the given statements and select the correct option.
- Statement 1:** MTP is considered relatively safe during the first trimester of pregnancy.
- Statement 2:** Foetus becomes intimately associated with the maternal tissues after the first trimester.
- a) Both statements 1 and 2 are correct
 - b) Statement 1 is correct but statement 2 is incorrect.
 - c) Statement 1 is incorrect but statement 2 is correct.
 - d) Both statements 1 and 2 are incorrect.
55. The permissible use of the technique amniocentesis is for ____
- a) detecting sex of the unborn foetus b) artificial insemination
 - c) transfer of embryo into the uterus of the surrogate mother
 - d) detecting any genetic abnormality
56. Read the following statements and select the option having both incorrect statements.
- (i) Condoms decrease sperm motility.
 - (ii) Diaphragms, cervical caps and vaults are for both males and females.
 - (iii) IUDs are inserted by expert nurses.
 - (iv) Sterilisation is a terminal method to prevent further pregnancy.
- a) (i) and (iii) b) (i) and (ii) c) (iii) and (iv) d) (ii) and (iv)
57. Progesterone pill helps in preventing pregnancy by not allowing
- a) ova formation b) fertilisation c) implantation d) none of these
58. Read the given statements and select the correct option.
- Statement 1:** Transfer of an ovum collected from a donor into the Fallopian tube of another female who cannot produce an ovum, is called as GIFT.
- Statement 2:** Transfer of early embryos with up to 8 blastomeres into the Fallopian tube of the female, is called ZIFT.
- a) Both statements 1 and 2 are correct.
 - b) Statement 1 is correct but statement 2 is incorrect.
 - c) Statement 1 is incorrect but statement 2 is correct
 - d) Both statements 1 and 2 are incorrect
59. In India, human population is heavily weighed towards the younger age groups as a result of ____
- a) short life span of many individuals and low birth rate
 - b) long life span of many individuals and low birth rate
 - c) short life span of many individuals and high birth rate
 - d) long life span of many individuals and high birth rate
60. **Assertion:** Second trimester abortions are much more complicated.
- Reason:** After 12 weeks the foetus becomes intimately associated with the maternal tissues.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
 b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
61. Certain characteristic demographic features of developing countries are
 a) high fertility, high density, rapidly rising mortality rate and a very young age distribution
 b)
 high infant mortality rate, low fertility, uneven population growth and a very young age distribution
 c) high mortality, high density, uneven population growth and a very old age distribution
 d)
 high fertility, low or rapidly falling mortality rate, rapid population growth and a very young age distribution.
62. Condoms are one of the most popular contraceptives because of the following reasons.
 a) These are effective barriers for insemination. b) They do not interfere with coital act.
 c) These help in reducing the risk of STDs. d) All of the above
63. Colostrum the yellowish fluid, secreted by mother during the initial days of lactation is very essential to impart immunity to the new born infants because it contains _____
 a) monocytes b) macrophages c) immunoglobulin A d) natural killer cells
64. Fill up the blanks in the following paragraph by selecting the correct option.
 A. (i) methods work on the principle of avoiding chances of ovum and sperms meeting.
 B. (ii) is one such method in which the couples avoid coitus from day 10 to 17 of the menstrual cycle.
 C. (iii) is another method in which the male partner withdraws his penis from the vagina just before ejaculation so as to avoid insemination.
 D. (iv) method is based on the fact that ovulation and therefore the cycle do not occur during the period of intense lactation following parturition.
- a)
- | | | | |
|---------|--------------------|---------------------|------------------------|
| (i) | (ii) | (iii) | (iv) |
| Barrier | Coitus interruptus | Periodic abstinence | Lactational amenorrhea |
- b)
- | | | | |
|------|------------------------|--------------------|---------------------|
| (i) | (ii) | (iii) | (iv) |
| IUDs | Lactational amenorrhea | Coitus interruptus | Periodic abstinence |
- c)
- | | | | |
|---------|---------------------|--------------------|------------------------|
| (i) | (ii) | (iii) | (iv) |
| Natural | Periodic abstinence | Coitus interruptus | Lactational amenorrhea |
- d)
- | | | | |
|----------|---------------------|--------------------|------------------------|
| (i) | (ii) | (iii) | (iv) |
| Surgical | Periodic abstinence | Coitus interruptus | Lactational amenorrhea |
65. Which of the following statements is correct regarding vasectomy?
 a) It prevents the production of sperms in the testes. b) It prevents the production of semen
 c) It prevents the movement of sperms into the urethra,

d) It prevents a man from having an erection.

66. The accompanying diagram shows the uterine tubes of four women (P, Q, R and S).



In which two women is fertilisation impossible at present?

a) P and Q b) Q and R c) R and S d) S and P

67. Cu ions released from copper - releasing Intra Uterine Devices (IUDs) _____

a) make uterus unsuitable for implantation b) increase phagocytosis of sperms
c) suppress sperm motility d) prevent ovulation

68. The birth control device used by women is

a) diaphragm b) vault c) copper T d) all of these

69. A sexually transmitted disease symptomised by the development of chancre on the genitals is caused by the infection of

a) Treponema pallidum b) Neisseria gonorrhoeae c) human immunodeficiency virus
d) hepatitis B virus

70. Consider the statements given below regarding contraception and answer as directed there after

(i) Medical Termination of Pregnancy (MTP) during first trimester is generally safe.
(ii) Generally chances of conception are nil until mother breast-feeds the infant upto two years.
(iii) Intrauterine devices like copper-T are effective contraceptives.
(iv) Contraception pills may be taken upto one week after coitus to prevent conception.

Which two of the above statements are correct?

a) (ii) and (iii) b) (iii) and (iv) c) (i) and (iii) d) (i) and (ii)

71. Which of the following is not an intrauterine device?

a) Progestasert b) Multiload-375 c) Norplant d) Lippes loop

72. Consider the following statements each with one or two blanks.

(A) Lippes loop is a (i) IUD while multiload 375 is a (ii) IUD.

(B) Surgical methods of contraception are also called as (iii) methods.

(C) High MMR and IMR play a significant role in (iv) human population.

Which one of the following options, gives the correct fill ups for the respective blank numbers from (i) to (iv) in the above statements?

a) (i) copper releasing, (ii) non-medicated (iv) decreasing b) (iii) barrier, (iv) increasing

c) (i) non-medicated, (ii) copper releasing, (iv) decreasing

d) (i) copper releasing, (ii) non-medicated, (iii) sterilisation

73. What is true about "Saheli"?
- (i) Developed at the CDRI, Lucknow
 - (ii) Contains a steroidal preparation
 - (iii) "Once-a-week" pill
 - (iv) Many side effects
 - (v) High contraceptive value
 - (vi) Very few side effects
 - (vii) Low contraceptive value
- a) (i), (ii), (iii), (v), (vi) b) (i), (iii), (v), (vi) c) (i), (ii), (iii), (iv), (v) d) (i), (iii), (iv), (v)
74. Intensely lactating mothers do not generally conceive due to the:
- a) suppression of gonadotropins. b) hypersecretion of gonadotropins.
c) suppression of gametic transport. d) suppression of fertilisation.
75. Family planning programme was initiated in
- a) 1920 b) 1930 c) 1950 d) 1951
76. Which of the following approaches does not give the defined action of contraceptive?
- a)
Intra uterine devices - Increase phagocytosis of sperms suppress sperm motility and fertilizing capacity of sperms
- b)
Hormonal contraceptives - prevent/retard entry of sperms, prevent ovulation and fertilization
- c) Vasectomy - Prevents spermatogenesis d) Barrier Methods - Prevent fertilization
77. Diaphragms are contraceptive devices used by the females. Choose the correct option from the statements given below.
- (i) They are introduced into the uterus.
 - (ii) They are placed to cover the cervical region.
 - (iii) They act as physical barriers for sperm entry.
 - (iv) They act as spermicidal agents.
- a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (iii) and (iv)
78. Select the correct statement regarding IUDs out of the following.
- a)
Intrauterine devices (IUDs) are objects which are inserted in the uterus of the female through vagina by expert doctors
- b)
IUDs may be categorised as non-medicated IUDs (e.g. lippes loop). copper releasing IUDs (e.g., CuT. Cu7, Multiload 375) and hormone releasing IUDs (e.g., progestasert, LNG-20).
- c)
In India, use of IUDs is one of the most widely accepted methods of contraception these days.
- d) All of these
79. Emergency contraceptives are effective if used within

- a) 72 hrs of coitus b) 72 hrs of ovulation c) 72 hrs of menstruation
d) 72 hrs of implantation.
80. **Assertion:** Infertility is the inability to produce children inspite of unprotected sexual co-habitation.
Reason: Infertile couples could have children using assisted reproductive technologies (ART).
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
81. Which of the following is a hormone releasing Intra Uterine Device (IUD)?
a) Multiload 375 b) LNG-20 c) Cervical cap d) Vault
82. Which of the following contraceptive methods do involve a role of hormone?
a) Barrier method, Lactational amenorrhea, Pills. b) CuT, Pills, Emergency contraceptives.
c) Pills, Emergency contraceptives, Barrier methods.
d) Lactational amenorrhea, Pills Emergency contraceptives.
83. Consider the following statements and select the option stating which ones are true (T) and which ones are false (F).
(i) Abortions could happen spontaneously too.
(ii) Infertility is the inability to produce viable offspring due to defects in the female partner only.
(iii) Complete lactation could help in contraception.
(iv) Creating awareness can help create a reproductively healthy society.
- a) b) c) d)
- | | | | |
|-----|------|-------|------|
| (i) | (ii) | (iii) | (iv) |
| F | F | T | T |
- | | | | |
|-----|------|-------|------|
| (i) | (ii) | (iii) | (iv) |
| F | T | F | T |
- | | | | |
|-----|------|-------|------|
| (i) | (ii) | (iii) | (iv) |
| T | F | T | T |
- | | | | |
|-----|------|-------|------|
| (i) | (ii) | (iii) | (iv) |
| T | T | F | F |
84. Which of the following statements are correct regarding surgical methods of contraception?
(i) These are generally advised to the male/female partner as a terminal method to prevent any more pregnancies,
(ii) Surgical procedure in male is called tubectomy and that in the female, vasectomy,
(iii) Reversibility is easily possible,
(iv) They block gamete transport and thereby prevent conception,
a) (ii) and (iii) b) (i), (ii) and (iii) c) (i) and (iv) d) (ii) and (iv)
85. Which one of the following is the most widely accepted method of contraception in India, as at present?
a) IUDs (Intra uterine devices) b) Cervical caps c) Tubectomy d) Diaphragms.
86. Which of the following is correct regarding HIV, hepatitis B, gonorrhoea, trichomoniasis?
a) Trichomoniasis is an STD whereas others are not.
b) Gonorrhoea is a viral disease whereas others are bacterial.
c) HIV is a pathogen whereas others are diseases
d) Hepatitis B is eradicated completely whereas others are not.

87. Read the given statements and select the correct option.

Statement 1: Diaphragms, cervical caps and vaults are made of rubber and are inserted into the female reproductive tract to cover the cervix before coitus.

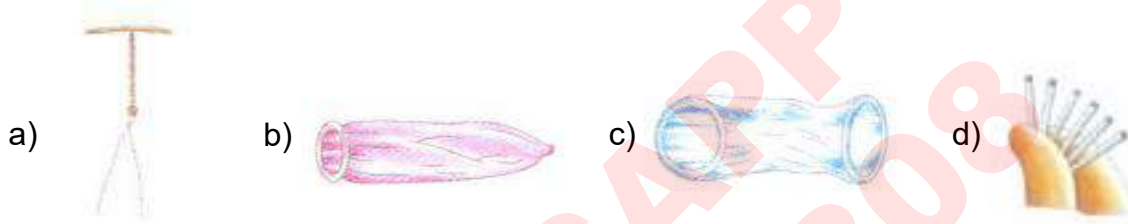
Statement 2: These are chemical barriers of conception which are reusable.

- a) Both statements 1 and 2 are correct
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct
- d) Both statements 1 and 2 are incorrect

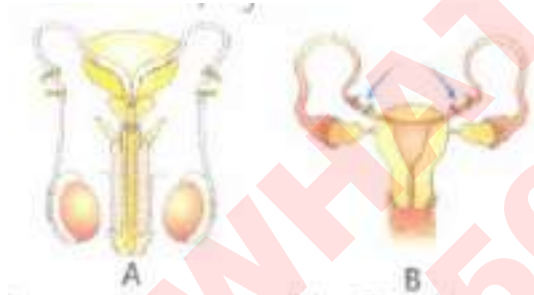
88. From the sexually transmitted diseases mentioned below, identify the one which does not specifically affect the sex organs.

- a) Syphilis b) AIDS c) Gonorrhea d) Genital warts

89. Which of the following contraceptives are implanted under the skin?



90. Which of the following figures shows tubectomy?



- a) A only b) B only c) Either A or B d) None of these

91. **Assertion:** Saheli, the new oral contraceptive for the females contains a steroidal preparation.

Reason: 'Saheli' is taken daily without a break.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
- b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.

92. Human population growth in India_____

- a) tends to follow a sigmoid curve as in case of many other animal species
- b) tends to reach zero population growth as in case of some animal species
- c) can be reduced by permitting natural calamities and enforcing birth control measures
- d) can be regulated by following the National programme of family planning

93. Which of the following are the drawbacks of the IUDs?

- (i) Their spontaneous expulsion, even without the woman's knowledge.
- (ii) They can cause excess menstrual bleeding and pain.
- (iii) Risk of perforation of uterus.

(iv) Risk of infection.

(v) They increase the phagocytosis of sperms.

(vi) They suppress sperm motility.

a) (i), (iii) and (vi) b) (i), (ii), (iv) and (vi) c) (i), (ii), (iii) and (v) d) (i), (ii), (iii) and (iv)

94. **Assertion:** IUT is transfer of embryo with more than 8 blastomeres into the Fallopian tubes.

Reason: IUT is a very popular method of forming embryos in vivo.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

95. Which of the following is ART?

a) IUDs b) GIFT c) ZIFT d) Both (b) and (c)

96. Which of the following contraceptive methods correctly matches with its mode of action?

a)

Contraceptive method	Mode of action
Tubectomy	Makes the uterus unsuitable for implantation

b)

Contraceptive method	Mode of action
Oral pills	Inhibit ovulation and implantation

c)

Contraceptive method	Mode of action
Diaphragms	Spermicidal and increases phagocytosis of sperms within the uterus

d)

Contraceptive method	Mode of action
IUDs	Blocks gamete transport

97. Increased IMR and decreased MMR in a population will

a) cause rapid increase in growth rate b) result in decline in growth rate

c) not cause significant change in growth rate d) result in an explosive population.

98. The function of copper ions in copper releasing IUD's is_____

a) They suppress sperm motility and fertilising capacity of sperms

b) They inhibit gametogenesis c) They make uterus unsuitable for implantation

d) They inhibit ovulation

99. Artificial insemination mean _____ .

a) Transfer of sperms of husband to a test tube containing ova.

b) Artificial introduction of sperms of a healthy donor into the vagina.

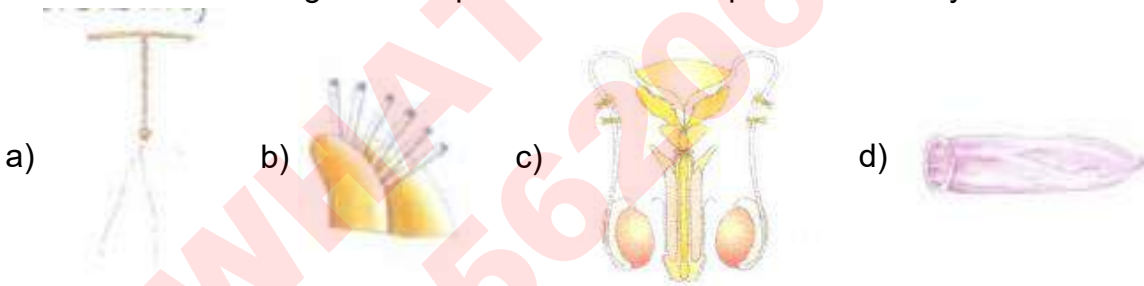
c) Introduction of sperms of a healthy donor directly into the ovary.

d) Transfer of sperms of a healthy donor to a test tube containing ova.

100. **Assertion:** IVF is fertilisation outside the body of woman.

Reason: The zygote upto 8 blastomeres could be transferred into the Fallopian tube.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
101. Which of these can be used to cure infertility in couples where male partner has very low sperm count?
a) IUD b) GIFT c) IUI d) None of these
102. Which of the following are the reasons for population explosion?
(i) Increased health facilities
(ii) Rapid increase in MMR
(iii) Rapid increase in IMR
(iv) Rapid decrease in MMR
(v) Decrease in number of people reaching reproductive age
a) (i) and (iv) b) (iii) and (v) c) (ii) and (iii) d) (i) and (v)
103. The contraceptive 'SAHELI' _____
a) is an IUD b) increases the concentration of estrogen and prevents ovulation in females
c) blocks estrogen receptors in the uterus, preventing eggs from getting implanted
d) is a post-coital contraceptive
104. Which of the following contraceptive methods has poor reversibility?



105. Which of the following correctly describes the measures that can be used to control over-population?
a) Educating people about the advantages of a small family b) Raising the age of marriage
c) Encouraging family planning programme d) All of these
106. Which of the following is a full proof method of contraception?
a) Implantation b) Lactational amenorrhea c) Condoms d) Sterilisation
107. World AIDS day is
a) December 21 b) December 1 c) November 1 d) June 11.
108. The technique called Gamete intra fallopian transfer [GIFT] is recommended for those females:
a) Who cannot produce an ovum b) Who cannot retain the foetus inside uterus
c) Whose cervical canal is too narrow to allow passage for the sperms
d) Who cannot provide suitable environment for fertilization
109. Match column I with column II and select the correct option from the given codes.

Column I	Column II
----------	-----------

A. Natural methods	(i) Coitus interruptus
B. IUDs	(ii) LNG - 20
C. Barrier methods	(iii) Diaphragms
D. Surgical methods	(iv) Multiload 375
E. Oral contraceptives	(v) Saheli
	(vi) Nirodh
	(vii) Sterilisation
	(viii) Vasectomy
	(ix) CuT

- a) A-(i), B-(ii); (iv); (ix), C-(iii); (vi), D-(vii); (viii), E-(v)
b) A-(i), B-(ii); (iv), C-(iii); (vi); (ix), D-(vii); (viii), E-(v)
c) A-(i), B-(ii); (iv); C-(iii); (ix), D-(vii); (viii), E-(v); (vi)
d) A-(i), B-(iv); (ix), C-(ii); (iii); (vi), D-(vii); (viii), E-(v)
110. Assisted reproductive technologies (ART)
a)
include social awareness programmes to educate people about reproductive health and diseases
b)
include research organisation working to produce new and more effective contraceptives for birth control
c) include a number of special techniques which assist infertile couples to have children
d) both (b) and (c).
111. Which of the following is not a sexually transmitted disease?
a) Syphilis b) Acquired Immunodeficiency Syndrome (AIDS) c) Trichomoniasis
d) Encephalitis
112. Given below are three statements (A-C) each with one or two blanks. Select the option which correctly fills up the blanks in any two statements.
A. Diseases or infections which are transmitted through sexual intercourse are collectively called (i) diseases.
B. Genital herpes is (ii) disease.
C. Sterilisation in males is (iii) while in females is (iv).
a) A-(i) venereal; B-(ii) incurable b) A-(i) venereal; B-(ii) curable
c) A-(i) non-communicable; C-(iii) tubectomy, (iv) vasectomy
d) B-(ii) bacterial; C-(iii) tubectomy, (iv) vasectomy
113. Sterilisation techniques are generally fool proof methods of contraception with least side effects. Yet, this is the last option for the couples because
(i) it is almost irreversible
(ii) of the misconception that it will reduce sexual urge/drive
(iii) it is a surgical procedure
(iv) of lack of sufficient facilities in many parts of the country.
Choose the correct option.

- a) (i) and (iii) b) (ii) and (iii) c) (ii) and (iv) d) (i), (ii), (iii) and (iv)

114. Select the correct statement regarding subcutaneous implantation of synthetic progesterone.

- a) It is a contraception technique.
b) It acts by blocking ovulation and prevents sperm transport.

c)

Six match-stick sized capsules containing the progestogen steroid are inserted under the skin of the inner arm above the elbow.

- d) All of these

115. Read the given statements and select the correct option.

Statement 1: Use of condom is a safeguard against AIDS and sexual diseases besides checking pregnancy.

Statement 2: Certain contraceptives are implanted under the skin of the upper arm to prevent pregnancy.

- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.

116. Embryo with more than 16 blastomeres formed due to in vitro fertilisation is transferred into:

- a) Uterus b) Fallopian tube c) Fimbriae d) Cervix

117. Which of the following statements is correct with reference to a test tube baby?

a)

Fertilisation of the egg is completed outside the body; the fertilised egg is then placed in the womb of the mother where the gestation is completed.

b)

Fertilisation of the egg is completed in the female genital tract. It is then taken out and grown in a large test tube.

c) A prematurely born baby is reared in an incubator.

d) Fertilisation of the egg and growth of the embryo is completed in a large test tube.

118. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Syphilis	(i) Human papilloma virus
B. Chancroid	(ii) Haemophilus ducreyi
C. AIDS	(iii) Treponema pallidum
D. Genital warts	(iv) HIV

a)

A	B	C	D
(iii)	(ii)	(iv)	(i)

b)

A	B	C	D
(ii)	(i)	(iii)	(iv)

c)

A	B	C	D
(iv)	(ii)	(i)	(iii)

d)

A	B	C	D
(i)	(iv)	(iii)	(ii)

119. Which of the following birth control measures can be considered as the safest?

- a) The rhythm method b) The use of physical barriers c) contraceptive pills
d) Sterilisation techniques

120. What is the work of copper-T?
a) To inhibit ovulation b) To inhibit fertilisation c) To inhibit implantation of blastocyst
d) To inhibit gametogenesis
121. Carrying capacity is
a) both (a) and (b) b) none of these.
c) maximum number of individuals which an environment can sustain
d) minimum number of individuals which an environment can sustain
122. Confirmatory test for STIs is
a) ELISA b) PCR c) DNA hybridisation d) all of these
123. The test - tube baby programme employs which of the following technique?
a) Intra cytoplasmic sperm injection [ICSI] b) Gamete intra fallopian transfer [GIFr]
c) Intra uterine insemination [IUI] d) Zygote intra fallopian transfer [ZIFT]
124. Consider the following statements and select the option stating which ones are true (T) and which ones are false (F).
(i) There are many side effects of tubectomy and vasectomy.
(ii) Purpose of tubectomy is to prevent egg formation.
(iii) Contraceptive oral pills help in birth control by preventing ovulation.
(iv) Genital warts is a sexually transmitted disease caused by herpes virus.
(v) In India, there is rapid decline in infant mortality rate and MMR.
- a)

(i)	(ii)	(iii)	(iv)	(v)
T	F	T	F	F
- b)

(i)	(ii)	(iii)	(iv)	(v)
F	F	F	T	T
- c)

(i)	(ii)	(iii)	(iv)	(v)
T	T	T	F	F
- d)

(i)	(ii)	(iii)	(iv)	(v)
F	F	T	F	T
125. Reproductive health in society can be improved by
(i) Introduction of sex education in schools
(ii) Increased medical assistance
(iii) Awareness about contraception and STDs
(iv) Equal opportunities to male and female child
(v) Encouraging myths and misconceptions
a) (i), (ii), (iii), (iv), (v) b) (i), (ii), (iv), (v) c) (i), (ii), (iii), (iv) d) (ii), (v)
126. In which of the following techniques, the embryos are transferred to assist those females who cannot conceive?
a) ICSI and ZIFT b) GIFT and ICSI c) ZIFT and IUT d) GIFT and ZIFT
127. **Assertion:** Introduction of sex education in schools should be encouraged.
Reason: Sex education in schools will encourage children to believe in myths about sex related aspects
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.
128. Tubectomy is a method of sterilization in which_____

- a) small part of the fallopian tube is removed or tied up b) ovaries are removed surgically
c) small part of vas deferens is removed or tied up d) uterus is removed surgically.

129. What is the figure given below showing in particular?



- a) Ovarian cancer b) Uterine cancer c) Tubectomy d) Vasectomy
130. Amniocentesis is a technique used to
a) determine errors in amino acid metabolism in embryo
b) pin point specific cardiac ailments in embryo
c) determine any hereditary genetic abnormality in embryo d) all of these.
131. A childless couple can be assisted to have a child through a technique called GIFT. The full form of this technique is _____.
a) gamete intra fallopian transfer b) gamete internal fertilisation and transfer
c) germ cell internal fallopian transfer d) gemete inseminated fallopian transfer
132. Read the given statements and select the correct option.
Statement 1: CuT, Cu7 and multiload 375 are the hormone releasing IUDs.
Statement 2: Cu ions released by some IUDs affect the ability of uterine wall to support embryo thus cause contraception.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
133. How do the pills work?
(i) Inhibit ovulation and implantation
(ii) Alter the quality of cervical mucus to prevent or retard the entry of sperms
(iii) Inhibit spermatogenesis
a) (i), (ii) and (iii) b) (i) and (ii) c) (ii) only d) (iii) only
134. Which of the following pairs contributes to an increase in population?
a) Natality and immigration b) Mortality and emigration c) Natality and emigration
d) Mortality and immigration
135. Which of the following statements are correct?
(i) India's first test tube baby's name is Kum Harsha.
(ii) Inability to conceive or produce children even after 2 years of unprotected sexual cohabitation is called infertility.
(iii) Surgical method of contraception prevents gamete formation.
(iv) MTPs are relatively safe up to 12 weeks of pregnancy.
a) (iii) and (iv) b) (i) and (iii) c) (i), (ii) and (iv) d) (ii), (iii) and (iv)

136. Medical termination of pregnancy [MTP] is considered safe up to how many weeks of pregnancy?
a) Eight weeks b) Twelve weeks c) Eighteen weeks d) Six weeks
137. Following statements are given regarding MTP. Choose the correct options given below.
(i) MTPs are generally advised during first trimester.
(ii) MTPs are used as a contraceptive method.
(iii) MTPs are always surgical.
(iv) MTPs require the assistance of qualified medical personnel.
a) (ii) and (iii) b) (i) and (iii) c) (i) and (iv) d) (i) and (ii)
138. Main disadvantage of intrauterine contraceptive devices is that
a)
the devices are permanently placed in uterus and cannot be removed even if couple want to have children
b) the device has to be inserted by physician in the uterus through vagina
c) the devices are expelled out without the knowledge of the wearers d) both (a) and (c).
139. What is true for U "lactational amenorrhea"?
(i) It means absence of menstruation.
(ii) Ovulation does not occur during the lactational period.
(iii) Chances of contraception are almost nil up to six months following parturition.
(iv) Side effects are almost nil.
(v) Contraceptive efficiency reduces after the period of intense lactation.
(vi) It is a natural method of contraception.
(vii) It increases phagocytosis of sperms.
a) (ii), (iii), (iv), (v) and (vi) b) (i), (ii), (iii) and (iv) c) (ii), (iii), (iv), (v) and (vii)
d) (i), (ii), (iii), (iv), (v) and (vi)
140. Select the hormone-releasing Intra-Uterine Devices ____
a) Multiload 375, Progestasert b) Progestasert, LNG-20 c) Lippes Loop, Multiload 375
d) Vaults, LNG-20
141. The first case of IVF-ET technique success, was reported by
a) Louis Joy Brown and Banting Best b) Patrick Steptoe and Robert Edwards
c) Robert Steptoe and Gilbert Brown d) Baylis and Starling Taylor
142. In which of the following weeks of pregnancy CVS is done?
a) 12th - 14th week b) 8th - 10th week c) 5th - 7th week d) None of these
143. Which of the following statements is incorrect regarding the medical termination of pregnancy (MTP)?
a) These help in getting rid of unwanted pregnancies.
b)
These help in aborting the pregnancies which may be harmful to either mother or foetus or both.
c) These contribute in decreasing the human population. d) None of these
144. Test-tube baby is one who _____

- a) is born out of artificial insemination b) has undergone development in a test-tube
c) is born out of the technique of fertilisation in vitro
d) has been developed without fertilisation
145. Choose the right one among the statements given below.
a) IUDs are generally inserted by the user herself.
b) IUDs increase phagocytosis reaction in the uterus. c) IUDs suppress gametogenesis.
d) IUDs once inserted need not be replaced.
146. Multiload device contains
a) manganese b) iron c) copper d) calcium
147. One of the legal methods of birth control is _____
a) by abstaining from coitus from day 10 to 17 of the menstrual cycle.
b) by having coitus at the time of day break c) by a premature ejaculation during coitus.
d) abortion by taking an appropriate medicine
148. Which of the following is the most widely accepted method of contraception in India at present?
a) Cervical caps b) Tubectomy c) Diaphragms d) IUDs (Intra uterine devices)
149. The most important component of oral contraceptive pills is
a) progesterone-estrogen b) growth hormone c) thyroxine d) luteinising hormone.
150. A national level approach to build up a reproductively healthy society was taken up in our country in
a) 1950s b) 1960s c) 1980s d) 1990s.
151. Hepatitis B is transmitted through
a) blood transfusion b) intimate physical contact c) sexual contact d) all of these.
152. Which of the following is incorrect regarding vasectomy?
a) No sperm occurs in seminal fluid b) No sperm occurs in epididymis
c) Vasadeferentia is cut and tied d) Irreversible sterility
153. In case of a couple where the male is having a very low sperm count, which technique will be suitable for fertilisation?
a) Intra uterine transfer b) Gamete intracytoplasmic fallopian transfer
c) Artificial Insemination d) Intracytoplasmic sperm injection
154. Read the given statements and select the correct option.
Statement 1: 'Sahel!' is an oral pill which has high contraceptive value and very little side effects.
Statement 2: 'Sahel!' contains progestin with no estrogen, and a non-steroidal preparation called centchroman.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

155. To avoid transmission of STIs we should
- (i) Avoid sex with multiple partners
 - (ii) Always have unprotected sex
 - (iii) Use condoms during coitus
 - (iv) Avoid sex with unknown partners
 - (v) Avoid sharing of needles
- a) (i), (ii), (iii), (iv) and (v) b) (i), (iii), (iv) and (v) c) (i), (ii) and (iii) d) (i), (ii) and (iv)
156. Amniocentesis is a process to _____
- a) determine any disease in heart b) determine any hereditary disease in the embryo
c) know about the disease of brain d) All of the above
157. Which method can be used for women that cannot produce ovum but can provide suitable environment?
- a) IUD b) GIFT c) IUI d) ICSI
158. Read the given statements and select the correct option.
- Statement 1:** Amniocentesis is often misused.
- Statement 2:** Amniocentesis is being used to determine the sex of the foetus so that female foetus may be aborted.
- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.
159. Read the following statements and select the correct option.
- Statement 1: Subcutaneous implantation of synthetic progesterone prevents pregnancy for about 5 years.
- Statement 2: A tiny amount of progesterone is steadily released from the inserts into the blood.
- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 but 2 are incorrect.
160. The best way to decrease population of a country is
- a) to educate people b) to have better houses c) to kill people on a large scale
d) to practice and implement family planning.
161. Identify the figures of the contraceptives given below and select the correct option.



a)

A	B	C	D
Condom for female	Implant	CuT	Condom for male

b)

A	B	C	D
Implant	CuT	Condom for female	Condom for male

c)

A	B	C	D
Condom for male	CuT	Implant	Condom for female

d)

A	B	C	D
Condom for male	Implant	CuT	Condom for female

162. Which of the following cannot be detected in a developing foetus by amniocentesis?

- a) Sex of the foetus b) Down syndrome c) Jaundice d) Klinefelter syndrome

163. Which of the following is wrongly matched?

a)

IUI - Semen collected from husband or donor is artificially introduced either into the vagina or into the uterus

b) GIFT - Transfer of embryos with more than 8 blastomeres into the Fallopian tube

c) ICSI - Sperm directly injected into the ovum

d) ZIFT - Transfer of embryos upto 8 blastomeres into the Fallopian tube









RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins









PRINCIPLES OF INHERITANCE AND VARIATION 1

Marks : 1493

1. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offsprings?
a) A, B and AB only b) A, B, AB and O c) O only d) A and B Only
2. Fruit colour in squash is an example of _____.
a) Recessive epistasis b) Dominant epistasis c) Complementary genes
d) Inhibitory genes
3. Under which of the following conditions will there be no change in the reading frame of following mRNA?
5'AACAGCGGUGCUAUU3"
a) Deletion of G from 5th position
b) Insertion of A and G at 4th and 5th positions respectively
c) Deletion of GGU from 7th, 8th and 9th positions d) Insertion of G at 5th position
4. Which one is the incorrect match?
a)  —  - Consanguineous mating b)  - Sex unspecified c)  - Male
d)   - Affected individuals
5. If a colour blind man marries woman who is homozygous for normal colour vision, the probability of their son being colour blind is.
a) 1 b) 0 c) 0.5 d) 0.75
6. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the F₁ plants were selfed, the resulting genotype were in the ratio of :
a) 1:2:1:: Tall heterozygous: Tall homozygous: Dwarf b) 3:1:: Tall:Dwarf
c) 3:1:: Dwarf: Tall d) 1:2:1: Tall homozygous: Tall heterozygous: Dwarf
7. What is the genetic disorder in which an individual has an overall masculine development gynaecomastia, and is sterile?
a) Klinefelter's syndrome b) Edward syndrome c) Down's syndrome
d) Turner's syndrome
8. Select the correct statement:
a) Spliceosomes take part in translation
b) Punnett square was developed by a British scientist.

- c) Franklin Stahl coined the term "linkage".
 d) Transduction was discovered by S. Altman.
9. Father of a child is colourblind and mother is carrier for colourblindness, the probability of the child being colour blind is:
 a) 25% b) 50% c) 100% d) 75%
10. Match column I with column II and select the correct option from the given codes.
- | Column I | Column II |
|-------------------------|-----------------------------------|
| A. Sickle cell anaemia | (i) 7 th chromosome |
| B. Phenylketonuria | (ii) 4 th chromosome |
| C. Cystic fibrosis | (iii) 11 th chromosome |
| D. Huntington's disease | (iv) X-chromosome |
| E. Colourblindness | (v) 12 th chromosome |
- a) A-(iii), B-(v), C-(ii), D-(i), E-(iv) b) A-(iii), B-(v), C-(i), D-(ii), E-(iv)
 c) A-(v), B-(iv), C-(ii), D-(iii), E-(i) d) A-(iv), B-(ii), C-(iii), D-(i), E-(v)
11. Which one of the following traits of garden pea studied by Mendel was a recessive feature?
 a) Round seed shape b) Axial flower position c) Green seed colour
 d) Green pod colour
12. Which of the following will not result in variations among siblings?
 a) Independent assortment of genes b) Crossing over c) Linkage d) Mutation
13. A colourblind mother and normal father would have _____
 a) colour blind sons and normal/carrier daughters b) colour blind sons and daughters
 c) all colour blind d) all normal
14. Two non-allelic genes produce new phenotype when present together but fail to do so independently are called?
 a) Epistasis b) Polygene c) Non-complimentary genes d) Complimentary genes
15. Which of the following is correct match?
 a) Down's syndrome - 21 st chromosome b) Sickle cell anaemia - X-chromosome
 c) Haemophilia Y-chromosome d) Parkinson disease - X & Y chromosome
16. Some of the dominant traits studied by Mendel were
 a) round seed shape, green seed colour and axial flower position
 b) terminal flower position, green pod colour and inflated pod shape
 c) violet flower colour, green pod colour, round seed shape
 d) wrinkled seed shape, yellow pod colour, and axial flower position
17. What are the chances of this couple's fifth child being an albino?
 a) 1 in 1 b) 1 in 2 c) 1 in 3 d) 1 in 4
18. Christmas disease is another name for _____
 a) sleeping sickness b) haemophilia c) hepatitis B d) Down's syndrome

19. Mendel's last law is _____
 a) segregation b) dominance c) independent assortment d) polygenic inheritance
20. Which one of the following cannot be explained on the basis of Mendel's Law of Dominance?
 a) Factors occur in pairs.
 b) The discrete unit controlling a particular character is called a factor
 c) Out of one pair of factors one is dominant, and the other recessive
 d) Alleles do not show any blending and both the characters recover as such in F_2 generation
21. In a dihybrid cross, if you get 9: 3: 3: 1 ratio it denotes that
 a) the alleles of two genes are interacting with each other
 b) it is a multigenic inheritance c) it is a case of multiple allelism
 d) the alleles of two genes are segregating independently.
22. Which base is responsible for hotspots for spontaneous point mutations?
 a) Guanine b) Adenine c) 5-bromouracil d) 5-methylcytosine
23. Law of independent assortment can be explained with the help of
 a) dihybrid cross b) test cross c) back cross d) monohybrid cross.
24. When dominant and recessive alleles express itself together it is called _____
 a) codominance b) dominance c) amphidominance d) pseudodominance
25. Refer to the given table of contrasting traits in pea plants studied by Mendel

Character	Dominant trait	Recessive trait
(i) Seed colour	 Yellow	 Green
(ii) Flower colour	 Violet	 White
(iii) Pod shape	 Full	 Constricted
(iv) Flower position	 Axial	 Terminal

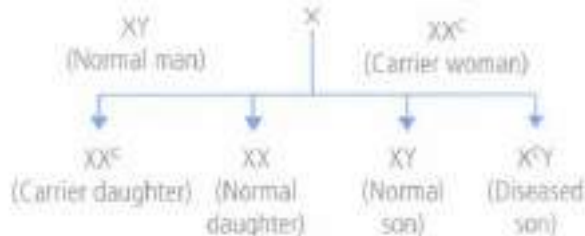
Which of the given traits is correctly placed?

- a) (i), (ii) and (iii) only b) (ii), (iii) and (iv) only c) (ii) and (iii) only
d) (i), (ii), (iii) and (iv)

26. Experimental verification of the chromosomal theory of inheritance was done by _____.

- a) Boveri b) Morgan c) Mendel d) Sutton

27. Inheritance of which of the following traits is shown in the given cross?



- a) X-linked dominant trait b) X-linked recessive trait c) Autosomal recessive trait
d) Autosomal dominant trait

28. A child of blood group O cannot have parents of blood groups _____.

- a) AB and AB/O b) A and B c) B and B d) O and O

29. **Assertion:** The maximum frequency of recombination, that can result from crossing over between linked genes, is 50 percent.

Reason: Linked genes shown higher frequency of crossing over if distance between them is longer.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

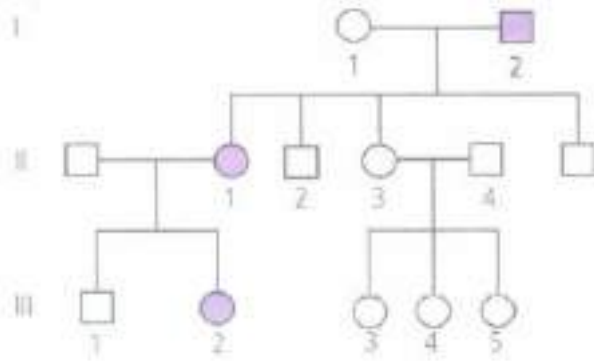
30. Which three scientists independently rediscovered Mendel's work?

- a) Avery, McLeod, McCarty b) Sutton, Morgan and Bridges
c) Bateson, Punnett and Bridges d) de Vries, Correns and Tschermak

31. Distance between the genes and percentage of recombination shows

- a) a direct relationship b) an inverse relationship c) a parallel relationship
d) no relationship

32. Fused ear lobes appear in the progeny due to an autosomal recessive gene. Work out the genotypes of members in the given pedigree.



a)	b)	c)	d)
I-2 II-3 III-1	I-2 II-3 III-1	I-2 II-3 III-1	I-2 II-3 III-1
aa Aa Aa	aa AA AA	Aa Aa Aa	aa Aa AA

33. The salivary gland chromosomes in the dipteran larvae, are useful in gene mapping because _____.

- a) these are fused b) these are much longer in size c) these are easy to stain
d) They have endoreduplicated chromosomes

34. Find the correct match:

Column I	Column II
a Phenotype	i Mendel
b Father of genetics	ii Johanssen
c Heterozygous	iii Correns
d Incomplete dominance	iv Bateson

- a) a(ii), b(i), c(iv), d(iii) b) a(ii), b(i), c(iii), d(iv) c) a(iv), b(i), c(iii), d(ii)
d) a(i), b(ii), c(iii), d(iv)

35. If linkage was known at the time of Mendel then which of the following laws, he would not have been able to explain?

- a) Law of dominance b) Law of independent assortment c) Law of segregation
d) Law of purity of gametes

36. XO type of sex determination and XY type of sex determination are the examples of

- a) male heterogamety b) female heterogamety c) male homogamety
d) both (b) and (c).

37. Which of the following is mismatched pair of disease and its related symptom?

a)

Disease	Symptom
Phenylketonuria	Urine turns black on exposure to air

b)

Disease	Symptom
Down's syndrome	Physical and mental retardation

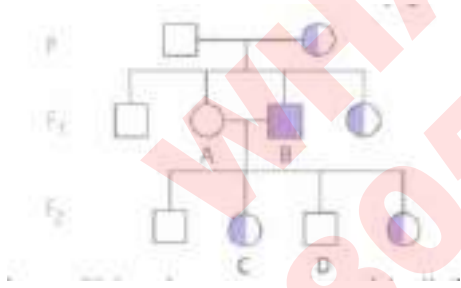
c)

Disease	Symptom
Klinefelter's syndrome	Sterile males

d)

Disease	Symptom
Turner's syndrome	Sterile females

38. Which of the following is autosomal dominant disease?
a) Albinism b) Cystic fibrosis c) PKU d) Myotonic dystrophy
39. The allele which is unable to express its effect in the presence of another is called _____
a) codominant b) supplementary c) complementary d) recessive
40. A gene locus has two alleles A, a. If the frequency of dominant allele A is 0.4, then what will be the frequency of homozygous dominant, heterozygous and homozygous recessive individuals in the population?
a) 0.16(AA); 0.24(Aa); 0.36(aa) b) 0.16(AA); 0.48(Aa); 0.36(aa)
c) 0.16(AA); 0.36(Aa); 0.48(aa) d) 0.36(AA); 0.48(Aa); 0.16(aa)
41. Haploids are able to express both recessive and dominant alleles/mutations because there are _____
a) many alleles for each gene b) two alleles for each gene
c) only one allele for each gene in the individual d) only one allele in a gene
42. First geneticist/father of genetics was _____.
a) Devries b) Mendel c) Darwin d) Morgan
43. Study the given pedigree chart showing the inheritance of an X-linked trait controlled by gene 'r'.



- What will be the genotypes of individuals A, B, C and D respectively?
a) XX, X^rY, X^rX, XY b) X^rX^r, XY, XX, XY c) X^rX, X^rY^r, X^rX^r, X^rY d) XX, X^rY^r, XX, XY
44. Crossing over in diploid organism is responsible for _____.
a) dominance of genes b) linkage between genes c) segregation of alleles
d) recombination of linked alleles
45. The linkage map of X-chromosome of fruit fly has 66 units, with yellow body gene (y) at one end and bobbed hair (b) gene at the other end. The recombination frequency between these two genes (y and b) should be _____.
a) 100% b) 6% c) >50% d) <50%
46. Both sickle cell anemia and Huntington's chorea are _____.
a) congenital disorders b) pollutant-induced disorders c) virus-related diseases
d) bacteria - related diseases

47. Which of the following are reasons for Mendel's success?
- (i) Usage of pure lines or pure breeding varieties
 - (ii) Consideration of one character at a time
 - (iii) Maintenance of statistical records of experiments
 - (iv) Knowledge of linkage and incomplete dominance
- a) (i) and (ii) only b) (i), (ii) and (iii) c) (i) and (iv) only d) (ii), (iii) and (iv)
48. Mendel studied inheritance of seven pairs of traits in pea which can have 21 possible combinations. If you are told that in one of these combinations, independent assortment is not observed in later studies, your reaction will be _____
- a) independent assortment principle may be wrong
b) Mendel might not have studied all the combinations c) it is impossible
d) later studies may be wrong
49. Which one of the following postulates was converted by Correns into first law of Mendel?
- a) Postulate 1 b) Postulate 2 c) Postulate 3 d) Postulate 4
50. Mother and father of a person with 'O' blood group have 'A' and 'B' blood group respectively. What would be the genotype of both mother and father?
- a) Mother is homozygous for 'A' blood group and father is heterozygous for 'B'.
b) Mother is heterozygous for 'A' blood group and father is homozygous for 'B'.
c) Both mother and father are heterozygous for 'A' and 'B' blood group, respectively.
d) Both mother and father are homozygous for 'A' and 'B' blood group, respectively.
51. When mulatto male individual marries with very light (albino) female, the percentage of very light offsprings will be
- a) 25% b) 60% c) 12.5% d) 50%
52. An individual exhibiting both male and female sexual characteristics in the body is known as _____.
- a) hermaphrodite b) intersex c) gynandromorph d) bisexual
53. If Mendel had studied the seven traits using a plant with 12 chromosomes instead of 14, in what way would his interpretation have been different?
- a) He would have mapped the chromosome
b) He would have discovered blending or incomplete dominance
c) He would not have discovered the law of independent assortment
d) He would have discovered sex-linkage
54. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Turner's syndrome	(i) Trisomy
B. Linkage	(ii) AA+XO
C. Y-chromosome	(iii) Morgan
D. Down's syndrome	(iv) TDF

- a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(iv), B-(ii), C-(i), D-(iii)
d) A-(ii), B-(iii), C-(iv), D-(i)

55. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism. The phenomenon is called as:
a) polyploidy b) aneuploidy c) haploidy d) diploidy
56. Point mutation may occur due to
a) alteration in DNA sequence b) change in a single base pair of DNA
c) deletion of a segment of DNA d) gain of a segment in DNA.
57. Which one of the following blood groups is not possible in children from parents with combination B x AB?
a) A b) B c) AB d) O
58. Blue eye colour is recessive to brown eye colour. A brown eyed man whose mother was blue eyed marries a blue eyed women. The children shall be_____.
a) both blue eyed and brown eyed 1: 1 b) all brown eyed c) all blue eyed
d) blue eyed and brown eyed 3: 1
59. Which condition describes the sex correctly?
a) XO condition as in Turner's syndrome determines the female sex
b) XX sex chromosomes produce male in *Drosophila*
c) ZZ sex chromosomes determine female sex in birds
d) XO sex chromosomes determine male sex in Grasshopper
60. True-breeding red-eyed **Drosophila** flies with plain thoraxes were crossed with pink-eyed flies with striped thoraxes.
Red eye plain thorax \times Pink eye striped thorax
The F_1 flies were then test crossed against the double recessive.
The following F_2 generation resulted from the cross:
- | | | | |
|--------------|----------------|--------------|----------------|
| 80 | 16 | 12 | 92 |
| Red eye | Red eye | Pink eye | Pink eye |
| Plain thorax | Striped thorax | Plain thorax | Striped thorax |
- What percentage number of recombinants resulted from the test cross?
a) 12 b) 14 c) 16 d) 28
61. Sickle cell anaemia has not been eliminated from the African population because_____
a) it is not a fatal disease b) it provides immunity against malaria
c) it is controlled by dominant genes d) it is controlled by recessive genes
62. In Down's syndrome of a male child, the sex complement is_____
a) XO b) XY c) XX d) XXY
63. Outcross represents
a) AA x BB b) Aa x aa c) aa x AA d) Aa x AA
64. A cross between pure tall pea plant with green pods and dwarf pea plant with yellow pods will produce dwarf F_2 , plants out of 16_____
a) 9 b) 3 c) 4 d) 1
65. Possible blood group in children from the parents with 'B' and 'O' blood group are

- a) All B b) All O c) Both B and O d) A and B
66. Select the incorrect statement from the following _____ .
- a) Galactosemia is an inborn error of metabolism.
 - b) Small population size results in random genetic drift in a population
 - c) Baldness is a sex -limited trait
 - d) Linkage is an exception to the principle of independent assortment in heredity
67. In polygenic inheritance
- a) many genes govern a single character
 - b) heterozygous organisms express only one allele itself
 - c) heterozygous organisms express both alleles
 - d) a single gene influences many characters
68. Two crosses between the same pair of genotypes or phenotypes in which the source of the gametes are reversed in one cross, is known as _____
- a) reverse cross b) test cross c) reciprocal cross d) dihybrid cross
69. A marriage between a colourblind man and a normal woman produces
- a) all carrier daughters and normal sons
 - b) 50% carrier daughters, 50% normal daughters
 - c) 50% colourblind sons, 50% normal sons d) all carrier offsprings.
70. The gene disorder phenylketonuria is an example for
- a) multiple allelism b) polygenic inheritance c) multiple factor d) pleiotropy
71. Which of the following is not an example of recessive autosomal disease?
- a) Haemophilia b) Cystic fibrosis c) Phenylketonuria d) Sickle-cell anaemia
72. Which of the following is suitable for experiment on linkage?
- a) aaBB x aaBB b) AAbb x aabb c) AaBb x AaBb d) AAbb x AaBB
73. A gene showing codominance has _____
- a) alleles tightly linked on the same chromosome
 - b) alleles that are recessive to each other
 - c) both alleles independently expressed in the heterozygote
 - d) one allele dominant on the other
74. The hereditary material present in the bacterium E. coli is _____
- a) single stranded RNA b) double stranded RNA c) single stranded DNA
 - d) double stranded DNA
75. A normal green male maize is crossed with albino female. The progeny is albino because _____
- a) green plastids of male must have mutated b) trait for albinism is dominant
 - c) the albinos have biochemical to destroy plastids derived from green male
 - d) plastids are inherited from female parent
76. The formation of multivalents at meiosis in diploid organism is due to _____
- a) monosomy b) inversion c) deletion d) reciprocal translocation

77. Of both normal parents, the chance of a male child becoming colour blind are _____ .
a) no b) possible only when all the four grand parents had normal vision
c) possible only when father's mother was colour blind
d) possible only when mother's father was colour blind
78. Genotypically and phenotypically same ratio is obtained from
a) Incomplete dominance b) Multiple alleles c) Out cross d) Reciprocal cross
79. In human beings 45 chromosomes/single X/XO abnormality causes _____.
a) Down's syndrome b) Klinefelter's syndrome c) Turner's syndrome
d) Edward's syndrome
80. **Assertion:** Turner's syndrome is caused due to absence of anyone of the X and Y sex chromosome.
Reason: Such individuals show masculine as well as feminine development
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
81. Which of the following characters was not chosen by Mendel?
a) Pod shape b) Pod colour c) Location of flower d) Location of pod
82. Both husband and wife have normal vision though their fathers were colour blind. The probability of their daughter becoming colour- blind is _____.
a) 0% b) 25% c) 50% d) 75%
83. How many phenotypes are produced in a test cross of AaBBCC?
a) Two b) Four c) Eight d) Twelve
84. Alleles are_____
a) true breeding homozygotes b) different molecular forms of a gene
c) heterozygotes d) different phenotype
85. Mendel's experimental plant was *Pisum sativum*, but also worked and failed to find result on
a) Tobacco and sweet pea b) *Hieracium* and *Dolichos* c) *Hieracium* and *Oenothera*
d) *Dolichos* and *Oenothera*
86. In mice, black coat colour (allele B) is dominant to brown coat colour (allele b). The offspring of a cross between a black mouse (BB) and a brown mouse (bb) were allowed to interbreed. What percentage of the progeny would have black coats?
a) 25% b) 50% c) 75% d) 100%

87. The allele for pea comb (P) in chickens is completely dominant to the allele for single comb (p). The alleles for black feather colour (B), and white feather colour (B') show codominance, so that BB' individuals possess blue feathers. If chickens heterozygous for both pairs of genes are mated, what proportion of offspring are expected to be pea combed and white feathered?
a) 9/16 b) 3/16 c) 1/16 d) 2/16
88. An individual affected by phenylketonuria lacks an enzyme that converts the amino acid _____ into _____.
a) tyrosine, phenylalanine b) phenylalanine, tyrosine
c) homogentisic acid, phenylalanine d) homogentisic acid, tyrosine
89. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by _____.
a) only grand children b) only sons c) only daughters d) Both (b) and (c)
90. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Autosomal recessive trait	(i) Down's syndrome or mongolism
B. Sex-linked recessive trait	(ii) Phenylketonuria
C. Metabolic error linked to autosomal recessive trait	(iii) Haemophilia
D. Additional 21 st chromosome anaemia	(iv) Sickle cell

- a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(iv), B-(iii), C-(ii), D-(i)
d) A-(iii), B-(iv), C-(i), D-(ii)
91. If both parents are carriers for thalassaemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?
a) 25% b) 100% c) No chance d) 50%
92. Of a normal couple, half the sons are haemophilic while half the daughters are carriers. The gene is located on _____.
a) X-chromosome of father b) Y-chromosome of father
c) one X-chromosome of mother d) both the X-chromosomes of mother
93. All of the following are parts of an operon except _____.
a) an enhancer b) structural genes c) an operator d) a promoter
94. When a cross is made between a tall plant with yellow seeds (Tt Yy) and a tall plant with green seeds (Tt yy), what is true regarding the proportions of phenotypes of the offsprings in F₁ generation?

a)

Proportion of Tall and Green	Proportion of Dwarf and Green
$\frac{3}{8}$	$\frac{1}{8}$

b)

Proportion of Tall and Green	Proportion of Dwarf and Green
$\frac{2}{8}$	$\frac{1}{8}$

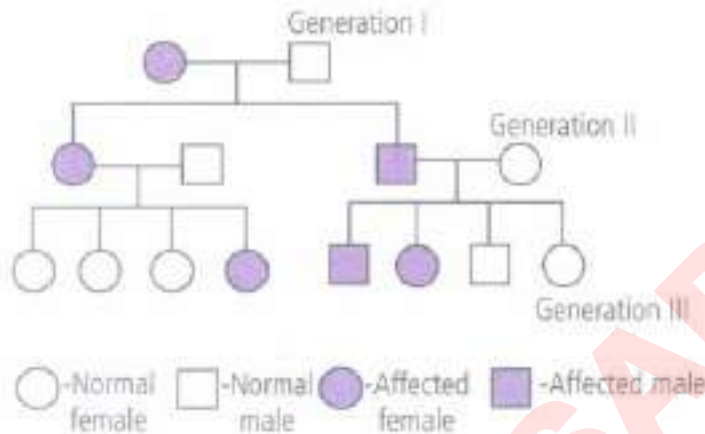
c)

Proportion of Tall and Green	Proportion of Dwarf and Green
$\frac{1}{8}$	$\frac{3}{8}$

d)

Proportion of Tall and Green	Proportion of Dwarf and Green
$\frac{2}{8}$	$\frac{2}{8}$

95. A pedigree is shown below for a disease that is autosomal dominant. What would be the genetic make up of the first generation?

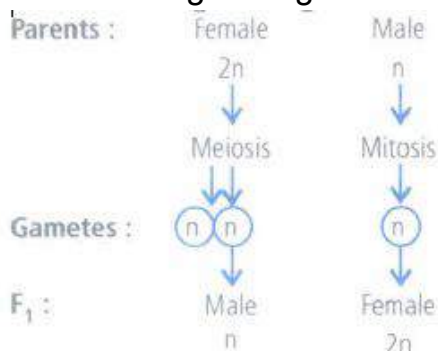


- a) AA, Aa b) Aa, aa c) Aa, AA d) Aa, Aa
96. The genes controlling the seven pea characters studied by Mendel are now known to be located on how many different chromosomes ?
a) Four b) Seven c) Six d) Five
97. Lack of independent assortment of two genes A and B in fruit fly *Drosophila* is due to ____
a) repulsion b) recombination c) linkage d) crossing over
98. Total 512 seeds are collected from the cross $WwYy \times WwYy$. Find the number of plants produced with first dominant and second recessive trait.
a) 288 b) 96 c) 32 d) 320
99. To determine the genotype of a tall plant of F_2 generation, Mendel crossed this plant with a dwarf plant. This cross represents a
a) test cross b) back cross c) reciprocal cross d) dihybrid cross
100. ABO blood groups in human beings are controlled by the gene I . The gene I has three alleles - I^A , I^B and i . Since there are three different alleles, six different genotypes are possible. How many phenotypes can occur?
a) Six b) Two c) Three d) Four
101. The distance between the genes is measured by
a) Dobson unit b) millimetre c) angstrom d) map unit
102. Who observed that the behaviour of chromosomes at meiosis can serve as the cellular basis of both segregation and independent assortment?
a) Sutton and Boveri b) Banden and Boveri c) W.Flemming d) Boveri and Brauer

103. Select the correct match:
a) T.H. Morgan-Transduction b) F2 x Recessive parent-Dihybrid cross
c) Ribozyme-Nucleic acid d) G. Mendel-Transformation
104. Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder?
a) 25% b) 100% c) 75% d) 50%
105. Mendel formulated the law of purity of gametes on the basis of
a) monohybrid cross b) dihybrid cross c) test cross d) back cross
106. Different mutations referable to the same locus of chromosome give rise to _____.
a) pseudoalleles b) polygenes c) oncogenes d) multiple alleles
107. The colour based contrasting traits in seven contrasting pairs, studied by Mendel in pea plant were
a) 1 b) 2 c) 3 d) 4
108. Heterozygous tall and red flowered pea plants were selfed and total 2000 seeds were collected. What is the total number of seeds heterozygous for both the traits?
a) 250 b) 500 c) 1250 d) 750
109. When a single gene influences more than one trait it is called
a) pseudodominance b) pleiotropy c) epistasis d) none of these
110. Pick out the correct statements
(i) Haemophilia is a sex linked recessive disease.
(ii) Down's syndrome is due to aneuploidy
(iii) Phenylketonuria is an autosomal recessive gene disorder
(iv) Sickle cell anaemia is an X-linked recessive gene disorder
a) (ii) and (iv) correct b) (i), (iii) and (iv) correct c) (i), (ii) and (iii) correct
d) (ii) and (iv) correct
111. Pleiotropic genes have
a) repressed phenotype b) hidden phenotype c) multiple phenotype d) all of these
112. Which one from those given below is the period for Mendel's hybridisation experiments?
a) 1856-1863 b) 1840-1850 c) 1857-1869 d) 1870-1877
113. A woman with albinic father marries an albinic man. The proportion of her progeny is _____.
a) 2 normal: 1 albinic b) all normal c) all albinic d) 1 normal: 1 albinic
114. Alleles that produce independent effects in their heterozygous condition are called _____.
a) codominant alleles b) epistatic alleles c) complementary alleles
d) supplementary alleles
115. Which one is a hereditary disease _____.
a) Cataract b) Leprosy c) Blindness d) phenyl ketonuria

116. The genotype of a plant showing the dominant phenotype can be determined by _____
a) test cross b) dihybrid cross c) pedigree analysis d) back cross
117. Rate of mutation is affected by
a) temperature b) X-rays c) gamma rays d) all of these
118. The cross over frequencies between the genes A and B, A and C and B and C is 6%, 15% and 21% respectively. What is the sequence of genes on chromosome?
a) A, B, C b) B, A, C c) A, C, B d) Either B, A, C or C, A, B
119. A colourblind man (X^cY) marries a woman who is carrier for haemophilia (XX^h). Which of the following is true for their progenies?
a) 25% female progenies carry the genes for both haemophilia and colourblindness
b) 25% male progenies carry only the gene for haemophilia.
c) 25% female progenies carry only the gene for colourblindness. d) All of these
120. A man with a certain disease marries a normal woman. They have eight children (3 daughters and 5 sons). All the daughters suffer from their father's disease but none of the sons are affected. Which of the following mode of inheritance do you suggest for this disease?
a) Sex-linked recessive b) Sex-linked dominant c) Autosomal dominant
d) Sex-limited recessive
121. Which one of the following Mendelian traits is present on 5th chromosome?
a) Pod shape b) Pod colour c) Flowers colour d) Pod position
122. The disease sickle-cell anaemia is caused by the substitution of (i) by (ii) at the (iii) position of (iv) globin chain of haemoglobin molecule. Which of the following correctly fills the blanks in the above statement?
a) (i) valine, (ii) glutamic acid, (iii) sixth, (iv) beta
b) (i) glutamic acid, (ii) valine, (iii) sixth, (iv) beta
c) (i) glutamic acid, (ii) valine, (iii) fifth, (iv) beta
d) (i) valine, (ii) glutamic acid, (iii) fifth, (iv) beta

123. Refer to the given figure.



This type of sex determination is found in

- a) grasshoppers and cockroaches b) birds and reptiles c) butterflies and moths
d) honeybees, ants and wasps.

124. **Assertion:** Pairing and separation of pair of chromosomes would lead to segregation of a pair of factors they carried.
Reason: Two alleles of a gene pair are located on similar sites on non-homologous chromosomes.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false
125. Both the alleles are independently expressed in
a) Eye colour in Drosophila b) Fruit colour in Cucurbita c) Sickle cell haemoglobin
d) Height in tobacco
126. In sickle cell anaemia glutamic acid is replaced by valine Which one of the following triplets codes for valine?
a) G G G b) A A G c) G A A d) G U G
127. Select the correct statement from the ones given below with respect to dihybrid cross _____
a) Tightly linked genes on the same chromosome show higher recombinations.
b) Genes far apart on the same chromosome show very few recombinations.
c)
Genes loosely linked on the same chromosome show similar recombinations as the tightly linked ones
d) Tightly linked genes on the same chromosome show very few recombinations
128. Which one of the Mendel traits of pea was recessive
a) Axial flower b) Green pod c) Green seed colour d) Green seed colour
129. Haemophilic man marries a normal woman. Their offspring will be _____
a) all boys haemophilic b) all normal c) all girls haemophilic d) all haemophilic
130. **Assertion:** Test cross is the cross between the F_1 progeny and either of the parent types.
Reason: Back cross is the cross between F_1 progeny and the double recessive genotype.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false

131. The given Punnett's square represents the pattern of inheritance in a dihybrid cross where yellow (Y) and round (R) seed condition is dominant over white (y) and wrinkled (r) seed condition.

	YR	Yr	yR	yr
YR	F	J	N	R
Yr	G	K	O	S
yR	H	L	P	T
yr	I	M	Q	U

- A plant of type 'H' will produce seeds with the genotype identical to seeds produced by the plants of
- a) Type M b) Type J c) Type P d) Type N
132. The recessive genes located on X-chromosome in humans are always _____
a) lethal b) sub-lethal c) expressed in males d) expressed in females
133. An allele is dominant if it is expressed in _____
a) both homozygous and heterozygous states b) second generation
c) heterozygous combination d) homozygous combination
134. Which of the following is an example of pleiotropic effect?
a) Haemophilia b) Thalassemia c) Sickle cell anaemia d) Colour blindness
135. Which one of the following is a wrong statement regarding mutations?
a) Deletion and insertion of base pairs cause frame-shift mutations
b) Cancer cells commonly show chromosomal aberrations
c) UV and Gamma rays are mutagens
d) change in a single base pair of DNA does not cause mutation
136. Which one is correctly matched
a) Down's syndrome - 44 autosomes + XO
b) Klinefelter's syndrome - 44 autosomes + XXY c) Erythroblastosis foetalis - X linked
d) Colour blindness - Y linked
137. Refer the given statements and select the correct option.
(i) Percentage of homozygous dominant individuals obtained by selfing Aa individuals is 25%.
(ii) Types of genetically different gametes produced by genotype AABbcc are 2.
(iii) Phenotypic ratio of monohybrid F₂ progeny in case of **Mirabilis jalapa** is 3: 1.
a) All the statements are true.
b) Statements (i) and (ii) are true, but statement (iii) is false.
c) Statements (i) and (iii) are true, but statement (ii) is false.
d) Statements (ii) and (iii) are true, but statement (i) is false.
138. In the F₂ generation of a Mendelian dihybrid cross the number of phenotypes and genotypes are

- a) phenotypes-4; genotypes-16 b) phenotypes-9; genotypes-4
c) phenotypes-4; genotypes-8 d) phenotypes-4; genotypes-9.
139. Which condition of zygote cell will lead to birth of a normal human female child?
a) One X-chromosome b) One X and one Y chromosome c) Two X chromosome
d) One Y chromosome
140. On crossing two heterozygous tall plants (Tt) a total of 500 plants were obtained in F_1 generation. What will be the respective number of tall and dwarf plants obtained in F_1 generation?
a) 375, 125 b) 250, 250 c) 475, 25 d) 350, 150
141. Foetal sex can be determined by examining cells from the amniotic fluid by looking for _____
a) Barr bodies b) autosomes c) chiasmata d) kinetochore
142. Genes with multiple phenotypic effects are known as
a) hypostatic genes b) duplicate genes c) pleiotropic genes
d) complementary genes
143. Genes for cytoplasmic male sterility in plants are generally located in _____.
a) cytosol b) chloroplast genome c) mitochondrial genome d) nuclear genome
144. Which of the following trait is controlled by dominant autosomal genes?
a) Polydactyly b) Huntington's chorea c) PTC(phenylthiocarbamide) tasting
d) All of these
145. A cross between two tall plants resulted in offspring having few dwarf plants. What would be the genotypes of both the parents?
a) TT and Tt b) Tt and Tt c) TT and TT d) Tt and tt
146. _____pairs of contrasting traits were studied by Mendel in pea plant
a) 6 b) 7 c) 8 d) 10
147. Mental retardation in man, associated with sex chromosomal abnormality is usually due to _____
a) reduction in X-complement b) increase in X-complement
c) moderate increase in Y-complement d) large increase in Y-complement
148. Among the following characters, which one was not considered by Mendel in his experiments of pea?
a) Stem - Tall or Dwarf b) Trichomes - Glandular or non-glandular
c) Seed - Green or Yellow d) Pod - Inflated or constricted
149. Genotype of hybrid is determined by :
a) Crossing one F₁ progeny with recessive parent
b) Crossing one F₁ progeny with another F₁ progeny
c) Crossing one F₂ progeny with female parent
d) Crossing one F₂ progeny with male parent

150. A family of five daughters only is expecting sixth issue. The chance of its being a son is _____

- a) Zero b) 25% c) 50% d) 100%

151. A fruit fly heterozygous for sex-linked genes, is mated with normal female fruit fly. Male specific chromosome will enter egg cell in the proportion _____.

- a) 1: 1 b) 2: 1 c) 3: 1 d) 7: 1

152. An abnormal human baby with 'XXX' sex chromosomes was born due to _____

- a) formation of abnormal ova in the mother b) fusion of two ova and one sperm
c) fusion of two sperms and one ovum d) formation of abnormal sperms in the father

153. **Assertion:** Sickle-cell anaemia is an autosome-linked recessive disorder that can be transmitted if both parents are heterozygous for the gene.

Reason: In sickle-cell anaemia, haemoglobin molecule undergoes polymerisation under low oxygen tension causing the change in shape of RBC.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

154. Phenotypic and genotypic ratio is similar in case of

- a) complete dominance b) incomplete dominance c) over dominance d) epistasis

155. Sex is determined in human beings _____

- a) by ovum b) at the time of fertilisation c) 40 days after fertilisation
d) seventh to eight week when genitals differentiate in foetus

156. In Antirrhinum (dog flower), phenotypic ratio in F_2 generation for the inheritance of flower colour would be:

- a) 3: 1 b) 1: 2: 1 c) 1: 1 d) 2: 1

157. A human female with Turner's syndrome _____

- a) has 45 chromosomes with XO b) has one additional X chromosome
c) exhibits male characters d) is able to produce children with normal husband

158. What is the probability of production of dwarf offsprings in a cross between two heterozygous tall pea plants?

- a) Zero b) 50% c) 25% d) 100%

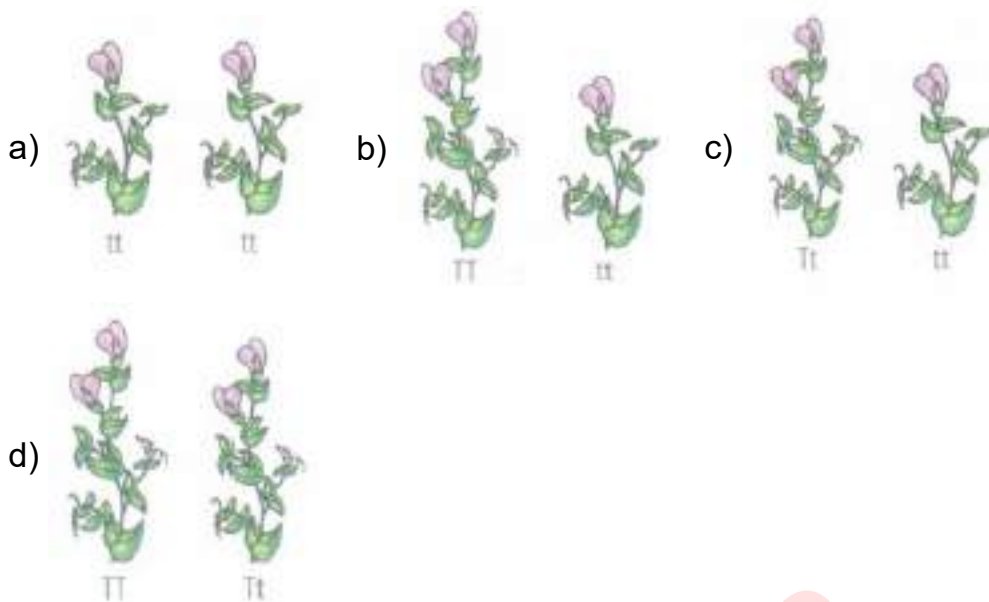
159. How many different kinds of gametes will be produced by a plant having the genotype AaBbCc?

- a) 4 b) 9 c) 2 d) 8

160. Law of independent assortment is derived from

- a) F_1 generation of trihybrid cross b) F_2 generation of dihybrid cross
c) F_2 generation of monohybrid d) One gene test cross

161. **Assertion:** Females, homozygous for genes on the X chromosomes do not express a trait more markedly than do hemizygous males.
Reason: Dosage compensation mechanism accounts for effective dosage genes in males and females.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false
162. In humans, attached earlobes are a dominant feature over free earlobes while hypertrichosis of the ear is a holandric (Y-linked) feature. A man with attached earlobes and extensive hair on pinna married a woman having free earlobes. The couple had one son with attached earlobes and hairy pinna, another son with free earlobes and hairy pinna and two daughters with attached earlobes. One of the daughters married a man with free earlobes and sparse hair on pinna. They had two sons. What would be the characteristics of their pinnae?
- a) Both will have attached earlobes and sparse hair on pinna.
- b)
There would be equal chances for both having free or attached earlobes and sparse hair on pinnae.
- c)
They would have hairy pinnae and there would be 1 in 8 chance that both will have attached earlobes.
- d) Both will have free earlobes and extensive hair on pinnae.
163. In order to find out the different types of gametes produced by a pea plant having the genotype AaBb, it should be crossed to a plant with the genotype_____
- a) AABB b) AaBb c) aabb d) aaBB
164. A woman with 47 chromosomes due to three copies of chromosome 21 is characterized by_____
- a) super femaleness b) triploidy c) Turner's Syndrome d) Down's Syndrome
165. Which of the following crosses will give tall and dwarf pea plants in same proportions?

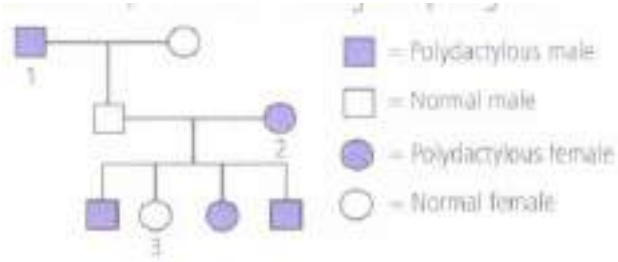


166. If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is:
 a) autosomal dominant b) autosomal recessive c) sex-linked dominant
 d) sex-linked recessive
167. A child has blood group 'O'. If father has blood group 'A' and mother has blood group 'B', work out the genotypes of the parents.
 a) $I^A I^A$ and $I^B i$ b) $I^A i$ and $I^B i$ c) $I^A i$ and ii d) ii and $I^B I^B$
168. In $TtGgRr \times TtGgRr$, the percentage of recessive individuals will be
 a) 12 b) 6 c) 25 d) 3
169. Due to nondisjunction of chromosomes during spermatogenesis, some sperms carry both sex chromosomes ($22A + XY$) and some sperms do not carry any sex chromosome ($22A + 0$). If these sperms fertilise normal eggs ($22A + X$), what types of genetic disorders respectively appear among the offsprings?
 a) Klinefelter's syndrome and Turner's syndrome
 b) Turner's syndrome and Klinefelter's syndrome
 c) Down's syndrome and Turner's syndrome
 d) Down's syndrome and cri-du-chat syndrome
170. Which is the most common mechanism of genetic variation in the population of sexually reproducing organism?
 a) Chromosomal aberrations b) Genetic drift c) Recombination d) Transduction
171. If character is controlled by six alleles of a gene, then the possible genotypes would be
 a) 21 b) 729 c) 64 d) 42
172. Types of gametes formed by the plant with genotype $AABbccDD$ will be
 a) 4 b) 16 c) 8 d) 2
173. Ratio of complementary genes _____ .
 a) 9: 3: 4 b) 12: 3: 1 c) 9: 3: 3: 4 d) 9: 7

174. A person with 47 chromosomes due to an additional Y chromosome suffers from a condition called_____.
a) Down's syndrome b) Super female c) Turner's syndrome
d) Klinefelter's syndrome
175. A pleiotropic gene_____
a) is a gene evolved during Pliocene
b) controls a trait only in combination with another gene
c) controls multiple traits in an individual d) is expressed only in primitive plants
176. Red green colourblindness is a sex linked trait. Which of the given statements is not correct regarding colourblindness?
a) It is more common in males than in females.
b)
Homozygous recessive condition is required for the expression of colourblindness in females.
c) Males can be carriers of the trait.
d)
Colourblind women always have colourblind father and always produce colourblind son.
177. In Mendelian dihybrid cross, when heterozygous Round Yellow are self crossed, Round Green offsprings are represented by the genotype
a) RrYy, RrYY, RRYy b) Rryy, RRyy, rryy c) rrYy, rrYY d) Rryy, RRyy.
178. In a certain plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant over shortness (t). If a plant with RRTt genotype is crossed with a plant rrtt genotype, what will be the percentage of tall plants with red fruits in the progeny?
a) 50% b) 100% c) 75% d) 25%
179. After crossing two plants, the progenies are found to be male sterile. This phenomenon is found to be maternally inherited and is due to some genes which are present in_____
a) nucleus b) chloroplast c) mitochondria d) cytoplasm
180. How many phenotypes are possible if a character is controlled by 5 pairs of polygenes?
a) 32 b) 11 c) 243 d) 81
181. Genes located on Y-chromosome are_____.
a) mutant genes b) sex-linked genes c) autosomal genes d) holandric genes
182. In monohybrid cross, number of pure line plants in F_2 will be
a) One b) Two c) Three d) Four
183. The characters which appear in the first filial generation are called
a) recessive characters b) dominant characters c) holandric characters
d) lethal characters
184. Two dominant non-allelic genes are 50 map units apart. The linkage is_____.
a) cis type b) trans type c) complete d) absent/incomplete

185. Two linked genes a and b show 20% recombination. The individuals of a dihybrid cross between $++/++ \times ab/ab$ shall show gametes _____ .
a) $++80: ab:20$ b) $++ 50: ab: 50$ c) $++40: ab 40: ++a 10: ++b: 10$
d) $++30: ab 30: ++a20: ++b: 20$
186. In a certain plant, yellow fruit colour (Y) is dominant to green fruit colour (y) and round shape (R) is dominant to oval shape (r). The two genes involved are located on different chromosomes.
Which of the following will result when plant YyRr is self-pollinated?
a) 9: 3: 3: 1 ratio of phenotypes only b) 9: 3: 3: 1 ratio of genotypes only
c) 1: 1: 1: 1 ratio of phenotypes only d) 1: 1: 1: 1 ratio of phenotypes and genotypes
187. The maximum height of a plant is 18 feet and minimum average height 6 feet. If plant height is controlled by 3 pairs of polygenes, then the height of a plant with genotype AabbCc will be
a) 8 feet b) 10 feet c) 12 feet d) 14 feet
188. HJ Muller was awarded Nobel Prize for his_____
a) discovery that chemicals can induce gene mutations
b) discovery that ionizing radiations can induce gene mutations
c) work on gene mapping in Drosophila
d) efforts to prevent the use of nuclear weapons
189. In maize, coloured endosperm (C) is dominant over colourless (c); and full endosperm (R) is dominant over shrunken (r). When a dihybrid of F_1 generation was test crossed, it produced four phenotypes in the following percentage:
Coloured full - 48%
Coloured shrunken - 5%
Colourless full - 7%
Colourless shrunken - 40%
From this data, what will be the distance between two non-allelic genes?
a) 48 units b) 5 units c) 7 units d) 12 units
190. The modified allele is generally the
a) Recessive allele b) Dominant allele c) Wild allele
d) More than one option is correct
191. Cri-du-chat syndrome in humans is caused by the _____.
a) loss of half of the short arm of chromosome
b) loss of half of the long arm of chromosome c) trisomy of 21 st chromosome.
d) fertilisation of an XX egg by a normal Y-bearing sperm.
192. The contrasting pairs of factors in Mendelian crosses are called_____
a) multiple alleles b) allelomorphs c) alloloci d) paramorphs
193. In humans, polydactyly (i.e, presence of extra fingers and toes) is determined by a dominant autosomal allele (P) and the normal condition is determined by a recessive allele (p). Find out the possible genotypes of family members 1, 2 and 3 in the

given pedigree.



a)	b)	c)	d)
1 2 3	1 2 3	1 2 3	1 2 3
PP Pp PP	PP PP pp	Pp PP Pp	Pp Pp pp

194. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Autopolyploidy	(i) $2n + 1$
B. Trisomy	(ii) AAAA
C. Allopolyploidy	(iii) AABB
D. Nullisomy	(iv) $2n - 2$

- a) A-(ii), B-(i), C-(iii), D-(iv) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(ii), B-(iv), C-(iii), D-(i)
 d) A-(ii), B-(i), C-(iv), D-(iii)

195. How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits?

- a) 14 b) 8 c) 4 d) 2

196. Read the given statements and select the correct option.

Statement 1: Test cross is used to determine an unknown genotype within one breeding generation.

Statement 2: Test cross is a cross between F_1 hybrid and dominant parent.

- a) Both statements 1 and 2 are correct.
 b) Statement 1 is correct but statement 2 is incorrect
 c) Statement 1 is incorrect but statement 2 is correct.
 d) Both statements 1 and 2 are incorrect.

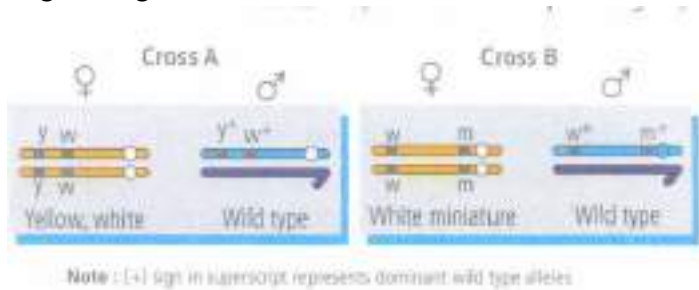
197. If a haemophilic man marries a carrier woman then which of the following holds true for their progenies?

- a) 50% daughters are carrier and 50% are haemophilic.
 b) All the daughters are haemophilic.
 c) All sons are haemophilic and all daughters are normal.
 d) All sons normal, all daughters carriers.

198. When two genetic loci produce identical phenotypes in cis and trans position, they are considered to be _____

- a) pseudoalleles b) different genes c) multiple alleles d) parts of same gene

199. Refer to the given figure of cross A and cross B and select the correct statement regarding them.



- a) In cross A, the strength of linkage between genes y and w is higher than the cross B genes w and m.
- b) In cross A, the strength of linkage between genes y and w is lesser than the cross B genes w and m.
- c) Both cross A genes y and w and cross B have the same strength of linkage.
- d) The percentage of recombinants produced in cross A is higher than cross B.

200. In a cross between negro and albino skin colour of humans showing polygenic inheritance, the phenotypic ratio in F_2 generation will be

a) 9:3:3:1 b) 1:6: 15:20: 15:6: 1 c) 1:4:6:4:1 d) 1:2:2:4: 1:2: 1:2:1

201. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Chromosomal aberration	(i) An additional sex chromosome
B. Down's syndrome	(ii) Inversion
C. Klinefelter's syndrome	(iii) Presence of an extra chromosome
D. Turner's syndrome	(iv) Absence of sex chromosome

- a) A-(ii), B-(iv), C-(i), D-(iii) b) A-(ii), B-(iv), C-(iii), D-(i) c) A-(ii), B-(iii), C-(i), D-(iv)
- d) A-(iii), B-(iv), C-(i), D-(ii)

202. Out of 8 ascospores formed in Neurospora the arrangement is 2a: 4a: 2a showing

- a) no crossing over b) some meiosis c) second generation division
- d) first generation division

203. Which one of the following crosses would have 1:1:1:1 ratio?

a) $TtRR \times ttrr$ b) $TTRR \times ttrr$ c) $TtRr \times ttrr$ d) $TtRR \times TTrr$

204. A man whose father was colour blind marries a woman who had a colour blind mother and normal father. What percentage of male children of this couple will be colour blind?

a) 25 % b) 0% c) 50% d) 75%

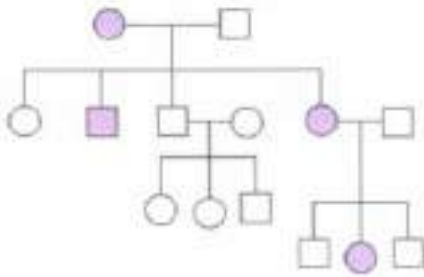
205. Which Mendelian idea is depicted by a cross in which the F_1 generation resembles both the parents?

- a) Law of dominance b) Inheritance of one gene c) Co-dominance
- d) Incomplete dominance

206. A colour blind man marries a woman with normal sight who has no history of colour blindness in her family. What is the probability of their grandson being colour blind?

- a) 0.25 b) 0.5 c) 1 d) Nil

207. Study the pedigree chart of a family showing the inheritance of myotonic dystrophy.



The trait under study is

- a) dominant X-linked b) recessive X-linked c) autosomal dominant
d) recessive Y-linked

208. **Assertion:** Turner's syndrome is caused due to absence of anyone of the X and Y sex chromosome.

Reason: Such individuals show masculine as well as feminine development

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

209. The genotypes of a husband and Wife are $I^A I^B$ and $I^A I^0$.

Among the blood types of their children, how many different genotypes and phenotypes are possible?

- a) 3 genotypes; 4 phenotypes b) 4 genotypes; 3 phenotypes
c) 4 genotypes; 4 phenotypes d) 3 genotypes; 3 phenotypes

210. A cow with red coat is crossed with a bull having white coat. Their offspring produced in F_1 generation showed roan coat. This effect is produced due to juxtaposition of small patches of red and white colour. What can be assumed about the gene controlling coat colour in cattle?

a)

The alleles of gene controlling coat colour show a perfect dominant recessive relationship.

b) The alleles of gene controlling coat colour are incompletely dominant.


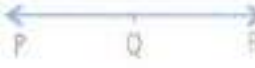


c) The alleles of gene controlling coat colour are codominant d) None of these

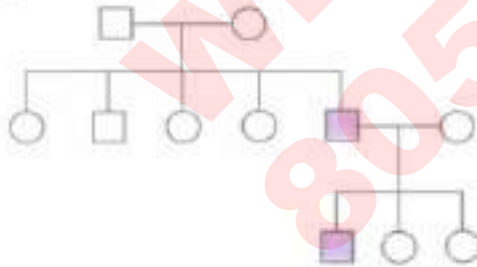
211. Loss of an X-chromosome in a particular cell, during its development, results into _____

- a) diploid individual b) triploid individual c) gynandromorphs d) Both (a) and (b)

212. _____ is an example of X-linked recessive trait.

- a) Phenylketonuria b) Haemophilia c) Cystic fibrosis d) Sickle-cell anaemia

213. Albinism is known to be due to an autosomal recessive mutation. The first child of a couple with normal skin pigmentation was an albino. What is the probability that then second child will also be an albino?
a) 100% b) 25% c) 50% d) 75%
214. Both chromosomes as well as genes do not occur in pairs in the
a) Somatic cells b) Fertilised egg c) Megaspore mother cell d) microspore
215. If map distance between genes P and Q is 4 units, between P and R is 11 units, and between Q and R is 7 units, the order of genes on the linkage map can be traced as follows.
- a)  b)  c) 
- d) 
216. Phenotype of an organism is the result of _____
a) cytoplasmic effects and nutrition b) environmental changes and sexual dimorphism
c) genotype and environment interactions d) mutations and linkages
217. A plant with genotype AABBCc is selfed F₂ phenotypic ratio would be :
a) 9: 3: 3: 1 b) 27: 9: 9: 9: 3: 3: 3 c) 1: 1 d) 3: 1
218. Down's syndrome is due to _____.
a) crossing over b) linkage c) sex-linked inheritance
d) non-disjunction of chromosomes
219. In the following pedigree chart, the mutant trait is shaded black. The gene responsible for the trait is



- a) dominant and sex linked b) dominant and autosomal c) recessive and sex linked
d) recessive and autosomal.
220. Given diagram shows a pair of homologous chromosomes during meiosis.

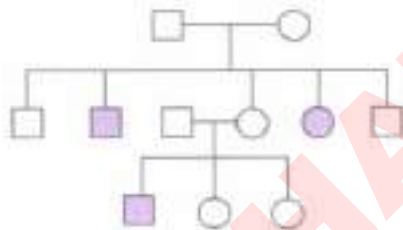


Maximum crossing over will occur between genes

- a) A and a, D and d b) C and d, c and D c) B and c, b and C d) A and d, a and D.

221. If two persons with AB' blood group marry and have sufficiently large number of children these children could be classified as A' blood group: AB' blood group: 'B' blood group in 1: 2: 1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in AB' blood group individuals. This is an example of _____ .
a) incomplete dominance b) Partial dominance c) Complete dominance
d) Codominance
222. The shorter and longer arms of a submetacentric chromosome are referred to as _____ .
a) p-arm and q-arm respectively b) q-arm and p-arm respectively
c) m-arm and n-arm respectively d) s-arm and l-arm respectively
223. Which of the following is the main category of mutation?
a) Somatic mutation b) Genetic mutation c) Zygotic mutation d) All of these
224. Inheritance of roan coat in cattle is an example of
a) incomplete dominance b) codominance c) multiple allelism d) none of these
225. The polytene chromosomes were discovered for the first time in _____
a) Drosophila b) Chironomus c) Musca nebulosa d) Musca domestica
226. In this disease, there occurs a failure of chloride ion transport mechanism in cell surface membrane of epithelial cells; sweat of the patient contains very high level of Na^+ and Cl^- ions. The disease is
a) thalassaemia b) Alzheimer's disease c) Gaucher's disease d) cystic fibrosis.
227. Match column I with column II and select the correct option from the given codes.
- | Column I | Column II |
|----------------------|---------------------------------------|
| A. Gregor J. Mendel | (i) Chromosomal theory of inheritance |
| B. Sutton and Boveri | (ii) Laws of inheritance |
| C. Henking | (iii) Drosophila |
| D. Morgan | (iv) Discovered X-body |
- a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(iv), B-(ii), C-(i), D-(iii)
d) A-(ii), B-(iii), C-(iv), D-(i)
228. Occasionally, a single gene may express more than one effect. The phenomenon is called
a) pleiotropy b) polygeny. c) multiple allelism d) mosaicism
229. The fruit colour in squash is an example of:
a) Recessive epistasis b) Dominant epistasis c) Complementary epistasis
d) Inhibitory genes
230. Mr. Kapoor has Bb autosomal gene pair and d allele sex linked. What shall be proportion of Bd in sperms?
a) 0 b) $\frac{1}{2}$ c) $\frac{1}{4}$ d) $\frac{1}{8}$
231. Conditions of a karyotype $2n \pm 1$ and $2n \pm 2$ are called
a) aneuploidy b) polyploidy c) allopolyploidy d) monosomy

232. G-6-P dehydrogenase deficiency is associated with haemolysis of _____.
a) leucocytes b) lymphocytes c) platelets d) RBCs
233. A colourblind girl is rare because she will be born only when _____.
a) her mother and maternal grandfather were colourblind
b) her father and maternal grandfather were colourblind
c) her mother is colour blind and father has normal vision
d) parents have normal vision but grand parents were colourblind
234. Insertion or deletion of a single base causes
a) inversion mutation b) transition mutation c) frame-shift mutation
d) transversion mutation
235. A normal women, whose father had haemophilia, married a normal man. What is the chance of occurrence of haemophilia in their children?
a) 25% b) 50% c) 75% d) Non haemophilic, 75% carrier
236. How many types of gametes can be produced by a diploid organism who is heterozygous for 4 loci?
a) 4 b) 8 c) 16 d) 32
237. Study the pedigree chart of a family showing the inheritance of sickle-cell anaemia.



- The trait traced in the above pedigree chart is
a) dominant X-linked b) recessive X-linked c) autosomal dominant
d) autosomal recessive
238. A diseased man marries a nonnal wonun. They have three daughters and five sons. All the daughters were diseased and sons were nomal. The gene of this disease is _____.
a) sex-linked dominant b) sex-linked recessive c) sex-linked character
d) autosomal dominant
239. A normal women, whose: father was colour-blind is married to a normal man. The sons would be _____.
a) 75% colour-blind b) 50% color-blind c) all normal d) all colour-blind
240. Haemophilia is more commonly seen in human males than, in human females because _____.
a) a greaterproportion ofgirls die in infancy
b) this disease is due to a Y-linked recessive mutation
c) this disease is due to an X-linhed recessive mutation
d) this disease is due to an X-linked dominant mutation

241. Andalusian fowls have two pure forms - black and white. If black forms (BB) and white forms (WW) are crossed, F_1 individuals appear blue coloured (BW), due to Incomplete dominance. Which of the following would be an outcome of a cross between black form and blue form?
a) 1 Black: 2 Blue: 1 White b) 2 Black: 1 Blue c) 1 Black: 2 Blue d) 1 Black: 1 Blue
242. Haemophilia is more common in males because it is a _____
a) recessive character carried by Y - chromosome
b) dominant character carried by Y -chromosome
c) dominant trait carried by X-chromosome
d) recessive trait carried by X-chromosome
243. *Nicotiana sylvestris* flowers only during long days and *N. tabacum* flowers only during short days. If raised in the laboratory under different photoperiods, they can be induced to flower at the same time and can be cross fertilised to produce self-fertile offspring. What is the best reason for considering *N. sylvestris* and *N. tabacum* to be separate species?
a) They are-morphologically-distinct b) They cannot interbreed in nature
c) They are reproductively distinct d) They are physiologically distinct
244. Select the disease which is caused by recessive autosomal genes when present in homozygous condition.
a) Alkaptonuria b) Albinism c) Cystic fibrosis d) All of these
245. When a certain character is inherited only through female,parents it probably represents _____
a) multiple plastid inheritance b) cytoplasmic inheritance c) incomplete dominance
d) Mendelian nuclear inheritance
246. An organism with two identical alleles is _____
a) dominant b) hybrid c) heterozygous d) homozygous
247. Assume that genes a and b linked and show 40% recombination. If $++/++$ individual is crossed with ab/ab , then types and proportions of gametes in F_1 will be
a) $++$ 20% : ab 20% : $+b$ 20% : $a+40\%$ b) $++$ 50% : ab 50%
c) $++25\%$: ab 25% : $+b$ 25% : a 25% d) $++$ 30% : ab 30% : $+b$ 20% : $a+20\%$
248. Out of A = T $G^{\circ}C$ pairing, bases of DNA may exist in alternate valency state owing to arrangement called _____
a) analogue substitution b) tautomerisational mutation c) frameshift mutation
d) point mutation
249. Complete the given table showing different possibilities of genotypes and their corresponding blood group, by selecting the correct option.

Genotypes	Blood groups
$I^A I^A$ (i) _____	A
$I^B I^B$ (ii) _____	B
_____ (iii) _____	AB
_____ (iv) _____	O

a)

i	ii	iii	iv
A A B B A B ii			

b)

i	ii	iii	iv
A A B B A B A i			

c)

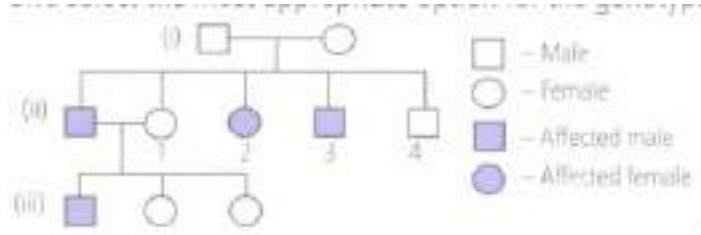
i	ii	iii	iv
A i B i A B ii			

d)

i	ii	iii	iv
A i B i A B B i			

250. Select the incorrect match _____ .
- a) Submetacentric-L - shaped chromosomes chromosomes
 b) Allosomes - Sex chromosomes c) Lamplorush - Diplotene bivalents chromosomes
 d) Polytene - Oocytes of chromosomes amphibians
251. In XO type of sex determination
- a) females produce two different types of gametes
 b) males produce two different types of gametes
 c) females produce gametes with Y chromosome
 d) males produce gametes with Y chromosome
252. Segregation of Mendelian factors (no linkage, no crossing over) occurs during_____
- a) anaphase-I b) anaphase-II c) diplotene d) metaphase-I
253. **Assertion:** Phenylpyruvic acid is excreted through urine in case of phenylketonuria.
Reason: The affected individual lacks enzyme phenylalanine hydroxylase
- a)
 If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false
254. Which one of the following conditions in humans, is correctly matched with its chromosomal abnormality/linkage?
- a) Klinefelters syndrome - 44 autosomes + XXY b) Colour blindness - Y - linked
 c) Erythroblastosis foetalis - X - linked d) Downs syndrome -44 autosomes +XO
255. Which contribute to the success of Mendel?
- a) Qualitative analysis of data b) Observation of distinct inherited traits
 c) His knowledge of Biology d) Consideration of one character at one time
256. A mutation at one base of the first codon of a gene produces a non-functional protein. Such a mutation is referred as _____ .
- a) frameshift mutation b) mis-sense mutation c) non-sense mutation
 d) reverse mutation
257. RR (red) Antirrhinum is crossed with WW (white) one. Offspring RW are pink. This is an example of_____
- a) dominant-recessive b) incomplete dominance c) hybrid d) supplementary genes
258. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments?
- a) Six b) Eight c) Seven d) Five

259. Study the given pedigree chart for sickle-cell anaemia and select the most appropriate option for the genotypes.



a)

Genotypes of parents	Genotypes of 1st and 3rd child in F_1
$Hb^A Hb^S$, $Hb^A Hb^A$	$Hb^A Hb^A$, $Hb^A Hb^S$

b)

Genotypes of parents	Genotypes of 1st and 3rd child in F_1
$Hb^A Hb^S$, $Hb^A Hb^S$	$Hb^A Hb^A$, $Hb^A Hb^A$

c)

Genotypes of parents	Genotypes of 1st and 3rd child in F_1
$Hb^A Hb^A$, $Hb^A Hb^S$	$Hb^A Hb^A$, $Hb^S Hb^S$

d)

Genotypes of parents	Genotypes of 1st and 3rd child in F_1
$Hb^A Hb^S$, $Hb^A Hb^S$	$Hb^A Hb^S$, $Hb^S Hb^S$

260. It is said that Mendel proposed that the factor controlling any character is discrete and independent. His proposition was based on the

a) results of F_3 generation of a cross

b)

observations that the offspring of a cross made between the plants having two contrasting characters shows only one character without any blending

c) self pollination of F_1 offsprings

d) cross pollination of F_1 generation with recessive parent

261. Among the seven pairs of contrasting traits in pea plant as studied by Mendel, the number of traits related to flower, pod and seed respectively were

a) 2,2,2 b) 2,2,1 c) 1,2,2 d) 1,1,2

262. Sickle cell anaemia is _____

a)

caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin.

b) caused by a change in a single base pair of DNA

c) characterised by elongated sickle like RBCs with a nucleus.

d) an autosomal linked dominant trait

263. Fruit shape in shepherd's purse (*Capsella bursa*) is of two types-triangular and top-shaped. Triangular fruit shape (T) is dominant over top-shape (t). Following table summarises the results of several crosses.

Cross	Result
Strain 1 \times tt	All triangular
Strain 2 \times tt	1 triangular: 1 top-shaped
Strain 3 \times tt	All top-shaped

Cross	Result
Strain 4 \times Tt	3 triangular: 1 top-shaped

Which pair of strains possess the genotype Tt?

- a) Strains 2 and 3 b) Strains 2 and 4 c) Strains 1 and 3 d) Strains 1 and 4

264. At a particular locus, frequency of 'A' allele is 0.6 and that of 'a' is 0.4. What would be the frequency of heterozygotes in a random mating population at equilibrium?

- a) 0.36 b) 0.16 c) 0.24 d) 0.48

265. A colourblind woman marries a normal visioned male. In the offspring_____

- a) both son and daughter are colour blind b) all daughters are colour blind
c) all sons are normal d) all sons are colour blind

266. Hybridisation between Tt \times tt gives rise to the progeny of ratio _____ .

- a) 1: 1 b) 1: 2: 1 c) 1: 2 d) 4: 1

267. In a test cross involving F₁ dihybrid flies, more parental type offspring were produced than the recombinant type offspring. This indicates:

- a) Chromosomes failed to separate during meiosis
b) The two genes are linked and present on the same chromosome
c) Both of the characters are controlled by more than one gene
d) The two genes are located in two different chromosomes

268. Which of the following is an example of sex linked disease?

- a) AIDS b) Colour blindness c) Syphilis d) Gonorrhoea

269. F₂ generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1: 2: 1. It represents a case of:

- a) Monohybrid cross with complete dominance
b) Monohybrid cross with incomplete dominance c) Codominance d) Dihybrid cross

270. Test cross is crossing between:

- a) Genotype with dominant trait b) Genotype with recessives trait
c) F₁ hybrid with double recessive d) Two F₁ hybrids

271. One of the parents of a cross has a mutation in its mitochondria. In that cross, that parent is taken as a male. During segregation of F, progenies that mutation is found in_____ .

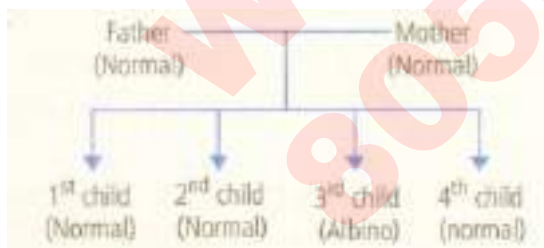
- a) one-third of the progenies b) none of the progenies c) all the progenies
d) fifty percent of the progenies

272. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Dihybrid test cross	(i) 9: 3: 3: 1
B. Law of segregation	(ii) Dihybrid cross
C. Law of independent assortment	(iii) 1: 1: 1: 1
D. ABO blood group in man	(iv) Purity of gametes
	(v) Multiple allelism

- a) A-(iii), B-(iv), C-(ii), D-(v) b) A-(i), B-(iv), C-(ii), D-(v) c) A-(iii), B-(ii), C-(iv), D-(v)
d) A-(ii), B-(v), C-(iii), D-(i)
273. A gene is said to be dominant if _____.
a) it expresses its effect only in homozygous state
b) it expresses its effect only in heterozygous condition
c) it expresses its effect both in homozygous and heterozygous condition
d) it never expresses its effect in any conditions
274. A disease caused by an autosomal primary nondisjunction is _____.
a) Klinefelter's syndrome b) Turner's syndrome c) Sickle Cell anemia
d) Down's syndrome
275. In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is _____.
a) 0.4 b) 0.5 c) 0.6 d) 0.7
276. A dihybrid test cross ratio for two completely linked genes will be
a) 1:1:1:1 b) 1:1 c) 1:7:7:1 d) 7:1:1:7
277. The recombinant phenotypic ratio in F_2 generation obtained from parental cross having genotypes TTRR x ttrr will be
a) 9:3:3:1 b) 3:1 c) 1:2:1 d) 3:3
278. A normal-visioned man whose father was colour-blind, marries a woman whose father was also colour blind. They their first child as a daughter. What are the chances that his child would be colour-blind?
a) 100% b) zero percent c) 25% d) 50%

279.



- If A = normal allele, a = albino allele, then genotypes of father and mother are respectively
a) Aa and Aa b) AA and Aa c) Aa and AA d) Aa and aa
280. Select the correct statements regarding honeybees
(i) The queen bee and the worker bees develop from fertilised eggs and are sexually females.
(ii) Males (drones) develop parthenogenetically from unfertilised eggs.
(iii) Queen bee feeds upon royal jelly and the worker bees feed upon bee bread.
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)
281. Which of the following pairs is wrongly matched?
a) XO type SexDetermination: Grasshopper
b) XO type SexDetermination: Grasshopper

- c) Starch synthesis in Pea: Multiple alleles. d) T.H. Morgan: Linkage
282. **Assertion:** In pigeons, females are heterogametic and males are homogametic.
Reason: In pigeons, females have ZW sex chromosomes and males have ZZ sex chromosomes.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false
283. In his classic experiments on Pea plants, Mendel did not use____
a) Pod length b) Seed shape c) Flower position d) Seed colour
284. The genetic defect-Adenosine deaminase (ADA) deficiency may be cured permanently by____
a) administering adenosine deaminase activators.
b) introducing bone marrow cells producing ADA into cells at early embryonic stages.
c) enzyme replacement therapy.
d) periodic infusion of genetically engineered lymphocytes having functional ADA cDNA.
285. In a dihybrid cross AABB x aabb, F₂ progeny of AABB, AABb, AaBB and AaBb occurs in the ratio of_____.
a) 1: 1: 1: 1 b) 9: 3: 3: 1 c) 1: 2: 2: 1 d) 1: 2: 2: 4
286. Human blood grouping is called ABO instead of ABC because O signifies.
a) No antigen b) Over-dominance c) One antibody d) Other antigen
287. A gene pair hides the effect of another. The phenomenon is_____.
a) epistasis b) dominance c) mutation d) None of these
288. Mendel's Law of independent assortment holds good for genes situated on the
a) non-homologous chromosomes b) homologous chromosomes
c) extra nuclear genetic element d) same chromosome
289. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by____
a) Gregor J. Mendel b) Alfred Sturtevant c) Sutton Boveri d) T.H. Morean
290. Haploids are more suitable for mutation studies than the diploids. This is because____
a) haploids are reproductively more stable than diploids
b) mutagens penetrate in haploids more effectively than diploids
c) haploids are more abundant in nature than diploids
d) all mutations, whether dominant or recessive are expressed in haploids
291. Test cross involves_____
a) crossing between two F₁ hybrids
b) crossing the F₁ hybrid with a double recessive genotype

- c) crossing between two genotypes with dominant trait
d) crossing between two genotypes with recessive trait
292. In a certain taxon of insects some have 17 chromosomes and the others have 18 chromosomes. The 17 and 18 chromosome-bearing organisms are
a) males and females, respectively b) females and males, respectively c) all males
d) all females.
293. Diploid chromosome number in humans is ____
a) 46 b) 44 c) 48 d) 42
294. Klinefelter's syndrome is characterised by a karyotype of
a) XYY b) XO c) XXX d) XXY
295. In *Antirrhinum* two plants with pink flowers were hybridised. The F₁ plants produced red, pink and white flowers in the proportion of 1 red, 2 pink and 1 white. What would be the genotype of the two plants used for hybridisation? Red flower colour is determined by RR and white by rr genes:
a) rr b) Rr c) RR d) Rrr
296. Failure of segregation of chromatids during cell division results in the gain or loss of chromosomes, this is called as
a) euploidy b) monoploidy c) aneuploidy d) polyploidy
297. Find out the mismatched pair
a) Haemophilia -Sex linked recessive b) Cystic fibrosis -Autosomal recessive
c) Down's syndrome -Trisomy 21 d) Turner's syndrome - Y-linked
298. **Assertion:** The law of independent assortment can be studied by means of dihybrid cross.
Reason: The law of independent assortment is applicable only to linked genes.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
299. In four o' clock plants, the gene for red flower colour (R) is incompletely dominant over the gene for white flower colour (r), hence the plants heterozygous for flower colour (Rr) have pink flowers. What will be the ratio of offsprings in a cross between red flowers and pink flowers?
a) 75% red flowers, 25% pink flowers b) All red flowers
c) 50% red flowers, 50% pink flowers d) Red: pink: white: : 1 : 2 : 1
300. Refer the given statements.
(i) Incomplete or mosaic inheritance is an example of pre-Mendelian concept of blending inheritance.

(ii) Test cross is a special type of back cross.

(iii) Chromosomal aberrations are commonly observed in cancer cells.

(iv) Thalassaemia is a Mendelian disorder.

Which of the above statements are correct?

a) (i) and (ii) only b) (ii), (iii) and (iv) c) (ii) and (iv) only d) (i) and (iv) only

301. Chromosome maps/genetic maps were first prepared by:

a) Sutton and Boveri (1902) b) Bateson and Punnett (1906) c) Morgan (1910)
d) Sturtevant (1911).

302. Find odd one out (W.r.t. pea traits).

a) Yellow ootyledon b) Yellow pod c) Terminal flower d) Constricted pod

303. **Assertion:** The pink coloured flowers appear in F_2 generation of plant **Mirabilis jalapa**

Reason: This is observed due epistatic suppression of white colour alleles in one of parental flowers by red colour alleles.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false

304. Mendel's law which is universal without any deviation is

a) Law of deminance b) Law of segregation c) Law of independent assortment
d) principle factor

305. Refer to the given figure.



The shape of RBCs under oxygen tension in the given situation becomes

a) biconcave disc like b) elongated and curved c) circular d) spherical.

306. Person having genotype $I^A I^B$ would show the blood group as AB. This is because of

a) pleiotropy b) co-dominance c) segregation d) incomplete dominance

307. The movement of a gene from one linkage group of another is called:

a) Inversion b) Duplication c) Translocation d) Crossing over

308. The most striking example of point mutation is found in a disease called ____

- a) thalassemia b) night blindness c) Down's syndrome d) sickle-cell anaemia

309. In fruit flies, long wing is dominant to vestigial wing. When heterozygous long-winged flies were crossed with vestigial-winged flies, 192 offsprings were produced. If an exact Mendelian ratio had been obtained, then the number of each phenotype would have been

a)

Long-winged	Vestigial-winged
64	128

b)

Long-winged	Vestigial-winged
96	96

c)

Long-winged	Vestigial-winged
128	64

d)

Long-winged	Vestigial-winged
192	0

310. **Assertion:** Mendel conducted artificial pollination Reason: When two genes in a dihybrid are on the experiments for his genetic studies using true-breeding same chromosome, the proportion of parental gene pea lines. combinations are much higher than the non-parental

Reason: A true-breeding line shows the stable trait type. inheritance and expression for several generations.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

311. "When two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent of the other pair of characters". The statement explains which of the following laws/principles of Mendel?

- a) Principle of paired factors b) Principle of dominance c) Law of segregation
d) Law of independent assortment

312. A recessive allele is expressed in

- a) heterozygous condition only b) homozygous condition only c) F_3 generation
d) both homozygous and heterozygous conditions

313. Chromosomal theory of inheritance was given by

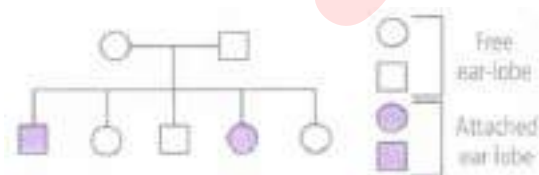
- a) Morgan et al b) Sutton and Boveri c) Hugo de Vries d) Gregor J. Mendel

314. Select the incorrect statement_____

- a) In male grasshoppers 50 % of sperms have no sex-chromosome
b) In domesticated fowls, sex of progeny. depends on the type of sperm rather than egg
c) Human males have one of their sexchromosome much shorter than the other
d) Male fruit fly is heterogametic.

315. A and B genes are linked what shall be genotype of progeny in a cross between AB/ab and ab/ab?

- a) AAbb and aabb b) AaBb and aabb c) AABB and aabb d) None of these
316. Number of autosomes present in liver cells of a human female is
a) 22 autosomes b) 22 pairs c) 23 autosomes d) 23 pairs
317. Point mutation involves _____.
a) change in single base pair b) duplication c) deletion d) insertion
318. Multiple alleles are present ____
a) at different loci on the same chromosome b) at the same locus of the chromosome
c) on non-sister chromatids d) on different chromosomes
319. Identify the wrong statement with reference to the gene 'I' that controls ABO blood groups _____.
a) When I^A and I^B are present together, they express same type of sugar
b) Allele 'i' does not produce any sugar c) The gene (I) has three alleles
d) A person will have only two of the three alleles
320. A woman with two genes (one on each X-chromosome) for haemophilia and one gene for colour blindness on the X-chromosomes marries a normal man. How will the progeny be?
a) All sons and daughters haemophilic and colour blind
b) Haemophilic and colour blind daughters
c) 50% haemophilic colour blind sons and 50% haemophilic sons
d) 50% haemophilic daughters and 50% colour blind daughters
321. A man having the genotype EEFfGgHH can produce P number of genetically different sperms, and a woman of genotype liLLMmNn can generate Q number of genetically different eggs. Determine the values of P and Q.
a) $P = 4, Q = 4$ b) $P = 4, Q = 8$ c) $P = 8, Q = 4$ d) $P = 8, Q = 8$
322. Mendel's work was rediscovered by three scientists in the year
a) 1865 b) 1900 c) 1910 d) 1920
323. Given pedigree chart depicts the inheritance of attached ear lobes, an autosomal recessive trait.

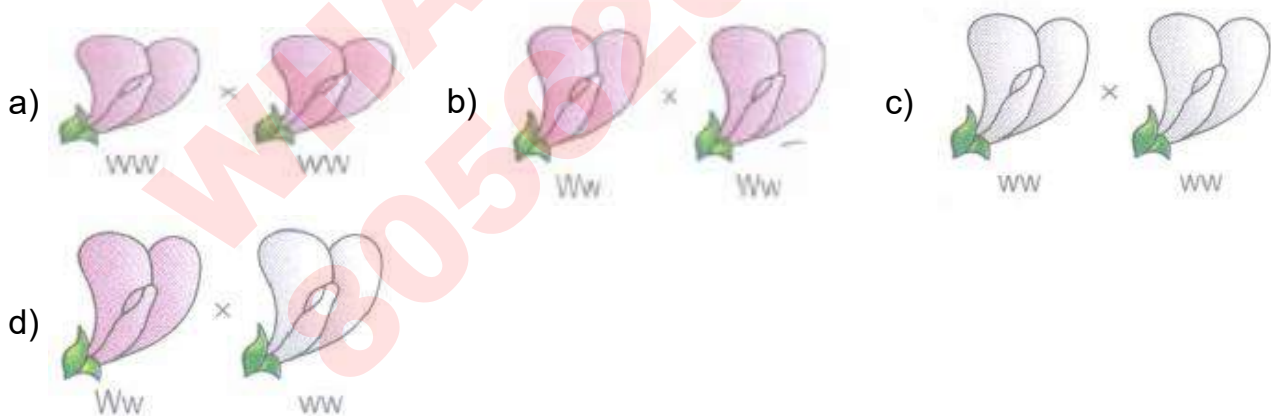


- Which of the following conclusions drawn is correct?
a) Parents are heterozygous. b) Parents are homozygous dominant.
c) Parents are homozygous recessive. d) None of these
324. Thalassaemia and sickle cell anemia are caused due to a problem in globin molecule synthesis. Select the correct statement _____.
a) Both are due to a quantitative defect in globin chain synthesis
b) Thalassaemia is due to less synthesis of globin molecules
c) Sickle cell anemia is due to a qualitative problem of globin molecules
d) Both are due to a qualitative defect in globin chain synthesis

325. Probability of obtaining genotype AABbCc in the cross between AaBbCc x AaBbCc is:
a) $\frac{1}{16}$ b) $\frac{1}{8}$ c) $\frac{1}{32}$ d) $\frac{1}{64}$
326. Which of the following most appropriately describe haemophilia
a) Dominant gene disorder b) Recessive gene disorder
c) X-linked recessive gene disorder d) Chromosomal disorder
327. Dihybrid test cross ratio with 82% parental type and 18% recombinants type shows that genes have
a) Incomplete linkage b) Independent assortment c) Complete linkage
d) Both (1) & (2)
328. Depending upon the distance between any two genes which is inversely proportional to the strength of linkage, cross overs will vary from
a) 50-100% b) 0-50% c) 75-100% d) 100-150%.
329. The percentage of ab gamete produced by AaBb parent will be
a) 25% b) 50% c) 75% d) 12.5%.
330. What can be the blood group of offspring when both parents have AB blood group?
a) AB only b) A, B and AB c) A, B, AB and O d) A and B only
331. In mice, Y is the dominant allele for yellow fur and y is the recessive allele for grey fur. Since Y is lethal when homozygous, the result of cross Yy x Yy will be
a) 3 yellow: 1 grey b) 2 yellow: 1 grey c) 1 yellow: 1 grey d) 1 yellow: 2 grey.
332. **Assertion:** When yellow bodied, white eyed **Drosophila** females were hybridised with brown-bodied, red eyed males; and F₁ progeny was intercrossed, F₂ ratio deviated from 9:3:3:1
Reason: When two genes in a dihybrid are on the same chromosome, the proportion of parental gene combinations are much higher than the non-parental type.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
333. What is true about the crossing over between linked genes?
a) No crossing over at all b) High percentage of crossing over
c) Hardly any crossing over d) None of these
334. What will be the distribution of phenotypic features in the first filial generation after a cross between a homozygous female and a heterozygous male for a single locus?
a) 3: 1 b) 1: 2: 1 c) 1: 1 d) None of these
335. Pattern baldness, moustaches and beard in human males are examples of ____

- a) sex-determining traits b) sex linked traits c) sex limited traits
d) sex influenced traits
336. Which of the following is not a hereditary disease?
a) Cystic fibrosis b) Thalassemia c) Haemophilia d) Cretinism
337. The possibility of a female becoming haemophilic is extremely rare because mother of such a female has to be at least (i) and father should be (ii).
a) (i) haemophilic, (ii) carrier b) (i) carrier, (ii) haemophilic
c) (i) haemophilic, (ii) normal d) (i) haemophilic, (ii) haemophilic
338. ABO blood grouping in human beings cites the example of
a) incomplete dominance b) co-dominance c) multiple allelism d) both (b) and (c).
339. Read the given statements and select the correct option.
Statement 1: The law of segregation is one of the most important contributions to the biology.
Statement 2: It introduced the concept of heredity factors as discrete physical entities which do not become blended.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.
340. Match column I with column II and select the correct option from the given codes.
- | Column I | Column II |
|----------------------|------------------------------------|
| A. Multiple allelism | (i) $Tt \times tt$ |
| B. Back cross | (ii) $Tt \times TT$ |
| C. Test cross | (iii) Human blood groups |
| D. Crossing over | (iv) Non-parental gene combination |
| E. Recombination | (v) Non-sister chromatids |
- a) A-(iii), B-(i), C-(ii), D-(v), E-(iv) b) A-(iii), B-(ii), C-(i), D-(v), E-(iv)
c) A-(iii), B-(ii), C-(i), D-(iv), E-(v) d) A-(iv), B-(ii), C-(i), D-(v), E-(iii)
341. A self-fertilising trihybrid plant forms _____ .
a) 8 different gametes and 64 different zygotes
b) 4 different gametes and 16 different zygotes
c) 8 different gametes and 16 different zygotes
d) 8 different gametes and 32 different zygotes
342. Which of the following statements is not true of two genes that show 50% recombination frequency?
a) The genes are tightly linked b) The genes show independent assortment
c)
If the genes are present on the same chromosome, they undergo more than one crossovers in every meiosis

- d) The genes may be on different chromosomes
343. A test cross is carried out to:
- a) Predict whether two traits are linked
 - b) Assess the number of alleles of a gene
 - c) Determine the genotype of F₂ plant
 - d) Determine whether two species or varieties will breed successfully
344. Select the incorrect statement regarding pedigree analysis
- a) Solid symbols show unaffected individuals
 - b) Proband is the person from which case history starts.
 - c) It is useful for genetic counsellors.
 - d) It is an analysis of traits in several generations of a family.
345. The grain colour of wheat is determined by the additive effect of two pairs of genes. Accordingly the F₂ inheritance appears in the ratio of 15 red:1 white. The fifteen red appear in different shades in the ratio of
- a) 9:3:3
 - b) 6:6:3
 - c) 1:4:7:3
 - d) 1:4:6:4
346. Thalassaemia is a recessive autosomal disease due to:
- a) Base substitution of 6th codon in the gene coding for β -chain haemoglobin
 - b) Reduced synthesis of α and β polypeptide of haemoglobin
 - c) Absence of phenylalanine hydroxylase
 - d) defective glycoproteins
347. Which of the following is a test cross?



348. If both parents are carriers for thalassemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?
- a) 50%
 - b) 25%
 - c) 100%
 - d) no chance
349. A couple has six daughters. What is the possibility of their having a girl next time?
- a) 10%
 - b) 50%
 - c) 90%
 - d) 100%
350. Bridge between two generations which contributes equally in the heredity of the offspring is
- a) Chromosome
 - b) Somatic cells
 - c) Sperm and egg
 - d) Factor
351. **Assertion:** ABO blood group system provides a good example of multiple alleles.
Reason: In ABO blood group system, when I^A and I^B alleles are present together, they both express their own types.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

352. Result of a cross between a normal homozygous female and a haemophiliac male would be

a) normal males and normal females b) haemophilic males and normal females

c) normal males and carrier females d) haemophilic males and carrier females

353. ZZ/ZW type of sex determination is seen in

a) platypus b) snails c) cockroach d) peacock.

354. **Assertion:** Variety of fruit colours in **Cucurbita pepo** is result of recessive epistasis.**Reason:** In recessive epistasis, a recessive gene at one locus enhances the expression of another gene, at a different locus

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

355. A tobacco plant heterozygous for a recessive character is self-pollinated and 1200 seeds are subsequently germinated. How many seedlings would have the parental genotype?

a) 1250 b) 600 c) 300 d) 2250

356. How many types of genetically different gametes will be produced by a heterozygous plant having genotype AABbCc?

a) Two b) Four c) Six d) Nine

357. Study the two cases carefully. What would be the correct interpretation of the two cases?

Case	Mother	Father	Children
Case I	With disease	Normal	Sons always with diseases
Case II	With disease	Normal	Sons and daughters could show disease

Case I: X-linked recessive disease

Case I: Y-linked recessive disease

a) Case II: Autosomal recessive disease b) Case II: X-linked recessive disease

Case I: and II: X-linked recessive disease

Case I: X-linked dominant disease

c) Case II: X-linked recessive disease

d) Case II: Autosomal dominant disease

358. Match the terms in Column I with their description in column II and choose the correct option

Column I	Column II
(A) Dominance	(i) Many genes govern a single character
(B) Co-dominance	(ii) In a heterozygous organisms only one allele expresses itself
(C) Pleiotropy	(iii) In a heterozygous organism both alleles express themselves fully
(D) Polygenic inheritance	(iv) A single gene influences many characters

a)

A	B	C	D
(ii)	(iii)	(iv)	(i)

b)

A	B	C	D
(iv)	(i)	(ii)	(iii)

c)

A	B	C	D
(iv)	(iii)	(i)	(ii)

d)

A	B	C	D
(ii)	(i)	(iv)	(iii)

359. A dihybrid condition is _____

- a) ttRr b) Ttrr c) ttrr d) TtRr

360. Multiple alleles control inheritance of _____

- a) phenyl ketonuria b) colour blindness c) sickle-cell anaemia d) blood groups

361. **Assertion:** At F_2 stage in monohybrid cross, both parental traits are expressed in the proportion of 3: 1.

Reason: The contrasting parental traits show blending at F_2 stage.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

- c) If assertion is true but reason is false d) If both assertion and reason are false

362. An individual homozygous for genes cd is crossed with wild type ++ and F_1 crossed back with the double recessive. The appearance of the offsprings is as follows

++ → 903

cd → 897

+d → 98

c+ → 102

The distance between the genes c and d is

- a) 20 map units b) 9.8 map units c) 10.2 map units d) 10 map units

363. The incorrect statement with regard to Haemophilia is _____

- a) It is a recessive disease b) It is a dominant disease
c) A single protein involved in the clotting of blood is affected
d) It is a sex-linked disease

364. Which Mendelian cross can produce two genotypes and two phenotypes?

- a) Monohybrid cross b) Monohybrid test cross c) Incomplete dominance
d) Codominance

365. A cell at telophase stage is observed by a student in a plant brought from the field. He tells his teacher that this cell is not like other cells at telophase stage. There is no formation of cell plate and thus the cell is containing more number of chromosomes as compared to other dividing cells. This would result in_____

- a) Aneuploidy b) Polyploidy c) Somaclonal variation d) Polyteny

366. In honeybees, females are __(i)__ having__(ii)__chromosomes and males are__(iii)__having__(iv)__chromosomes.

a)

i	ii	iii	iv
diploid	46	haploid	23

b)

i	ii	iii	iv
haploid	23	diploid	46

c)

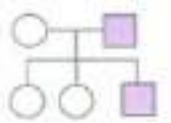
i	ii	iii	iv
diploid	32	haploid	16

d)

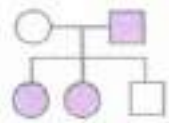
i	ii	iii	iv
haploid	16	diploid	32

367. Wife is PTC non-taster and husband is PTC taster. Their son is taster but daughters are non-tasters. This is not a sex linked trait. Which pedigree is correct?

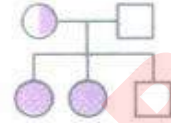
a)



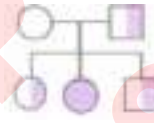
b)



c)



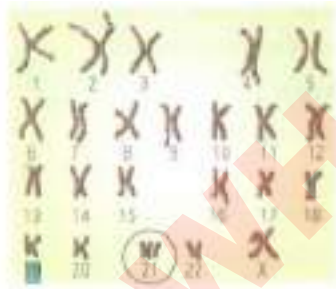
d)



368. Father of polygenic inheritance is

- a) Davenport b) Kolreuter c) Galton d) Emerson and East

369. Refer to the given figure representing karyotype of individual who inflicted with this chromosomal disorder.



Select the correct statement regarding them.

a)

This disorder occurs due to failure of segregation of chromatids during cell division cycle results in the gain of chromosome.

b)

This disorder occurs due to failure of cytokinesis after telophase stage of cell division results in an increase in whole set of chromosome.

c) Individuals inflicted with this disorder are usually sterile. d) Both (a) and (c)

370. Genes located very close to one another on same chromosome tend to be transmitted together and are called as

- a) allelomorphs b) identical genes c) linked genes d) recessive genes.

371. An allele is the

- a) Total number of genes for a trait b) Total number of genes on chromosome
c) Alternative forms of a gene d) Alternative forms of a character

372. Genetic identity of a human male is determined by_____ .

- a) autosome b) nucleolus c) sex chromosome d) cell organelles
373. What proportion of the offsprings obtained from cross AABBCC x AaBbCc will be completely heterozygous for all the genes segregated independently?
a) $1/8$ b) $1/4$ c) $1/2$ d) $1/16$
374. A man with a certain disease marries a normal woman. They have eight children (3 daughters and 5 sons). All the daughters suffer from their father's disease but none of the sons are affected. Which of the following mode of inheritance do you suggest for this disease?
a) Sex-linked recessive b) Sex-linked dominant c) Autosome dominant
d) Sex-limited recessive
375. Which of the following is incorrect regarding ZW-ZZ type of sex determination
a) It occurs in birds and some reptiles
b) Females are homogametic and males are heterogametic.
c) 1: 1 sex ratio is produced in the offsprings. d) All of these
376. Mendel's law of independent assortment does not hold true for the genes that are located closely on:
a) same chromosome b) non-homologous chromosomes c) X-chromosome
d) autosomes
377. Which of the following is correct for the condition when plant YyRr is back crossed with the double recessive parent?
a) 9: 3: 3: 1 ratio of phenotypes only b) 9: 3: 3: 1 ratio of genotypes only
c) 1: 1: 1: 1 ratio of phenotypes only d) 1: 1: 1: 1 ratio of phenotypes and genotypes
378. A certain road accident patient with unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor?
a) Blood group B b) Blood group AB c) Blood group O d) Blood group A
379. All genes located on the same chromosome
a) form different groups depending upon their relative distance
b) form one linkage group c) will not form any linkage groups
d) form interactive groups that affect the phenotype.
380. Which of the following characteristics represents 'Inheritance of blood groups' in humans?
1. Dominance
2. Codominance
3. Multiple allele
4. Incomplete dominance
5. Polygenic inheritance
a) 2, 4 and 5 b) 1, 2 and 3 c) 2, 3 and 5 d) 1, 3 and 5
381. The inheritance pattern of a gene over generations among humans is studied by the pedigree analysis Character studied in the pedigree analysis is equivalent to

a) quantitative trait b) Mendelian trait c) polygenic trait d) maternal trait.

382. A polygenic inheritance in human beings is _____ .

a) skin colour b) phenylketonuria c) colour blindness d) sickle-cell anaemia

383. In a monohybrid cross between two heterozygous individuals, the percentage of pure homozygous individuals obtained in F_1 generation will be:

a) 25% b) 50% c) 75% d) 100%

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**RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308****Time : 1 Mins****MOLECULAR BASIS OF INHERITANCE 1 1****Marks : 1158**

- During breeding the removal of anthers from a flower is called
a) Anthesis b) Pollination c) Emasculation d) Vasectomy
- Polycistronic messenger RNA (mRNA) usually occurs in
a) bacteria b) prokaryotes c) eukaryotes d) both (a) and (b).
- Initiation codon of protein synthesis (in eukaryotes) is _____
a) GUA b) GCA c) CCA d) AUG
- The given flow chart shows central dogma reverse.



Enzymes used in processes A, B and C are respectively

a)

A	B	C
RNA dependent	DNA dependent	RNA dependent
DNA polymerase	RNA polymerase	RNA polymerase

b)

A	B	C
DNA dependent	RNA dependent	DNA dependent
DNA polymerase	DNA polymerase	RNA polymerase

c)

A	B	C
DNA dependent	DNA dependent	RNA dependent
DNA polymerase	RNA polymerase	DNA polymerase

d)

A	B	C
DNA dependent	DNA dependent	RNA dependent
RNA polymerase	DNA polymerase	DNA polymerase

- F_2 generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1:2:1. It represents a case of:
a) Monohybrid cross with complete dominance
b) Monohybrid cross with incomplete dominance c) Co-dominance d) Dihybrid cross
- What would be the base sequence of RNA transcript obtained from the given DNA segment?
5' - G C A T T C G G C T A G T A A C - 3' Coding strand of DNA
3' - C G T A A G C C G A T C A T T G - 5' Non-coding strand of DNA

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- a) 5' - G C A U U C G G C U A G U A A C - 3' b) 5' - C G U A A G C C G A U C A U U G -3'
c) 5' - G C A T T C G G C T A G T A A C - 3' d) 3' - C G T A A G C C G A T C A T T G -5'
7. DNA finger printing was invented by
a) Kary Mullis b) Alec Jeffery c) Dr. Paul Berg d) Francis Collins
8. Which one of the following pairs of nitrogenous bases of nucleic acids, is wrongly matched with the category mentioned against it?
a) Thymine, Uracil - Pyrimidines b) Uracil, Cytosine - Pyrimidines
c) Guanine, Adenine - Purines d) Adenine, Thymine - Purines
9. Linkage is a tendency of alleles of different genes to assort together in :
a) Meiosis b) Mitosis c) X-Y linkage d) Inversion
10. Read the sequence of nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain to answer the Q. nos. 65 and 66.
- mRNA AUG UUU AUG CCU GUU UCU UAA
Polypeptide Met—Phe—Met—Pro—Val—Ser
- Nucleotide sequence of the DNA strand from which this mRNA was transcribed is
a) TAC AAA TAC GGA CAA AGA ATT b) AUG UUU AUG CCU GUU UCU UAA
c) UAC AAA UAC GGA CAA AGA AUU d) ATG TTT ATG CCT GTT TCT TAA.
11. Methyl guanosine triphosphate is added to the 5' end of hnRNA in a process of
a) splicing b) capping c) tailing d) none of these.
12. Which of the following statements is the most appropriate for sickle cell anaemia?
a) It cannot be treated with iron supplements. b) It is a molecular disease.
c) It confers resistance to acquiring malaria. d) All of the above.
13. Spliceosomes are not found in cells of _____
a) Fungi b) Animals c) Bacteria d) plants
14. Biochemical characterisation of transforming principle was done by
a) Hershey and chase b) Morgan c) Meischer d) Avery, MacLeod and McCarty
15. Histone proteins are
a) basic, negatively charged b) basic, positively charged c) acidic, positively charged
d) acidic, negatively charged.
16. Largest gene of human genome is _____ and it is located on _____ chromosome.
a) DMD, X b) TDF, Y c) Sry, X d) Sxl, X
17. Read the following four statements (A - D).
(A) In transcription, adenosine pairs with uracil
(B) Regulation of lac operon by repressor is referred to as positive regulation
(C) The human genome has approximately 50,000 genes
(D) Haemophilia is a sex-linked recessive disease
How many of the above statements are right?
a) Two b) Three c) Four d) One
18. If the sequence of nitrogen bases of the coding strand of DNA in a transcription unit is: 5' - A T G A A T G - 3', the sequence of bases in its RNA transcript would be:

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- a) 5' - AU GAAU G - 3' b) 5' - UACU UAC- 3' c) 5' - CAU UCAU - 3'
d) 5'-GUAAGUA-3'.

19. In a mutational event, when adenine is replaced by guanine, it is a case of _____
a) frame shift mutation b) transcription c) transition d) transversion
20. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments?
a) Six b) Eight c) Seven d) Five
21. Anticodon is an unpaired triplet of bases in an exposed position of _____
a) mRNA b) rRNA c) tRNA d) sRNA
22. Match the terms in Column-I with their description in Column-II and choose the correct option:

Column-I	Column-II
(a) Dominance	(i) Many genes govern a single character
(b) Codominance	(ii) In a heterozygous organism only one allele expresses itself
(c) Pleiotropy	(iii) In a heterozygous organism both alleles express themselves fully
(d) Polygenic inheritance	(iv) A single gene influence many characters

a)	b)	c)	d)
(a)(b)(c)(d)	(a)(b)(c)(d)	(a)(b)(c)(d)	(a)(b)(c)(d)
ii i iv iii	ii iii iv i	iv i ii iii	iv iii i ii

23. The unequivocal proof of DNA as the genetic material came from studies on a
a) Viriod b) Bacterial virus c) Bacterium d) Fungus
24. A codon is made up of
a) single nucleotide b) two nucleotides c) three nucleotides d) four nucleotides
25. A nutritionally wild type organism, which does not require any additional growth supplement is known as:
a) prototroph b) phenotype c) Holotype d) Auxotroph
26. Genetic drift operates in :
a) Non- reproductive population b) slow reproductive population
c) Small isolated population d) Large isolated population
27. Whose experiments cracked DNA and discovered triplet nature of genetic code?
a) Nirenberg and Mathaei b) Beadle and Tatum c) Hershey and Chase
d) Morgan and Sturtevant
28. While analysing the DNA of an organism a total number of 5386 nucleotides were found out of which the proportion of different bases were: Adenine = 29%, Guanine = 17%, Cytosine = 32%, Thymine = 17%. Considering the Chargaff's rule it can be concluded that
a) it is a double stranded circular DNA b) it is single stranded DNA
c) it is a double stranded linear DNA d) no conclusion can be drawn.
29. Translation refers to the process of-
a) Polymerisation of nitrogen bases b) Polymerisation of nucleotides
c) Polymerisation of nucleosides d) Polymerisation of amino acids
30. One of the following is true with respect to AUG

- a) it codes for methionine only b) it is also an initiation codon
c) it codes for methionine in both prokaryotes and eukaryotes d) all of the above
31. Removal of introns and joining of exons in a defined order during transcription is called ____
a) Looping b) Inducing c) Slicing d) Splicing
32. t-RNA attach to larger subunit of ribosome with the help of which loop
a) DHU-loop b) TΨC loop c) Anticodon loop d) Minor loop
33. Which of the following statements is correct regarding ribosomes?
a) Most of a cell's DNA molecule are stored there.
b) Complete polypeptide is released from there. c) mRNAs are produced there.
d) DNA replication takes place there.
34. Which is incorrect for genetic code-
(a) (i) The codon is triplet
(b) (ii) 64 codons code for amino acids
(c) (iii) Genetic code is unambiguous
(iv) Genetic code is nearly universal
(d) (v) AUG has dual functions
a) only ii b) ii & iii c) iii, iv + v d) All are correct
35. Fruit colour in squash is an example of
a) Recessive epistasis b) Dominant epistasis c) Complementary genes
d) Inhibitory genes
36. Double helix model of DNA which was proposed by Watson and Crick was of
a) C-DNA b) B-DNA c) D-DNA d) Z-DNA
37. No. of Bar Body in XXXX female
a) 1 b) 2 c) 3 d) 4
38. Gametes of AaBb individual can be:
a) Aa, Bb b) AB, ab c) AB, ab, aB d) AB, Ab, aB, ab
39. If Meselson and Stahl's experiment is continued for four generations in bacteria, the ratio of $^{15}\text{N}/^{15}\text{N}$: $^{15}\text{N}/^{14}\text{N}$: $^{14}\text{N}/^{14}\text{N}$ containing DNA in the fourth generation would be
a) 1: 1: 0 b) 1: 4: 0 c) 0: 1: 3 d) 0: 1: 7.
40. Which of the following is not produced by E. coli in the lactose operon
a) β galactosidase b) Thiogalactoside transacetylase c) Lactose dehydrogenase
d) Lactose permease
41. **Assertion:** Lac operon is a repressible operon.
Reason: The product of gene activity stops the activity of the said gene.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
42. The experimental proof for semiconservative replication of DNA was first shown in
a) _____.
a) plant b) bacterium c) fungus d) virus
43. Who rediscovered the results of Mendel's experiments:

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- a) DeVries, Tschemark, Correns b) DeVries, Tschemark, Morgan
c) Tschemark, Morgan, Correns d) Tschemark, Bateson, Punnet
44. If the sequence of bases in one strand of DNA is ATGCATGCA, what would be the sequence of bases on complementary strand?
a) ATGCATGCA b) AUGCAUGCA c) TACGTACGT d) UACGUACGU
45. How many different kinds of gametes will be produced by a plant having the genotype AABbCC?
a) Three b) Four c) Nine d) Two
46. Heterochromatin is
a) Genetically active b) Transcriptionally inactive c) Lightly stained
d) With loosely coiled DNA
47. The segment of master strand of DNA involved in transcription is called
a) Sense strand b) Cistron c) Recon d) Muton
48. Which one of the following is wrongly matched?
a) Transcription - Writing information from DNA to tRNA.
b) Translation - Using information in mRNA to make protein
c) Repressor protein - Binds to operator to stop enzyme synthesis
d) Operon - Structural genes, operator and promoter
49. Grey is dominant (G) over black (g). Which of the following will most probably give 50% black and 50% grey offspring?
a) GG x gg b) Gg x gg c) GG x Gg d) gg x gg
50. When a plant has two alleles of contrasting characters it is called
a) Homozygous b) Dioecious c) Heterozygous d) Monoecious
51. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the F₁ Plant were selfed the resulting genotype were in the ratio of:
a) 1:2:1 :: Tall homozygous : Tall heterozygous : Dwarf
b) 1:2:1 :: Tall heterozygous : Tall homozygous : Dwarf c) 3:1 :: Tall : Dwarf
d) 3:1 :: Dwarf : Tall
52. Inducible operon system usually occurs in _____(i)_____ pathways. Nutrient molecules serve as _____(ii)_____ to stimulate production of the enzymes necessary for their breakdown. Genes for inducible operon are usually switched _____(iii)_____ and the repressor is synthesised in an _____(iv)_____ form.
- a)
- | | | | |
|-----------|-------------|-------|----------|
| (i) | (ii) | (iii) | (iv) |
| catabolic | corepressor | on | inactive |
- b)
- | | | | |
|-----------|---------|-------|--------|
| (i) | (ii) | (iii) | (iv) |
| catabolic | inducer | off | active |
- c)
- | | | | |
|-----------|---------|-------|--------|
| (i) | (ii) | (iii) | (iv) |
| catabolic | inducer | off | active |
- d)
- | | | | |
|-----------|-------------|-------|----------|
| (i) | (ii) | (iii) | (iv) |
| catabolic | corepressor | on | inactive |
53. The number of linkage groups in a cell have 10 pairs of chromosomes are:
a) 5 b) 10 c) 15 d) 20

54. If number of aminoacids in a polypeptide chain is 50, what will be the number of nucleotides in its mRNA?
a) 50 b) 100 c) 150 d) 200
55. Which of the following cannot act as inducer?
a) Lactose b) Galactose c) Both (a) and (c) d) Glucose
56. m-RNA is attached with-
a) E.R b) Ribosome c) Nucleus d) Lysosome
57. Other than DNA polymerase, which of the following enzymes involved in DNA synthesis?
a) Topoisomerase b) Helicase c) RNA primase d) All of these
58. Which of the following statements is correct?
a) Adenine pairs with thymine through three H-bonds
b) Adenine does not pair with thymine c) Adenine pairs with thymine through two H-bonds
d) Adenine pairs with thymine through one H-bond.
59. Which of the following differences are incorrect between leading and lagging strands of DNA?

	Leading strand	Lagging strand
(i)	It does not require DNA ligase for its growth.	DNA ligase is required for joining Okazaki fragments.
(ii)	Formation of leading strand is slower.	Formation of lagging strand is quite rapid
(iii)	Its template opens in 5' → 3' direction.	Its template opens in 3' → 5' direction.
(iv)	Formation of leading strand begins immediately at the beginning of replication.	Formation of lagging strand begins a bit later than that of leading strand.

- a) (ii) and (iv) only b) (ii), (iii) and (iv) only c) (ii) and (iii) only d) (i), (ii) and (iii) only
60. You have created a fusion between trp operon and lac operon which encodes the enzymes for tryptophan biosynthesis, under the regulatory control of the lac operator. Under which of the following conditions will tryptophan synthase be induced in the strain that carries the chimeric operator fused operons?
a) Only when both lactose and glucose are absent.
b) Only when both lactose and glucose are present.
c) Only when lactose is absent and glucose is present
d) Only when lactose is present and glucose is absent.
61. Nucleic acids are made up of
a) Amino acids b) Pentose sugars c) Nucleosides d) Nucleotides
62. **Assertion:** The mechanism of DNA replication is semi- conservative in nature.
Reason : Each of the complementary strands of the parental double helix is conserved during the process
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

63. A useful process for determining whether an individual is homozygous or heterozygous is:
a) Cross-breeding b) self fertilization c) Back-crossing d) Test cross
64. Hypertrichosis is
a) Holandric character b) X-Linked character c) Diagenic character
d) Sex-influenced character
65. When a heterozygous tall pea plant of F_1 generation upon self fertilization produces tall and dwarf phenotypes it proves the principle of
a) Dominance b) Segregation c) Independent assortment
d) Inheritance & purity of gametes
66. Which one is not a part of transcription unit in DNA?
a) The inducer b) Promoter c) Terminator d) Structural gene
67. Match column I with column II and select the correct option from the given codes.

	Column I		Column II
A.	Sigma factor	(i)	5'-3'
B.	Capjling	(ii)	Initiation
C.	Tailing	(iii)	Termination
D.	Coding strand	(iv)	5' end
		(v)	3' end

- a) A-(iii), B-(v), C-(iv), D-(ii) b) A-(ii), B-(iv), C-(v), D-(i) c) A-(ii), B-(iv), C-(v), D-(iii)
d) A-(iii), B-(v), C-(iv), D-(i)
68. Find the correct match.

Column I	Column II
a. Non degenerate codon	(i) GUG
b. Ambiguous codon	(ii) UAG
c. Amber	(iii) UGG
d. Ochre	(iv) UGA
	(v) UAA

- a) a(iii), b(i), c(ii), d(v) b) a(i), b(ii), c(v), d(iii) c) a(iii), b(i), c(iv), d(v)
d) a(iii), b(i), c(v), d(ii)
69. In the base sequence of one strand of DNA is GAT, TAG, CAT, GAC what shall be the sequence of its complementary strand:
a) CAT, CTG, ATC, GTA b) GTA, ATC, CTG, GTA c) ATC, GTA, CTG, GTA
d) CTA, ATC, GTA, CTG
70. First experimental proof for semi-conservative DNA replication was shown in
a) Streptococcus pneumoniae b) Escherichia coli c) Neurospora crassa
d) Rattus rattus
71. Synthesis of DNA from RNA is explained by:
a) central dogma reverse b) reverse transcription c) teminism d) all of these
72. Control of gene expression takes place at the level of
a) DNA-replication b) transcription c) translation d) none of the above.

73. Genes that are involved in turning on or off the transcription of a set of structural genes are called _____
a) polymorphic genes b) operator genes c) reductant genes d) regulatory genes
74. When the codon of mRNA is 5'-GUC-3' then the anticodon on tRNA will be
a) 5'-CAG-3' b) 3'-CAG-5' c) 3'-CUG-5' d) 3'-CUG-5'
75. Which of the following is required as inducers) for the expression of lac operon?
a) Glucose b) Galactose c) Lactose d) Lactose and galactose
76. The process of copying genetic information from one strand of DNA to RNA is termed as _____.
a) replication b) transcription c) translation d) reverse transcription
77. Botanical name of pea plant is
a) Pisum sativum b) Pinus sativus c) Pyrus sativus d) Pisum sativus
78. DNA ligase is involved in
a) Formation of RNA primer b) Filling of gaps c) Joining of Okazaki fragments
d) Both (1) & (2)
79. How many linkage group are these in nuclear bacteria
a) One b) Two c) Four d) None
80. Transcription unit
a) starts with TATA box b) starts with palindrome regions and ends with rho factor
c) starts with promoter region and ends in terminator region d) starts with CAAT region.
81. Chemically, RNA is _____(i)_____ reactive and _____(ii)_____ stable as compared to DNA.
a) (i) equally, (ii) equally b) (i) less, (ii) more c) (i) more, (ii) less d) (i) more, (ii) equally
82. Extranuclear inheritance occurs in _____
a) peroxisome and ribosome b) chloroplast and mitochondria
c) mitochondria and ribosome d) chloroplast and lysosome
83. In cells of superfemale with 47 chromosomes (44+xxx) visible barr bodies are
a) 1 b) 0 c) 2 d) 3
84. Separation of DNA fragments into bands by electrophoresis is done on
a) Agarose gel b) Polyacrylamide gel c) Aminobenzyloxymethyl gel d) Both (1) & (2)
85. In pea plant, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F_1 generation:
a) 50:50 b) 9:1 c) 1:3 d) 3:1
86. Double helix model of DNA
a) Was given by Watson and Crick b) Suggests '3D' structure c) Was given for B-DNA
d) All of these
87. Match column I with column II and select the correct option from the given codes.

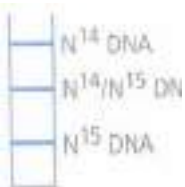
Column I		Column II
A. Translation	(i)	Aminoacyl tRNA synthetase
B. Transcription	(ii)	Okazaki fragments

Column I	Column II
C. DNA replication	(iii) RNA polymerase

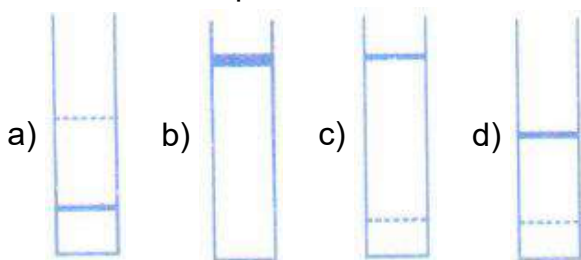
- a) A-(ii), B-(i), C-(iii) b) A-(i), B-(iii), C-(ii) c) A-(iii), B-(i), C-(ii) d) A-(ii), B-(iii), C-(i)
88. Select the two correct statements out of the four (a - d) given below about lac operon_____
- (i) Glucose or galactose may bind with the repressor and inactivate it
(ii) In the absence of lactose the repressor binds with the operator region
(iii) The z-gene codes for penicillinase
(iv) This was elucidated by Francois Jacob and Jacques Monod
- The correct statements are
a) (ii) and (iii) b) (i) and (iii) c) (ii) and (iv) d) (i) and (ii)
89. Select the correct statements regarding the process of transcription in eukaryotes.
- (i) The strand of dsDNA which takes part in transcription process is called as coding strand.
(ii) The enzyme RNA polymerase can catalyse polymerisation only in one direction i.e., 5'→3'.
(iii) An unusual nucleotide methyl guanosine triphosphate is added to the 5' end of hnRNA during capping.
(iv) During tailing process, adenylate residues (200 - 300) are added at 3' end in a template independent manner.
- a) (i) and (ii) b) (iii) and (iv) c) (ii), (iii) and (iv) d) (i), (ii), (iii) and (iv)
90. In Drosophila male differentiation is controlled by
- a) No. of Y-chromosome b) No. of X-chromosome
c) Ratio between number of X-chromosome and the set of autosome d) Sets of autosome
91. The process involved in the RNA formation on the DNA template
- a) Translation b) Transduction c) Transcription d) Transformation
92. DNA elements, which can switch their position, are called_____.
- a) exons b) introns c) cistrons d) transposons
93. In India, the organisation responsible for assessing the safety of introducing genetically modified organisms for public use is_____
- a) Research Committee on Genetic Manipulation (RCGM)
b) Council for Scientific and Industrial Research (CSIR)
c) Indian Council of Medical Research (ICMR)
d) Genetic Engineering Approval Committee (GEAC)
94. Semi-conservative replication of DNA was first demonstrated in_____
- a) Escherichia coli b) Streptococcus pneumoniae c) Salmonella typhimurium
d) Drosophila melanogaster
95. Basis of DNA fingerprinting is:
- a) Relative proportion of purines and pyrimidines
b) Relative difference in DNA occurrence in blood skin and saliva
c) Relative amounts of DNA in ridges and grooves of fingerprints
d) Satellite DNA occurring as highly repeated short DNA segments
96. To initiate translation, the mRNA first binds to
- a) the smaller ribosomal sub-unit b) the larger ribosomal sub-unit c) the whole ribosome
d) no such specificity exists.

97. DNA as an acidic substance present in nucleus was first identified by in _____ 1869; he named it as ____.
- a) Meischer, nuclein b) Watson and Crick, DNA c) Chargaff, nuclein
d) Wilkins and Franklin, double helix
98. Repressible operon system is usually found in ____ (i) ____ pathways. The pathway's end product serves as a ____ (ii) ____ to activate the repressor, turn off enzyme synthesis and prevent overproduction of the end product of the pathway. Genes for this operon are usually switched ____ (iii) ____ and the repressor is synthesised in an ____ (iv) ____ form.
- a)
- | | | | |
|----------|-------------|-------|----------|
| (i) | (ii) | (iii) | (iv) |
| anabolic | corepressor | on | inactive |
- b)
- | | | | |
|----------|---------|-------|--------|
| (i) | (ii) | (iii) | (iv) |
| anabolic | inducer | off | active |
- c)
- | | | | |
|-----------|---------|-------|--------|
| (i) | (ii) | (iii) | (iv) |
| catabolic | inducer | off | active |
- d)
- | | | | |
|-----------|-------------|-------|----------|
| (i) | (ii) | (iii) | (iv) |
| catabolic | corepressor | on | inactive |
99. Which is the most common mechanism of genetic variation in the population of sexually reproducing organism?
- a) Chromosomal aberrations b) Genetic drift c) Recombination d) Transduction
100. In a dihybrid cross between AABB and aabb the ratio of AABB, AABb, aabb in F₂ generation is
- a) 9:3:3:1 b) 1:1:1:1 c) 1:2:2:1 d) 1:1:2:2
101. Which is not involved in protein synthesis?
- a) Transcription b) Initiation c) Elongation d) Termination
102. The year 2003 was celebrated as the 50th anniversary of discovery of
- a) transposons by Barbara Mc Clintock b) structure of DNA by Watson and Crick
c) Mendel's laws of inheritance d) biotechnology by Kary Mullis.
103. T.O. Diener discovered a _____
- a) free infectious DNA b) infectious protein c) bacteriophage d) free infectious RNA
104. Select the correct statement _____.
- a) Spliceosomes take part in translation
b) Punnett square was developed by a British scientist
c) Fran'tin Stahl coined the term 'linkage' d) Transduction was discovered by S. Altman.
105. A sequential expression of a set of human genes _____.
- a) messenger RNA b) DNA sequence c) ribosome d) transfer RNA
106. Triticale, the first man-made cereal crop, has been obtained by crossing wheat with-
- a) Rye b) Pearl millet c) Sugarcane d) Barley
107. Satellite DNA is classified on the basis of
- a) Length b) Base composition c) Number of repetitive units d) All of these
108. The first genetic material could be
- a) protein b) carbohydrates c) DNA d) RNA.
109. Which one of the following does not follow the central dogma of molecular biology?
- a) Pea b) Mucor c) Chlamydomonas d) HIV
110. Bond formed between two adjacent nucleotides of DNA strand is

- a) Glycosidic linkage b) Peptide bond c) Phosphodiester bond d) H-bond
111. Removal of RNA polymerase III from nucleoplasm will affect the synthesis of _____
a) tRNA b) hnRNA c) mRNA d) rRNA
112. Blotting technique involves transfer of DNA from
a) Membrane to gel b) Gel to membrane c) Sol to gel d) Gel to sol
113. Prokaryotic topoisomerase is
a) Helicase b) Primase c) DNA polymerase d) DNA gyrase
114. Transformation experiment was first performed on which bacteria?
a) E.coli b) *Diplococcus pneumoniae* c) *Salmonella* d) *Pasteurella pestis*
115. Protein synthesis in an animal cell takes place _____
a) only in the cytoplasm b) in the nucleolus as well as in the cytoplasm
c) in the cytoplasm as well as in mitochondria d) only on ribosomes attached to a nucleus
116. Sickle cell anemia is
a) Characterized by elongated sickle like RBCs with a nucleus
b) An autosomal linked dominant trait
c) Caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin
d) Caused by a change in a single base pair of DNA
117. Regulatory proteins are the accessory proteins that interact with RNA polymerase and affect its role in transcription. Which of the following statements is correct about regulatory protein?
a) They only increase expression. b) They only decrease expression.
c) They interact with RNA polymerase but do not affect the expression.
d) They can act both as activators and as repressors.
118. The semi-conservative nature of DNA replication was established by Meselson and Stahl in their classic experiment with bacteria. They grew bacteria in N^{15} - NH_4Cl containing medium, washed and then incubated in fresh medium with N^{14} - containing compounds and allowed to grow for three generations. CsCl density gradient centrifugation of isolated DNA established the nature of semiconservative DNA replication. The pictorial representation below shows the position of differentially labeled DNA in CsCl density gradient.

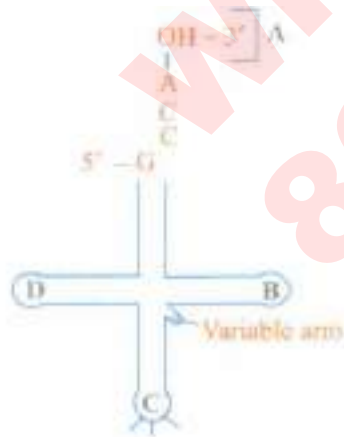


Had the DNA replication been conservative, what would have been the pattern?



119. AGGTATCGCAT is sequence from the coding strand of a gene. What will be the corresponding sequence of the transcribed mRNA?
a) ACCUAUGCCU b) UGTUTCGCAT c) UGTUTCGCAT d) UCCAUAGCGU

120. Human genome consists of approximately
 a) 3×10^9 bp b) 6×10^9 bp c) 20,000 - 25,000 bp d) 2.2×10^4 bp.
121. Because most of the amino acids are represented by more than one codon, the genetic code is _____
 a) overlapping b) wobbling c) degenerate d) generate
122. The differences between mRNA and tRNA are that ribosome.
 (i) mRNA has more elaborated 3-dimensional structure due to extensive base-pairing
 (ii) tRNA has more elaborated 3-dimensional structure due to extensive base-pairing
 (iii) tRNA is usually smaller than mRNA
 (iv) mRNA bears anticodon but tRNA has codons.
 a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) (i),(ii),(iii) and (iv)
123. Which statement is incorrect for lac operon?
 a) Repressor protein is the product of i-gene b) β -galactosidase is synthesized by lac Y
 c) Repressor binds operator gene d) Lactose acts as inducer
124. If one strand of DNA has the nitrogenous base sequence ATCTG what would be the complementary RNA strand sequence _____
 a) TTAGIT b) UAGAC c) AACTG d) ATCGU
125. Which of the following bond is not related to nucleic acid:
 a) H-bond b) Ester bond c) Glycosidic bond d) Peptide bond
126. Back bone in structure of DNA molecule is made up of-
 a) Pentose Sugar and phosphate b) Hexose sugar and phosphate
 c) Purine and pyrimidine d) Sugar and phosphate
127. Identify the labels A, B, C and D in the given structure of tRNA and select the correct option.



a)

A	B	C	D
Anticodon loop	TΨC loop	AA binding site	DHU loop

b)

A	B	C	D
AA binding site	TΨC loop	Anticodon loop	DHU loop

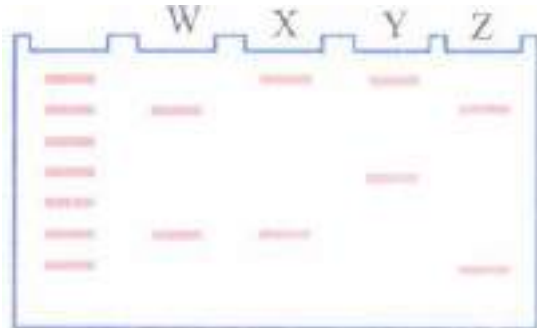
c)

A	B	C	D
AA binding site	DHU loop	Anticodon loop	TΨC loop

d)

A	B	C	D
AA binding site	DHU loop	TΨC loop	Anticodon loop

128. The DNA fingerprinting analysis of four family members is shown below.



Study the band pattern obtained and assign each family member to W, X, Y and Z. Choose the correct option.

- a) W - father X - mother Y - child Z - paternal uncle
- b) W - child X - father Y - mother Z - maternal uncle
- c) W - father X - child Y - mother Z - paternal uncle
- d) W - child X - father Y - maternal uncle Z - mother

129. A nucleotide is formed of _____

- a) purine, pyrimidine and phosphate
- b) purine, sugar and phosphate
- c) nitrogen base, sugar and phosphate
- d) pyrimidine, sugar and phosphate

130. **Assertion :** The sugar phosphate backbone of two chains in DNA double helix show anti-parallel polarity.

Reason: The phosphodiester bonds in one strand go from a 3' carbon of one nucleotide to a 5' carbon of adjacent nucleotide, whereas those in complementary strand go vice versa.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false

131. Given diagram represents the components of a transcription unit. Select the correct answer regarding it.



a)

A	B	C	D
Terminator	Promoter	Template strand	Coding strand

b)

A	B	C	D
Promoter	Terminator	Coding strand	Template strand

c)

A	B	C	D
Promoter	Terminator	Template strand	Coding strand

d)

A	B	C	D
Terminator	Promoter	Coding strand	Template strand

132. In negative operon _____
 a) co-repressor binds with repressor b) co-repressor does not bind with repressor
 c) co-repressor binds with inducer d) CAMP have negative effect on lac operon
133. The enzyme which has polymerising activity in 5'→3' direction but exonuclease activity in 3'→5' direction only is
 a) DNA polymerase III b) DNA polymerase II c) DNA polymerase I d) Both (1) & (2)
134. Male cat is either black or orange because of
 a) Hemizygous-X b) Heterozygous-x c) Heterozygous-y d) Hemizygous-Y
135. Wilkins X- ray diffraction showed the diameter the DNA helix is-
 a) 10Å b) 20Å c) 30Å d) 40Å
136. Which of the following nitrogen base is not found in DNA-
 a) Thymine b) Cytosine c) Guanine d) Uracil
137. If 120 Plants are produced on crossing pure red and pure white flowered pea plants, than the ratio of off springs will be
 a) 90 Red : 30 White b) 30 Red : 90 White c) 60 Red : 60 White d) All Red
138. Functioning of structural genes is controlled by
 a) Operator b) Promoter c) Ligase d) Regulator gene
139. A and B genes are linked, what shall be genotype of progeny in a cross between AB/ab and aabb:
 a) AAbb and aabb b) AaBb and aabb c) AABB and aabb d) None
140. During transcription, RNA polymerase holoenzyme binds to a gene promoter and assumes a saddle - like structure, what is it's DNA-binding sequence?
 a) AATT b) CACC c) TATA d) TTAA
141. In most of the plant viruses genetic material is
 a) ssDNA b) ssRNA c) dsRNA d) ssRNA + ssDNA
142. During transcription, the DNA site at which RNA polymerase binds is called _____.
 a) enhancer b) Promoter c) regulator d) receptor
143. What occurs in point mutation?
 a) Change in single base pair in DNA b) Change in single base pair in RNA
 c) Change in double base pair in DNA d) Change in double base pair in RNA
144. DNA replication is_____
 a) conservative and discontinuous b) semi-conservative and semidiscontinuous
 c) semi-conservative and discontinuous d) conservative
145. Which are the commonly used vectors for human genome sequencing?

- a) BAC and YAC b) Expression vectors c) T-DNA d) T/Acloning vectors
146. In a DNA percentage of thymine is 20% then what will be the percentage of guanine?
a) 20% b) 40% c) 30% d) 60%
147. Reverse transcriptase is _____
a) RNA dependent RNA polymerase b) DNA dependent RNA polymerase
c) DNA dependent DNA polymerase d) RNA dependent DNA polymerase
148. A complex of ribosomes attached to a single strand of RNA is known
a) Okazaki fragment b) polysome c) Polymer d) Polypeptide
149. Match column I with column II and select the correct option from the given codes.
- | | Column I | | Column II |
|----|----------|-------|---------------|
| A. | UUU | (i) | Serine |
| B. | GGG | (ii) | Methionine |
| C. | UCU | (iii) | Phenylalanine |
| D. | CCC | (iv) | Glycine |
| E. | AUG | (v) | Proline |
- a) A-(iii), B-(iv), C-(i), D-(v). E-(ii) b) A-(iii), B-(i), C(iv), D-(v). E-(ii)
c) A-(iii), B-(iv), C-(v), D-(i), E-(ii) d) A-(ii), B-(iv), C-(i), D-(v), E-(iii)
150. Given below is a sample of a portion of DNA strand. What is so special shown in it?
s'-GAAITC-3'
3'-CTTAAG-5"
a) Replication completed b) Deletion mutation c) Start codon at the 5' end
d) Palindromic sequence of base pairs
151. PCR and Restriction Fragment Length Polymorphism are the methods for
a) DNA sequencing b) Genetic fingerprinting c) Study of enzymes
d) Genetic transformation
152. Haemophilic gene does not transfer from:
a) Haemophilic father to son b) Haemophilic mother to son
c) Haemophilic father to daughter d) Haemophilic mother to son & daughter
153. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?
a) X phage b) 77 -plasmid c) Retrovirus d) pBR 322
154. The basis for DNA fingerprinting is _____
a) occurrence of Restriction Fragment Length Polymorphism(RFLP)
b) phenotypic differences between individuals c) availability of cloned DNA
d) knowledge of human karyotype
155. During expression of an operon, RNA polymerase binds to
a) structural gene b) regulator gene c) operator d) promoter.
156. In a DNA strand the nucleotides are linked together by
a) glycosidic bonds b) phosphodiester bonds c) peptide bonds d) hydrogen bonds.
157. In split genes, the coding sequence are called _____
a) introns b) operons c) exons d) cistrons

158. The linkage map of X-chromosome of fruitfly 66units, with yellow body gene (y) at one end bobbed hair (b) gene at the other end. recombination frequency between these two get (y and b) should be:
a) 60% b) >50% c) $\leq 50\%$ d) 100%
159. Some amino acids are coded by more than one codon, hence the genetic code is:
a) overlapping b) degenerate c) wobbled d) unambiguous.
160. Select the incorrect statement from the following
a) Baldness is a sex- limited trait
b) Linkage is an exception to the principle of independent assortment in heredity
c) Galactosemia is an inborn error of metabolism
d) Small population size results in random genetic drift in a population
161. Multiplication of DNA is called
a) Transcription b) Replication c) Translation d) Transduction
162. The genotype of a plant showing the dominant phenotype and can be determined by
a) Pedigree analysis b) Back Cross c) Test cross d) Dihybrid cross
163. In his classic experiments on pea plants, Mendel did not use:
a) Flower position b) Seed colour c) Pod length d) Seed shape
164. Unidirectional flow of information is called central dogma, given by
a) F.H.C. Crick b) Temin c) Baltimore d) Dulbecco
165. Which enzymes will be produced in a cell in which there is a nonsense mutation in the lac Y gene?
a) Lactose permease b) Transacetylase c) Lactose permease and transacetylase
d) β - galactosidase
166. On which plant Mendel had carried out his investigations
a) Garden-pea b) Wild pea c) Cow-pea d) Pigeon pea
167. Which RNA carries the amino acids from the amino acid pool to mRNA during protein synthesis?
a) rRNA b) mRNA c) tRNA d) hnRNA
168. An enzyme that joins the ends of two strands of nucleic acid is a ____
a) polymerase b) synthetase c) helicase d) ligase
169. Select the correct option that correctly fill the blanks i - iv.
I. less than ____ (i) ____ of genome represents structural genes that code for proteins.
II. Chemical substance that binds with repressor and convert it into a non-DNA binding state is ____ (ii) ____
III. In prokaryotes, during replication RNA primer is removed by ____ (iii) ____ whereas in eukaryotes it is removed by ____ (iv) ____.

a)

(i)	(ii)	(iii)	(iv)
5%	regulator	DNA polymerase II	DNA polymerase- β

b)

(i)	(ii)	(iii)	(iv)
10%	regulator	DNA polymerase I	DNA polymerase- α

c)

(i)	(ii)	(iii)	(iv)
2%	inducer	DNA polymerase I	DNA polymerase- β

d)

(i)	(ii)	(iii)	(iv)
50%	inducer	DNA polymerase II	DNA polymerase- α

170. Transforming principle explains

- a) Certain rules for growth culture of bacteria b) Ingredients of culture medium
c) Chemical substance released by S type d) Chemical substance released by R type

171. Due to discovery of which of the following in 1980 the evolution was termed as RNA world?

- a) mRNA, tRNA, rRNA synthesise proteins b) In some virus RNA is genetic material
c) RNA have enzymatic Property d) RNA is not found in all cells

172. DNA fingerprinting refers to

- a) Techniques used for identification of fingerprints of individuals
b) Molecular analysis of profiles of DNA samples
c) Analysis of DNA samples using imprinting devices
d) Techniques used for molecular analysis of different specimens of DNA

173. t-RNA attaches, amino acid at its:

- a) 3' end b) 5' end c) Anticodon d) Loop

174. Select the incorrectly matched pair:

- a) Initiation codons - AUG, GUG b) Stop codons - UAA, UAG, UGA c) Methionine - AUG
d) Anticodons - mRNA

175. Match the following genes of the Lac operon with their respective products:

- (a) i gene - (i) $\beta\beta$ — galactosidase
(b) z gene - (ii) Permease
(c) a gene - (iii) Repressor
(d) y gene - (iv) Transacetylase

Select the correct option.

- a) (iii) (i) (ii) (iv) b) (iii) (i) (iv) (ii) c) (iii) (iv) (i) (ii) d) (i) (iii) (ii) (iv)

176. Which of the following phenomena was experimentally proved by Meselson and Stahl?

- a) Transformation b) Transduction c) Semi-conservative DNA replication
d) Central dogma

177. A gene showing codominance has:

- a) both alleles independently expressed in the heterozygote
b) one allele dominant on the other c) alleles tightly linked on the same chromosome
d) alleles that are recessive to each other

178. Messenger RNA is produced in

- a) Nucleus b) Golgi apparatus c) Endoplasmic reticulum d) Ribosomes

179. Watson and Crick (1953) proposed DNA double helix model and won the Nobel Prize; their model of DNA was based on
- (i) X-ray diffraction studies of DNA done by Wilkins and Franklin
 - (ii) Chargaff's base equivalence rule
 - (iii) Griffith's transformation experiment
 - (iv) Meselson and Stahl's experiment.
- a) (i), (ii) and (iv) b) (i) and (ii) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)
180. What is the inheritance of colour blindness of both parents having a normal vision but mother has a recessive gene for colour blindness
- a)

Son	Daughter
50%	Nil
- b)

Son	Daughter
100%	Nil
- c)

Son	Daughter
Nil	100%
- d)

Son	Daughter
Nil	Nil
181. The three codons which result in the termination of polypeptide chain synthesis are
- a) UAA, UAG, GUA b) UAA, UAG, UGA c) UAA, UGA, UUA d) UGU, UAG, UGA.
182. The mechanism that causes a gene to move from one linkage group to another is called
- a) Translocation b) Crossing-over c) Inversion d) Duplication
183. Which one of the following is not a part of a transcription unit in DNA?
- a) The inducer b) A terminator c) A promoter d) The structural gene
184. **Assertion:** When the DNA sequences of two people are cut using the same restriction enzyme, the length and number of fragments obtained are different for both.
Reason: DNA sequence is arranged tandemly in many copy numbers which varies from chromosome to chromosome in an individual, showing high degree of polymorphism.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
185. An immature stop codon leads to :
- a) Mutation b) Non-sense mutation c) Variation d) Intron
186. Find out the wrong statement about heterochromatin.
- a) It is densely packed b) It stains dark. c) It is transcriptionally active
d) It is late replicating.
187. Both deoxyribose and ribose belong to a class of sugars called
- a) trioses b) hexoses c) pentoses d) polysaccharides.
188. During translation, activated amino acids get linked to tRNA. This process is commonly called as
- a) charging of tRNA b) discharging of tRNA c) aminoacylation of tRNA
d) both (a) and (c).
189. Long lived RNA is:
- a) rRNA b) mRNA c) tRNA d) hnRNA
190. Which one of the following conditions of zygotic cell would lead to the birth of a normal human female child?

- a) One X and one Y chromosome b) Two X chromosome c) Two X chromosome
d) Only one X chromosome
191. Regulation of gene expression occurs at the level of:
a) transcription b) processing/splicing c) translation d) all of these.
192. During replication of a bacterial chromosome DNA synthesis starts from a replication origin site and _____
a) RNA primers are involved b) is facilitated by telomerase
c) moves in one direction of the site d) moves in bi-directional way
193. A single recessive trait which can express its effect should occur on
a) Any autosome b) Any-chromosome c) X-chromosome of female
d) X-chromosome of male
194. Father of DNA finger printing is
a) Alec Jeffreys b) Lalji Singh c) V.K. Kashyap d) E.M. Southern
195. The number of base substitution possible in amino acid codons is _____
a) 261 b) 264 c) 535 d) 549
196. Taylor conducted the experiments to prove semiconservative mode of chromosome replication on :
a) Vicia aba b) Drosophila melanogaster c) E. coli d) Vinca rosea
197. Which of the following may be true for RNA
a) $A = U$ $G = C$ b) $A \neq U$ $G \neq C$ c) $A = U = G = C$ d) Purines = Pyrimidines
198. Amino acids which are specified by single codons are:
a) phenylalanine and arginine b) tryptophan and methionine c) valine and proline
d) methionine and arginine
199. Which of the following pairs is incorrectly matched?
a) Purines - Adenine and Guanine b) Pyrimidines - Cytosine and Uracil
c) Nucleosides - Adenosine and Thymidine d) DNA - Basic biomolecule
200. The sequence of structural genes in lac operon is:
a) Lac A, Lac Y, Lac Z b) Lac A, Lac Z, Lac Y c) Lac Y, Lac Z, Lac A
d) Lac Z, Lac Y, Lac A
201. The translation termination triplet is _____
a) UAU b) UAA c) UAC d) UGC
202. Haploids are more suitable for mutation studies than the diploids. This is because:
a) haploids are more abundant in nature than diploids
b) All mutations, whether dominant or recessive are expressed in haploids
c) Haploids are reproductively more stable than diploids
d) Mutagens penetrate in haploids more effectively than in diploids
203. DNA is a polymer of nucleotides which are linked to each other by 3' -5' phosphodiester bond. To prevent polymerisation of nucleotides, which of the following modifications would you choose?

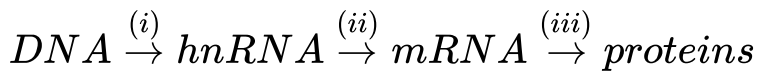
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- a) Replace purines with pyrimidines. b) Remove/Replace 3' OH group in deoxyribose
c) Remove/Replace 2' OH group with some other group in deoxyribose d) Both (b) and (c).
204. RNA is the genetic material in
a) prokaryotes b) eukaryotes c) Tobacco Mosaic Virus (TMV) d) E. coli.
205. If there are 999 bases in an RNA that codes for a protein with 33 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered?
a) 1 b) 11 c) 33 d) 333
206. A human male produces sperms with the genotypes AB, Ab, aB and ab, in equal proportions. What is the corresponding genotype of this person:
a) AaBb b) AaBB c) AABb d) AABB
207. DNA precipitation out of a mixture of biomolecules can be achieved by treatment with _____
a) Chilled ethanol b) Methanol at room temperature c) Chilled chloroform
d) Isopropanol
208. The number of N-glycosidic linkage in ϕ 174 virus is
a) 5386 b) 5385 c) 48502 d) 10772
209. Commonly used vectors for human genome sequencing are
a) T-DNA b) BAC and YAC c) Expression Vectors d) T/A Cloning Vectors
210. Sex-linked disorders are generally
a) Lethal b) Recessive c) Dominant d) Not inherited
211. Which one is not applicable to RNA?
a) Complementary base pairing b) 5'phosphoryl and 3' hydroxyl ends
c) Heterocyclic nitrogenous bases d) Chargaff's rule
212. Amino acid acceptor end of tRNA lies at
a) 5' end b) 3' end c) T Ψ C loop d) DHU loop.
213. There will be no Barr body in female suffering from:
a) Turner syndrome b) Klinefelter syndrome c) Down syndrome d) Haemophilia
214. Genes do not occur in pairs in
a) Zygote b) Somatic cell c) Endosperm cell d) Gametes
215. Which chromosome set is found in male hopper
a) 2A+XY b) 2A+XO c) 2A+YY d) 2A+XX
216. The methodologies used for the sequencing of whole set of genome containing all the coding and non-coding sequence is
a) ESTs b) SNPs c) Sequence annotation d) DNA profiling
217. During DNA replication, the strands separate by _____
a) DNA polymerase b) topoisomerase c) unwindase/helicase d) gyrase
218. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by:
a) pq b) q^2 c) P^2 d) 2pq
219. Expressed Sequence Tags (ESTs) refers to _____

- a) Polypeptide expression b) Divergence c) Novel DNA sequences
d) Genes expressed as RNA
220. If two persons with 'AB' blood group marry and have sufficiently large number of children, these children could be classified as 'A' blood group: 'AB' blood group 'B' blood group in 1:2:1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of:
a) Complete dominance b) Codominance c) Incomplete dominance
d) Partial dominance
221. Which of the following is not a stop codon?
a) UGA b) UAG c) AUG d) UAA
222. **Assertion :** Template or antisense strand, having 3' ~ 5' polarity takes part in transcription.
Reason: Non-template or sense strand, having 5' ~ 3' polarity, does not take part in transcription.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
223. The first amino acid in any polypeptide chain of prokaryote is always
a) Formylated methionine b) Formylated arginine c) Lysine d) Methionine
224. One turn of the helix in a B-form DNA is approximately
a) 20nm b) 0.34nm c) 3.4nm d) 2nm
225. A colourblind daughter is born when
a) Father is colourblind, mother is normal b) Mother is colourblind, father is normal
c) Mother is carrier, father is normal d) Mother is carrier, father is colourblind
226. Nucleotide arrangement in DNA can be seen by____
a) X-ray crystallography b) electron microscope c) ultracentrifuge d) light microscope
227. Antiparallel strand in DNA is due to
a) Disulphide linkage b) Hydrogen bond c) Phosphodiester bond d) Ionic bond
228. In a DNA molecule, the phosphate group is attached to carbon _____ of the sugar residue of its own nucleotide and carbon _____ of the sugar residue of the next nucleotide by _____ bonds.
a) 5', 3', phosphodiester b) 3', 5', phosphodiester c) 5', 3', glycosidic d) 3', 5', glycosidic
229. The amino acid attaches to the tRNA at its
a) 5' - end b) 3' - end c) anticodon site d) DHU loop.
230. Which one of the following makes use of RNA as a template to synthesize DNA?
a) DNA polymerase b) RNA polymerase c) Reverse transcriptase
d) DNA dependent RNA polymerase
231. Estimated number of genes in human beings is
a) 3,000 b) 80,000 c) 20,500 d) 3×10^9
232. Which one of the following is a case of wrong matching?

- a) Micropropagation-In vitro production of plants in large numbers
 - b) Callus - Unorganised mass of cells produced in tissue culture
 - c) Somatic hybridization - Fusion of two diverse cells
 - d) Vector DNA - Site for t-RNA synthesis
233. Which one among the following was the first genetic material?
a) DNA b) RNA c) Protein d) Nuclein
234. Which form of RNA has a structure resembling clover leaf?
a) rRNA b) hn RNA c) mRNA d) tRNA
235. Cap nucleotides at 5' of mRNA consists of
a) m⁷G b) m⁵C c) Poly A d) CCA
236. When two unrelated individuals or lines are crossed, the performance of F1 hybrid is often superior to both its parents. This phenomenon is called:
a) Heterosis b) Transformation c) Splicing d) Metamorphosis
237. Sickle cell anemia results from a single base substitution in a gene, thus it is an example of
a) point mutation b) frame-shift mutation c) silent mutation d) both (a) and (b).
238. The incorrect statement with regard to Haemophilia is
a) A single protein involved in the clotting of blood is affected b) It is a sex-linked disease
c) It is a recessive disease d) It is a dominant disease
239. Refer to the given steps of DNA replication.
(i) Exposure of DNA strands
(ii) Synthesis of RNA primer
(iii) Activation of deoxyribonucleotides
(iv) Chain formation
(v) Base pairing
(vi) Proof reading and DNA repair
(vii) DNA polymerase attaches at Oti site
Select the correct sequence of DNA replication.
a) (vii) → (iii) → (i) → (ii) → (v) → (iv) → (vi)
b) (iii) → (i) → (vii) → (ii) → (v) → (iv) → (vi)
c) (vii) → (i) → (iii) → (ii) → (v) → (iv) → (vi)
d) (i) → (iii) → (ii) → (vii) → (v) → (iv) → (vi)
240. In some viruses, DNA is synthesised by using RNA as template. Such a DNA is called
a) A-DNA b) B-DNA c) cDNA d) rDNA.
241. Satellite DNA is useful tool in
a) Forensic science b) Genetic engineering c) Organ transplantation
d) Sex determination
242. The transforming principle of Pneumococcus as found out by Avery, MacLeod and McCarty was ____
a) mRNA b) DNA c) protein d) polysaccharide

243. Refer to the given sequence of steps and select the correct option.



a)

(i)	(ii)	(iii)
Replication	Transcription	Translation

b)

(i)	(ii)	(iii)
Replication	Processing	Translation

c)

(i)	(ii)	(iii)
Transcription	Splicing	Translation

d)

(i)	(ii)	(iii)
Transcription	Replication	Translation

244. What is not true for genetic code?

- a) It is nearly universal b) It is degenerate c) It is unambiguous
d) A codon in mRNA is read in a non contiguous fashion

245. Severo Ochoa enzyme is

- a) DNA polymerase b) Guanyl transferase c) Peptidyl transferase
d) Polynucleotide phosphorylase

246. Read the following four statement (A-D):

- (A) In transcription, adenosine pairs with uracil.
(B) Regulation of lac operon by repressor is referred to as positive regulation.
(C) The human genome has approximately 50000 genes.
(D) Haemophilia is a sex-linked recessive disease.

How many of the above statements are right?

- a) Four b) One c) Two d) Three

247. Which of the following is a stop codon

- a) AUG,GUG,UUU b) UGA,UAG,UAA c) UUU,UAC,CUC d) CUC,UAC,UAA

248. Multiple alleles are present:

- a) At different loci on the same chromosome b) At the same locus of the chromosome
c) On non-sister chromatids d) On different chromosomes

249. The wild type E. coli cells are growing in normal medium with glucose. They are transferred to a medium containing only lactose as sugar. Which of the following changes takes place?

- a) The lac operon is repressed b) All operons are induced c) The lac operon is induced
d) E. coli cells stop dividing

250. Radioactive element used to label DNA of bacteriophage In Hershey and Chase experiment was

- a) S³⁵ b) P³² c) N¹⁵ d) C¹⁴

251. The experimental proof for semi-conservative replication of DNA was first shown in a:

- a) Plant b) Bacterium c) Fungus d) Virus

252. A DNA template plus primer with the structure



(where P = a phosphate group) is placed in an in vitro DNA synthesis system containing Mg²⁺,

an excess of the four deoxyribonucleoside triphosphates, etc. and a mutant form of *E. coli* DNA polymerase I that lacks 5' ~ 3' exonuclease activity. The 5' ~ 3' polymerase and 3' ~ 5' exonuclease activities of this aberrant enzyme are identical to those of normal *E. coli* DNA polymerase I. It simply has no 5' ~ 3' exonuclease activity. What will be the structure of the final product?

- a) $3' \text{ (P) } - \text{TGCGAATTAGCGACAT- (P) } 5'$
 $5' \text{ (P) } - \text{ATCGGTACGACGCTTAATCGCTGTA-OH } 3'$
- b) $3' \text{ (P) } - \text{TGCGAATTGGCGACAT- (P) } 5'$
 $5' \text{ (P) } - \text{ATCGGTACGACGCTTAACCGCTGTA-OH } 3'$
- c) $3' \text{ HO- } \text{TGCGAATTAGCGACAT- (P) } 5'$
 $5' - \text{ATCGGTACGACGCTTAATCGCTGTA- (P) } 3'$
- d) $3' \text{ (P) } - \text{TGCGAATTAGCGACAT- (P) } 5'$
 $5' \text{ (P) } - \text{ACGCTTAATCGCTGTA-OH } 3'$

253. The term "linkage" was coined by:

- a) W.Sutton b) T.H.Morgan c) T.Boveri d) G.Mendel

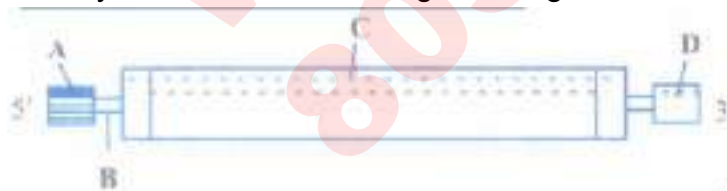
254. A molecule that can act as a genetic material must fulfill the traits given below, except:

- a) It should be able to generate its replica
 b) It should be unstable structurally and chemically
 c) It should provide the scope for slow changes that are required for evolution
 d) It should be able to express itself in the form of Mendelian characters

255. What would happen if in a gene encoding a polypeptide of 50 amino acids, 25th codon (UAU) is mutated to UAA?

- a) A polypeptide of 24 amino acids will be formed.
 b) Two polypeptides of 24 and 25 amino acids will be formed.
 c) A polypeptide of 49 amino acids will be formed.
 d) A polypeptide of 25 amino acids will be formed.

256. Identify A, B, C and D in the given diagram of mRNA.



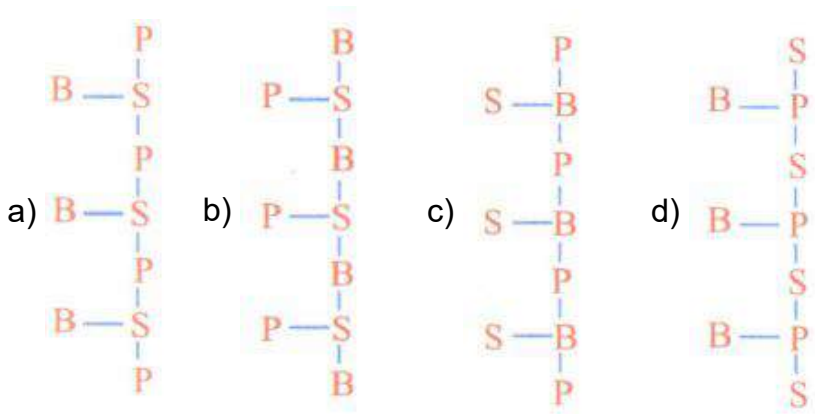
- a)
- | A | B | C | D |
|----------------|------------------|-------------------|------------|
| Methylated cap | Initiation codon | Termination codon | PolyA tail |
- b)
- | A | B | C | D |
|------------|-------------------|------------------|----------------|
| PolyA tail | Termination codon | Initiation codon | Methylated cap |
- c)
- | A | B | C | D |
|----------------|-------------------|---------------|------------|
| Methylated cap | Non-coding region | coding region | PolyA tail |
- d)
- | A | B | C | D |
|----------------|---------------|-------------------|------------|
| Methylated cap | coding region | Non-coding region | PolyA tail |

257. Alleles are

- a) true breeding homozygotes b) different molecular forms of a gene c) heterozygotes
 d) different phenotype

258. Which of the following is called adaptor molecule-

- a) DNA b) m-RNA c) t-RNA d) RNA
259. Which one of the following is a wrong statement regarding mutations?
- a) UV and Gamma rays are mutagens
 - b) Change in a single base pair of DNA does not cause mutation
 - c) Deletion and insertion of base pairs cause frameshift mutations
 - d) Cancer cells commonly show chromosomal aberrations
260. Name the enzyme that facilitates opening of DNA helix during transcription_____ .
- a) DNA polymerase b) RNA polymerase c) DNA ligase d) DNA helicase
261. Find incorrect match.
- a) RNA polymerase - Attach to UTR b) ρ (rho) factor - Termination
 - c) Core enzyme - $\alpha_2\beta\beta'\omega$ d) Promoter site - Sigma factor
262. Protein helping in opening of DNA double helix in front of replications fork is_____
- a) DNA gyrase b) DNA polymerase-I c) DNA ligase d) topoisomeras
263. The human chromosome with the highest and least number of genes in them are respectively
- a) chromosome 21 and Y b) chromosome 1 and X c) chromosome 1 and Y
 - d) chromosome X and Y.
264. If there are 10,000 base pairs in DNA, then its length
- a) 340nm b) 3400nm c) 34000nm d) 340000nm
265. Kornberg enzyme is known as
- a) DNA polymerase I b) DNA polymerase II c) DNA polymerase III d) RNA polymerase
266. The codons causing chain termination are_____ .
- a) TAG, TAA, TGA b) GAT, AAT, AGT c) AGT, TAG, UGA d) UAA, UAG, UGA
267. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow catyledon (YY) was dominant over green catyledon (yy) was dominant over green catyledon (yy). What are the expected phenotypes in the F₂ generation of the cross R₂YY x r₂yy?
- a) Only round seeds with green cotyledons b) Only wrinkled seeds with yellow cotyledons
 - c) Only wrinkled seeds with greencotyledons
 - d) Round seeds with yellow cotyledons, and wrinkled seeds with yellow cotyledons
268. Phenotype of an organism is the result of-
- a) Mutations and linkages b) Cytoplasmic effects and nutrition
 - c) Environmental changes and sexual dimorphism
 - d) Genotype and environment interaction
269. Which of the following shows the correct positions of the phosphate (P), sugar (S) and base (B) molecules in the given line diagrams representing the structure of DNA?



270. A parent having autosomal dominant disease then what will be the probability of diseased offspring (irrespective of sex of the child):
 a) 90% b) 10% c) 75% d) 100%
271. Types of RNA polymerase required in nucleus for RNA synthesis?
 a) 1 b) 2 c) 3 d) 4
272. If a double stranded DNA has 20% of cytosine, what will be the percentage of adenine in it?
 a) 20% b) 40% c) 30% d) 60%
273. Read the following statements and select the correct option.
 (i) Loosely packed and lightly stained region of chromatin are called as heterochromatin.
 (ii) Densely packed and dark stained region of chromatin are called as euchromatin.
 (iii) A typical nucleosome contains 200 bp of DNA helix.
 a) Statements (i) and (ii) are true, but statement (iii) is false.
 b) Statements (i) and (ii) are false, but statement (iii) is true.
 c) Statements (ii) and (iii) are true, but statement (i) is false. d) All the statements are true
274. In which of the following hn RNA is formed?
 a) Nostoc b) Rhizobium c) Chlamydomonas d) Mycoplasma
275. What is the first step in the Southern Blot technique
 a) Denaturation of DNA on the gel for hybridization with specific probe
 b) Production of a group of genetically identical cells
 c) Digestion of DNA by restriction enzyme
 d) Isolation of DNA from a nucleated cell such as the one from the scene of crime
276. Dihybrid plants from how many types of pollen grains
 a) One b) Two c) Four d) Eight
277. **Assertion** : Repetitive sequences make up very large portion of human genome.
Reason : Repetitive sequences do not have direct coding functions in the genome.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false
278. In one polynucleotide strand of a DNA molecule the ratio of $A + T / G + C$ is 0.3. What is the $A + G / T + C$ ratio of the entire DNA molecule?
 a) 0.3 b) 0.6 c) 1.2 d) 1
279. Match column I with column II and select the correct option from the given codes

	Column I		Column II
A.	F.Meischer	(i)	DNA double helix
B.	Griffith	(ii)	Nuclein
C.	Hershey and Chase	(iii)	S. pneumoniae
D.	Watson and Crick	(iv)	Bacteriophages
E.	Wilkins and Franklin	(v)	X-ray diffraction studies

- a) A-(ii), B-(iii), C-(iv), D-(i), E-(v) b) A-(v), B (iv), C-(iii), D-(i), E-(ii)
c) A-(i), B-(iii), C-(iv), D-(ii), E-(v) d) A-(i), B-(iv), C-(iii), D-(ii), E-(v)
280. If a colourblind women marries a normal visioned man, their sons will be-
a) All normal visioned b) One-half colourblind and one-half normal
c) Three-fourths colourblind and one- fourth normal d) All colourblind
281. Khorana first deciphered the triplet codons of _____
a) serine and isoleucine b) threonine and histidine c) tyrosine and tryptophan
d) phenylalanine and methionine
282. Which of the following statements regarding 'human genome' is incorrect?
a) Human genome consists of 3×10^9 bp and about 20,500 genes.
b) The average gene size is 3000 bp and dystrophin is the largest known human gene.
c) Chromosome 1 contains maximum (2968) number of genes and V-chromosome has the least (231) number of genes
d) Repeated (or repetitive) sequences are not present in human genome.
283. Which of the following is involved in translation:
a) DNA b) mRNA,tRNA,DNA c) mRNA,tRNA d) Only mRNA
284. If a colour-blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour-blind is :
a) 0.75 b) 1 c) 0 d) 0.5
285. Genetic code consists of _____
a) adenine and guanine b) cytosine and uracil c) cytosine and guanine
d) All of the above
286. Which of the following criteria should be fulfilled by a molecule to act as a genetic material?
(i) It should be able to replicate.
(ii) It should be structurally and chemically stable.
(iii) It should be able to undergo slow mutations.
(iv) It should be able to express itself in the form of 'Mendelian characters'.
a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)
287. **Assertion:** In Griffith's experiment, a mixture of heat- killed virulent bacteria R and live non-virulent bacteria S, lead to the death of mice.
Reason: 'Transforming principle' got transferred from heat-killed R strain to S strain and made it virulent.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

288. The Pneumococcus experiment proves that_____
- a) DNA is the genetic material
b) RNA sometime controls the production of DNA and proteins
c) bacteria undergo binary fission d) bacteria do not reproduce sexually
289. Choose the correct one w.r.t. DNA replication
- a) Fast b) Energy expensive c) Accurate d) More than one option is correct
290. Two allelic genes are located on:
- a) The same chromosome b) Two homologous chromosomes
c) Two-non-homologous chromosomes d) Any chromosomes
291. Bonding between deoxyribose' and base in purine nucleoside molecule is
- a) H-bonding b) Phosphoester linkage c) Glycosidic linkage d) Phosphodlester linkage
292. Gene and cistron words are sometimes used synonymously because_____
- a) one cistron contains many genes b) one gene contains many cistrons
c) one gene contains one cistron d) one gene contains no cistron
293. Match column I with column II and select the correct option from the given codes.
- | Column I | | Column II |
|-----------------------|-------|-----------------------------------|
| A. Griffith | (i) | Lac operon |
| B. Hershey and Chase | (ii) | Semi-conservative DNA replication |
| C. Meselson and Stahl | (iii) | Transduction |
| D. Jacob and Monod | (iv) | Transformation |
- a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(iii), B-(iv), C-(ii), D-(i) c) A-(iv), B-(ii), C-(iii), D-(i)
d) A-(ii), B-(i), C-(iii), D-(iv)
294. Genotype is
- a) Genetic composition of many organisms b) Genetic composition of plastids
c) Genetic composition of germ cells only d) Genetic composition of an individual
295. Experimental material used in transformation experiment was
- a) Bacillus b) Bacteriophage c) Diplococcus d) E.coil
296. In E. coli, the lac operon gets switched on when
- a) lactose is present and it binds to the repressor b) repressor binds to operator
c) RNA polymerase binds to the operator
d) lactose is present and it binds to RNA polymerase
297. In which direction m-RNA is synthesised on DNA template?
- a) 5'→3' b) 3'→5' c) Both (a) and (b) d) Any
298. Heterozygous tall plants were crossed with dwarf plants. what will be the ratio of dwarf plants in the progeny:
- a) 50% b) 25% c) 75% d) 100%
299. Genes are packaged into a bacterial chromosome by_____
- a) histones b) basic protein c) acidic protein d) actin
300. In DNA when AGCT occurs, their association is as per which of the following pair?

a) ACGT b) AGCT c) ATGC d) All of these

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Time : 1 Mins

MOLECULAR BASIS OF INHERITANCE 2 1

Marks : 952

- What is the first step in the Southern Blot technique
 - Denaturation of DNA on the gel for hybridization with specific probe
 - Production of a group of genetically identical cells
 - Digestion of DNA by restriction enzyme
 - Isolation of DNA from a nucleated cell such as the one from the scene of crime
- If both parents are carriers for thalassemia, which is an autosomal recessive disorder, what is the chance of pregnancy resulting in an affected child?
 - 100%
 - No chance
 - 50%
 - 25%
- Biological name of wheat is:
 - Triticum aestivum
 - Triticum tritcale
 - Triticum sativum
 - Triticum tuberosum
- Blotting technique involves transfer of DNA from
 - Membrane to gel
 - Gel to membrane
 - Sol to gel
 - Gel to sol
- Which of the following cannot act as inducer?
 - Lactose
 - Galactose
 - Both (a) and (c)
 - Glucose
- Bond formed between two adjacent nucleotides of DNA strand is
 - Glycosidic linkage
 - Peptide bond
 - Phosphodiester bond
 - H-bond
- Chargaff's rule is given as:
 - Purines Pyrimidines
 - $A + U = G + C$
 - $A + U = G + C$
 - $A + T/G + C = \text{Const.}$
- The methodologies used for the sequencing of whole set of genome containing all the coding and non-coding sequence is
 - ESTs
 - SNPs
 - Sequence annotation
 - DNA profiling
- Which out of the following statements is incorrect?
 - Genetic code is ambiguous.
 - Genetic code is degenerate.
 - Genetic code is universal.
 - Genetic code is non-overlapping.
- Who amongst the following scientists had no contribution in the development of the double helix model for the structure of DNA?
 - Rosalind Franklin
 - Maurice Wilkins
 - Erwin Chargaff
 - Meselson and Stahl
- Linkage discovered in Drosophila by
 - Bateson
 - Morgan
 - Muller
 - Correns
- DNA differs from RNA in
 - Only Sugar
 - Nitrogen base only
 - Nitrogen base and sugar
 - None

13. The number of base substitution possible in amino acid codons is ____
 a) 261 b) 264 c) 535 d) 549
14. An immature stop codon leads to :
 a) Mutation b) Non-sense mutation c) Variation d) Intron
15. Transcription unit
 a) starts with TATA box b) starts with palindrome regions and ends with rho factor
 c) starts with promoter region and ends in terminator region d) starts with CAAT region.
16. Thymine is-
 a) 5-Methyl uracil b) 4-Methyl uracil c) 3-Methyl uracil d) 1-Methyl uracil
17. The amino acid attaches to the tRNA at its
 a) 5' - end b) 3' - end c) anticodon site d) DHU loop.
18. In cells of superfemale with 47 chromosomes (44+xxx) visible barr bodies are
 a) 1 b) 0 c) 2 d) 3
19. Which one is not applicable to RNA?
 a) Complementary base pairing b) 5'phosphoryl and 3' hydroxyl ends
 c) Heterocyclic nitrogenous bases d) Chargaff's rule
20. Match column I with column II and select the correct option from the given codes

	Column I		Column II
A.	F.Meischer	(i)	DNA double helix
B.	Griffith	(ii)	Nuclein
C.	Hershey and Chase	(iii)	S. pneumoniae
D.	Watson and Crick	(iv)	Bacteriophages
E.	Wilkins and Franklin	(v)	X-ray diffraction studies

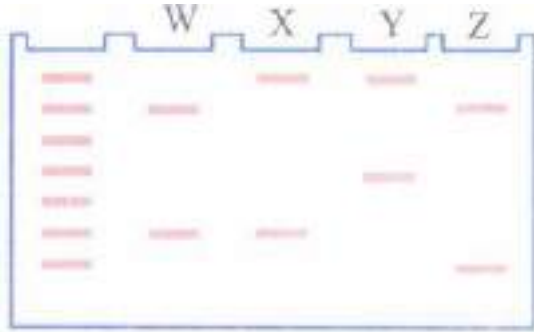
- a) A-(ii), B-(iii), C-(iv), D-(i), E-(v) b) A-(v), B (iv), C-(iii), D-(i), E-(ii)
 c) A-(i), B-(iii), C-(iv), D-(ii), E-(v) d) A-(i), B-(iv), C-(iii), D-(ii), E-(v)
21. Which of the following is a stop codon
 a) AUG,GUG,UUU b) UGA,UAG,UAA c) UUU,UAC,CUC d) CUC,UAC,UAA
22. DNA fragments generated by the restriction endonucleases in a chemical reaction can be separated by:
 a) Restriction mapping b) Centrifugation c) Polymerase chain reaction
 d) Electrophoresis
23. Read the sequence of nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain to answer the Q. nos. 65 and 66.

mRNA	AUG UUU AUG CCU GUU UCU UAA
Polypeptide	Met—Phe—Met—Pro—Val—Ser

Nucleotide sequence of the DNA strand from which this mRNA was transcribed is

- a) TAC AAA TAC GGA CAA AGA ATT b) AUG UUU AUG CCU GUU UCU UAA
 c) UAC AAA UAC GGA CAA AGA AUU d) ATG TTT ATG CCT GTT TCT TAA.

24. The DNA fingerprinting analysis of four family members is shown below.




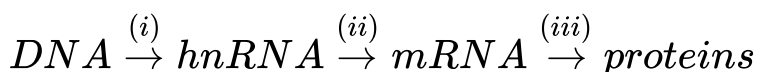
Study the band pattern obtained and assign each family member to W, X, Y and Z. Choose the correct option.

- a) W - father X - mother Y - child Z - paternal uncle
 - b) W - child X - father Y - mother Z - maternal uncle
 - c) W - father X - child Y - mother Z - paternal uncle
 - d) W - child X - father Y - maternal uncle Z - mother
25. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?
- a) X phage b) 77 -plasmid c) Retrovirus d) pBR 322
26. Biochemical characterisation of transforming principle was done by
- a) Hershey and chase b) Morgan c) Meischer d) Avery, MacLeod and McCarty
27. In eukaryotes, how many DNA polymerases are present?
- a) 3 b) 5 c) 4 d) 2
28. If the sequence of bases in one strand of DNA is ATGCATGCA, what would be the sequence of bases on complementary strand?
- a) ATGCATGCA b) AUGCAUGCA c) TACGTACGT d) UACGUACGU
29. Which is the most common mechanism of genetic variation in the population of sexually reproducing organism?
- a) Chromosomal aberrations b) Genetic drift c) Recombination d) Transduction
30. If the sequence of nitrogen bases of the coding strand of DNA in a transcription unit is: 5' - A T G A A T G - 3', the sequence of bases in its RNA transcript would be:
- a) 5' - A U G A A U G - 3' b) 5' - U A C U U A C - 3' c) 5' - C A U U C A U - 3' d) 5'-GUAAGUA-3'.
31. Which one of the following pairs of nitrogenous bases of nucleic acids, is wrongly matched with the category mentioned against it?
- a) Thymine, Uracil - Pyrimidines b) Uracil, Cytosine - Pyrimidines
 - c) Guanine, Adenine - Purines d) Adenine, Thymine - Purines
32. In the base sequence of one strand of DNA is GAT, TAG, CAT, GAC what shall be the sequence of its complementary strand:
- a) CAT, CTG, ATC, GTA b) GTA, ATC, CTG, GTA c) ATC, GTA, CTG, GTA
 - d) CTA, ATC, GTA, CTG
33. Because most of the amino acids are represented by more than one codon, the genetic code is_____
- a) overlapping b) wobbling c) degenerate d) generate

34. Select the two correct statements out of the four (a - d) given below about lac operon _____
(i) Glucose or galactose may bind with the repressor and inactivate it
(ii) In the absence of lactose the repressor binds with the operator region
(iii) The z-gene codes for pennease
(iv) This was elucidated by Francois Jacob and Jacque Monod
The correct statements are
a) (ii) and (iii) b) (i) and (iii) c) (ii) and (iv) d) (i) and (ii)
35. **Assertion:** Lac operon is a repressible operon.
Reason: The product of gene activity stops the activity of the said gene.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
36. The three codons which result in the termination of polypeptide chain synthesis are
a) UAA, UAG, GUA b) UAA, UAG, UGA c) UAA, UGA, UUA d) UGU, UAG, UGA.
37. Inheritance of skin colour in humans is an example of
a) chromosomal aberration b) point mutation c) polygenic inheritance d) codominance
38. Synthesis of DNA on RNA template was first observed in
a) Bacteria b) Plant c) Virus d) Both (1) & (2)
39. Radioactive element used to label DNA of bacteriophage In Hershey and Chase experiment was
a) S^{35} b) P^{32} c) N^{15} d) C^{14}
40. A DNA with unequal nitrogen bases would most probably be _____
a) single stranded b) double stranded c) triple stranded d) four stranded
41. During expression of an operon, RNA polymerase binds to
a) structural gene b) regulator gene c) operator d) promoter.
42. Select the correct statements out of the following.
(i) Both DNA and RNA are able to mutate.
(ii) RNA being unstable, mutates at a faster rate.
(iii) RNA shows catalytic properties.
(iv) Presence of uracil (U) at place of thymine (T) confers additional stability to RNA.
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iv) d) (i), (ii) and (iii)
43. The wild type E. coli cells are growing in normal medium with glucose. They are transferred to a medium containing only lactose as sugar. Which of the following changes takes place?
a) The lac operon is repressed b) All operons are induced c) The lac operon is induced
d) E. coli cells stop dividing
44. Experimental material in the study of DNA replication has been _____
a) Escherichia coli b) Neurospora crassa c) Pneumococcus
d) Drosophila melanogaster
45. Which one of the following is not applicable to RNA?
a) 5' phosphoryl and 3' hydroxy/ends b) Heterocyclic nitrogenous bases
c) Chargaff's rule d) Complementary base pairing
46. Which of the following phenomena was experimentally proved by Meselson and Stahl?

- a) Transformation b) Transduction c) Semi-conservative DNA replication
d) Central dogma
47. Which of the following is not a stop codon?
a) UGA b) UAG c) AUG d) UAA
48. Double helix model of DNA
a) Was given by Watson and Crick b) Suggests '3D' structure c) Was given for B-DNA
d) All of these
49. Suppose evolution on earth has occurred in such a way that there are 96 amino acids instead of 20. DNA has 12 different types of bases and DNA synthesis occur in the same way as today. The minimum number of bases per DNA condon would be
a) 12 b) 8 c) 2 d) 3
50. In a testcross involving F1 dihybrid flies, the parental-type offspring were produced than the recombinant-type offspring. This indicates:
a) The two genes are located on two different chromosomes
b) Chromosomes failed to separate during meiosis
c) The two genes are linked and present on the same chromosome
d) Both of the characters are controlled by more than one gene
51. To prove that DNA is the genetic material, which radioactive isotopes were used by Hershey and Chase (1952) in their experiments?
a) ^{35}S and ^{15}N b) ^{32}P and ^{35}S c) ^{32}P and ^{15}N d) ^{14}N and ^{15}N
52. The unequivocal proof of DNA as the genetic material came from studies on a
a) Virioid b) Bacterial virus c) Bacterium d) Fungus
53. Gametes of AaBb individual can be:
a) Aa, Bb b) AB, ab c) AB, ab, aB d) AB, Ab, aB, ab
54. Alleles are
a) true breeding homozygotes b) different molecular forms of a gene c) heterozygotes
d) different phenotype
55. DNA ligase is involved in
a) Formation of RNA primer b) Filling of gaps c) Joining of Okazaki fragments
d) Both (1) & (2)
56. The differences between mRNA and tRNA are that ribosome.
(i) mRNA has more elaborated 3-dimensional structure due to extensive base-pairing
(ii) tRNA has more elaborated 3-dimensional structure due to extensive base-pairing
(iii) tRNA is usually smaller than mRNA
(iv) mRNA bears anticodon but tRNA has codons.
a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) (i),(ii),(iii) and (iv)
57. How does steroid hormone influence the cellular activities?
a) Changing the permeability of the cell membrane
b) Binding to DNA and forming a genehormone complex

- c) Activating cyclic AMP located on the cell membrane
 d) Using aquaporin channels as second messenger
58. During protein synthesis, amino acid gets attached to tRNA with the help of
 a) mRNA b) Aminoacyl synthetase c) Ribosome d) rRNA
59. If a hybrid DNA molecule is allowed to replicate twice in normal culture medium, the percentage of hybrid DNA will be
 a) 50% b) 12.5% c) 25% d) 75%
60. The codons causing chain termination are _____.
 a) TAG, TAA, TGA b) GAT, AAT, AGT c) AGT, TAG, UGA d) UAA, UAG, UGA
61. How many linkage group are these in nuclear bacteria
 a) One b) Two c) Four d) None
62. Refer to the given mRNA segment
- 
- It can be translated completely into a polypeptide.
 Which of the following codons may correspond with A and B?
- a) A - AUG, GUG; B - UAA, UAG or UGA b) A - UAA, UGA; B - AUG, GUG or UAG
 c) A - AUG, UGA; B - GUG, UAA or UGA d) A - AUG, GAG; B - UAA, UUU or UGA
63. Semi-conservative replication of DNA was first demonstrated in_____
 a) Escherichia coli b) Streptococcus pneumoniae c) Salmonella typhimurium
 d) Drosophila melanogaster
64. In some viruses, DNA is synthesised by using RNA as template. Such a DNA is called
 a) A-DNA b) B-DNA c) cDNA d) rDNA.
65. What is the correct sequence of DNA finger printing?
 a- separation of desired DNA by gel electrophoresis
 b- Digestion by restriction endonuclease
 c- Isolation of DNA
 d- Hybridisation using labelled VNTR probe
 e- Southern blotting
 a) a → b → c → d → e b) b → d → e → a → c c) c → b → a → d → e d) c → d → a → e → d
66. Which of the following pairs is incorrectly matched?
 a) Purines - Adenine and Guanine b) Pyrimidines - Cytosine and Uracil
 c) Nucleosides - Adenosine and Thymidine d) DNA - Basic biomolecule
67. When two unrelated individuals or lines are crossed, the performance of F1 hybrid is often superior to both its parents. This phenomenon is called:
 a) Heterosis b) Transformation c) Splicing d) Metamorphosis
68. Refer to the given sequence of steps and select the correct option.



a)

(i)	(ii)	(iii)
Replication	Transcription	Translation

b)

(i)	(ii)	(iii)
Replication	Processing	Translation

c)

(i)	(ii)	(iii)
Transcription	Splicing	Translation

d)

(i)	(ii)	(iii)
Transcription	Replication	Translation

69. The RNA that picks up specific amino acid from amino acid pool in the cytoplasm to ribosome during protein synthesis is called _____

- a) mRNA b) tRNA c) rRNA d) RNA

70. Repressible operon system is usually found in____(i)____pathways. The pathway's end product serves as a____(ii)____to activate the repressor, turn off enzyme synthesis and prevent overproduction of the end product of the pathway. Genes for this operon are usually switched____(iii)____and the repressor is synthesised in an____(iv)____form.

a)

(i)	(ii)	(iii)	(iv)
anabolic	corepressor	on	inactive

b)

(i)	(ii)	(iii)	(iv)
anabolic	inducer	off	active

c)

(i)	(ii)	(iii)	(iv)
catabolic	inducer	off	active

d)

(i)	(ii)	(iii)	(iv)
catabolic	corepressor	on	inactive

71. Which of the following is not required for any of the techniques of DNA fingerprinting available at present?

- a) DNA-DNA hybridization b) Polymerase chain reaction c) Zinc finger analysis
d) Restriction enzymes

72. Reverse transcriptase using RNA, forms which of the following?

- a) Double stranded DNA b) Double stranded RNA c) DNA & RNA
d) Single stranded RNA

73. **Assertion** : Repetitive sequences make up very large portion of human genome.

Reason : Repetitive sequences do not have direct coding functions in the genome.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

74. If one strand of DNA has the nitrogenous base sequence ATCTG what would be the complementary RNA strand sequence _____

- a) TTAGIT b) UAGAC c) AACTG d) ATCGU

75. An organism uses 20 amino acids while its DNA is made up of 6 types of nitrogenous bases. What would be the minimum size of a codon?

- a) 6 b) 4 c) 3 d) 2

76. Which is incorrect for genetic code-

- (a) (i) The codon is triplet
(b) (ii) 64 codons code for amino acids

- (c) (iii) Genetic code is unambiguous
 (iv) Genetic code is nearly universal
 (d) (v) AUG has dual functions
 a) only ii b) ii & iii c) iii, iv + v d) All are correct

77. Fruit colour in squash is an example of

- a) Recessive epistasis b) Dominant epistasis c) Complementary genes
 d) Inhibitory genes

78. DNA template sequence of CTGATAGC is transcribed over mRNA as _____

- a) GUCTUTCG b) GACUAUCG c) GAUTATUG d) UACTATCU

79. Which of the following differences are incorrect between leading and lagging strands of DNA?

	Leading strand	Lagging strand
(i)	It does not require DNA ligase for its growth.	DNA ligase is required for joining Okazaki fragments.
(ii)	Formation of leading strand is slower.	Formation of lagging strand is quite rapid
(iii)	Its template opens in 5' → 3' direction.	Its template opens in 3' → 5' direction.
(iv)	Formation of leading strand begins immediately at the beginning of replication.	Formation of lagging strand begins a bit later than that of leading strand.

- a) (ii) and (iv) only b) (ii), (iii) and (iv) only c) (ii) and (iii) only d) (i), (ii) and (iii) only

80. A test cross of F1 flies + a/+b produced the following offspring

++/ab = 9
 ab/ab = 9
 +b/ab = 41
 a+/ab = 41

What will be distance between linked gene

- a) 82 cM b) 18 cM(cis) c) 20cM d) 18cM(trans)

81. The telomeres of eukaryotic chromosomes consist of short sequences of _____

- a) thymine rich repeats b) cytosine rich repeats c) adenine rich repeats
 d) guanine rich repeats

82. In E. coli, the lac operon gets switched on when

- a) lactose is present and it binds to the repressor b) repressor binds to operator
 c) RNA polymerase binds to the operator
 d) lactose is present and it binds to RNA polymerase

83. Gene regulation governing lactose operon of E.coli that involves the lac I gene product is _____ .

- a) Negative and inducible because repressor protein prevents transcription.
 b) Negative and repressible because repressor protein prevents transcription.
 c) Feedback inhibition because excess of β - galactosidase can switch off transcription.
 d) Positive and inducible because it can be induced by lactose

84. Linkage is a tendency of alleles of different genes to assort together in :
a) Meiosis b) Mitosis c) X-Y linkage d) Inversion
85. In a dihybrid cross between AABB and aabb the ratio of AABB, AABb, aabb in F_2 generation is
a) 9:3:3:1 b) 1:1:1:1 c) 1:2:2:1 d) 1:1:2:2
86. Nucleotide arrangement in DNA can be seen by____
a) X-ray crystallography b) electron microscope c) ultracentrifuge d) light microscope
87. Satellite DNA is classified on the basis of
a) Length b) Base composition c) Number of repetitive units d) All of these
88. Phenotype of an organism is the result of-
a) Mutations and linkages b) Cytoplasmic effects and nutrition
c) Environmental changes and sexual dimorphism
d) Genotype and environment interaction
89. Genes are packaged into a bacterial chromosome by____
a) histones b) basic protein c) acidic protein d) actin
90. In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is
a) 0.4 b) 0.5 c) 0.6 d) 0.7
91. There are three genes a, b, c percentage of cross over between a and b is 20% b and c is 28% a and c is 8%. What is the sequence of genes chromosome:
a) b, a, c b) a, b, c c) a, c, d d) None
92. Whose experiments cracked DNA and discovered triplet nature of genetic code?
a) Nirenberg and Mathaei b) Beadle and Tatum c) Hershey and Chase
d) Morgan and Sturtevant
93. If the base sequence in DNA is 5'AAAA 3' then the bases sequence in m-RNA is
a) 5'UUUU3' b) 3'UUUU5' c) 5'AAAA3' d) 3'TTTT5'
94. Removal of RNA polymerase III from nucleoplasm will affect the synthesis of_____
a) tRNA b) hnRNA c) mRNA d) rRNA
95. Which enzymes will be produced in a cell in which there is a nonsense mutation in the lac Y gene?
a) Laotose permease b) Transacetylase c) Lactose permease and transcetylase
d) b- galactosidase
96. Heterochromatin is
a) Genetically active b) Transcriptionally inactive c) Lightly stained
d) With loosely coiled DNA
97. Sick cell anemia is
a) Characterized by elongated sickle like RBCs with a nucleus
b) An autosomal linked dominant trait
c) Caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin
d) Caused by a change in a single base pair of DNA

98. What does "lac" refer to in what we call the lac operon?
 a) The number 1,00,000 b) Lactose c) Lactase d) Lac insect
99. Heterozygous tall plants were crossed with dwarf plants. what will be the ratio of dwarf plants in the progeny:
 a) 50% b) 25% c) 75% d) 100%
100. Which of following RNA has majority of modified or unusual bases?
 a) rRNA b) mRNA c) hnRNA d) tRNA
101. **Assertion:** In Griffith's experiment, a mixture of heat- killed virulent bacteria R and live non-virulent bacteria S, lead to the death of mice.
Reason: 'Transforming principle' got transferred from heat-killed R strain to S strain and made it virulent.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false
102. Match column I with column II and select the correct option from the given codes.
- | Column I | | Column II |
|--------------------|-------|---------------------------|
| A. Translation | (i) | Aminoacyl tRNA synthetase |
| B. Transcription | (ii) | Okazaki fragments |
| C. DNA replication | (iii) | RNA polymerase |
- a) A-(ii), B-(i), C-(iii) b) A-(i), B-(iii), C-(ii) c) A-(iii), B-(i), C-(ii) d) A-(ii), B-(iii), C-(i)
103. Nucleosome core is made of _____
 a) H1, H2 A, H2 B and H3 b) H1, H2 A, H2 B and H4 c) H1, H2 A, H2 B, H3 and H4
 d) H2 A, H2 B, H3 and H4
104. The first phase of translation is _____
 a) Aminoacylation of tRNA b) Recognition of an anti-codon
 c) Binding of mRNA to ribosome d) Recognition of DNA molecule
105. In which direction m-RNA is synthesised on DNA template?
 a) 5'→3' b) 3'→5' c) Both (a) and (b) d) Any
106. A nucleotide is formed of _____
 a) purine, pyrimidine and phosphate b) purine, sugar and phosphate
 c) nitrogen base, sugar and phosphate d) pyrimidine, sugar and phosphate
107. The fully processed hnRNA is called as _____ (i) _____ and is transported out of the _____ (ii) _____ into the _____ (iii) _____ for translation.
- a)
- | (i) | (ii) | (iii) |
|------|---------|-----------|
| mRNA | nucleus | cytoplasm |
- b)
- | (i) | (ii) | (iii) |
|------|-----------|---------|
| mRNA | cytoplasm | nucleus |
- c)
- | (i) | (ii) | (iii) |
|------|-----------|---------|
| tRNA | cytoplasm | nucleus |
- d)
- | (i) | (ii) | (iii) |
|------|---------|-----------|
| tRNA | nucleus | cytoplasm |
108. Double helix model of DNA which was proposed by Watson and Crick was of
 a) C-DNA b) B-DNA c) D-DNA d) Z-DNA

109. A and B genes are linked, what shall be genotype of progeny in a cross between AB/ab and aabb:
a) AAbb and aabb b) AaBb and aabb c) AABB and aabb d) None
110. ABO blood groups in humans are controlled by the gene I. It has three alleles- I^A , I^B and i. Since there are three different alleles, six different genotype are possible. How many phenotypes can occur?
a) Four b) Two c) Three d) One
111. Which enzyme is used in transcription
a) Amino acyl synthetase b) DNA polymerase III c) RNA polymerase d) DNA ligase
112. Other than DNA polymerase, which of the following enzymes involved in DNA synthesis?
a) Topoisomerase b) Helicase c) RNA primase d) All of these
113. In a DNA molecule, the phosphate group is attached to carbon _____ of the sugar residue of its own nucleotide and carbon _____ of the sugar residue of the next nucleotide by _____ bonds.
a) 5', 3', phosphodiester b) 3', 5', phosphodiester c) 5', 3', glycosidic d) 3', 5', glycosidic
114. If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6×10^9 dp, then the length of the DNA is approximately _____.
a) 2.2 meters b) 2.7 meters c) 2.0 meters d) 2.5 meters
115. No. of Bar Body in XXXX female
a) 1 b) 2 c) 3 d) 4
116. In one polynucleotide strand of a DNA molecule the ratio of A + T/G + C is 0.3. What is the A + G/T + C ratio of the entire DNA molecule?
a) 0.3 b) 0.6 c) 1.2 d) 1
117. E.coli cells with a mutated z gene of the lac operon cannot grow in medium containing only lactose as the source of energy because _____.
a) the lac operon is constitutively active in these cells.
b) they cannot synthesise functional beta - galactosidase.
c) in the presence of glucose, E.coli cells do not utilize lactose.
d) they cannot transport lactose from the medium into the cell.
118. The sequence of structural genes in lac operon is:
a) Lac A, Lac Y, Lac Z b) Lac A, Lac Z, Lac Y c) Lac Y, Lac Z, Lac A
d) Lac Z, Lac Y, Lac A
119. DNA dependent RNA polymerase catalyses transcription on one stand of DNA which is called the
a) Antistrand b) Template strand c) Coding strand d) Alpha strand
120. A DNA template plus primer with the structure
3' (P)-TGCGAATTAGCGACAT-(P)5'
5' (P)-ATCGGTACGACGCTTAAC-OH3'
(where P = a phosphate group) is placed in an in vitro DNA synthesis system containing Mg^{2+} , an excess of the four deoxyribonucleoside triphosphates, etc. and a mutant form of E. coli DNA polymerase I that lacks 5' ~ 3' exonuclease activity. The 5' ~ 3' polymerase and 3' ~ 5'

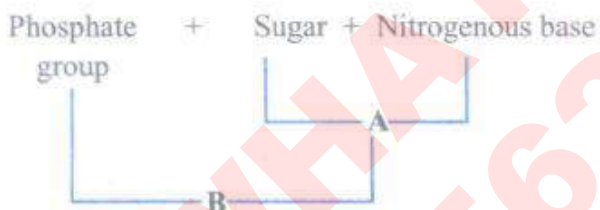
exonuclease activities of this aberrant enzyme are identical to those of normal E. coli DNA polymerase I. It simply has no 5' ~ 3' exonuclease activity. What will be the structure of the final product?

- a) $3' \text{ (P) } - \text{TGCGAATTAGCGACAT} - \text{(P) } 5'$
 $5' \text{ (P) } - \text{ATCGGTACGACGCTTAATCGCTGTA} - \text{OH } 3'$
- b) $3' \text{ (P) } - \text{TGCGAATTGGCGACAT} - \text{(P) } 5'$
 $5' \text{ (P) } - \text{ATCGGTACGACGCTTAACCGCTGTA} - \text{OH } 3'$
- c) $3' \text{ HO} - \text{TGCGAATTAGCGACAT} - \text{(P) } 5'$
 $5' - \text{ATCGGTACGACGCTTAATCGCTGTA} - \text{(P) } 3'$
- d) $3' \text{ (P) } - \text{TGCGAATTAGCGACAT} - \text{(P) } 5'$
 $5' \text{ (P) } - \text{ACGCTTAATCGCTGTA} - \text{OH } 3'$

121. Haemophilic gene does not transfer from:
a) Haemophilic father to son b) Haemophilic mother to son
c) Haemophilic father to daughter d) Haemophilic mother to son & daughter
122. All of the following are part of an operon except:
a) an enhancer b) structural genes c) an operator d) a promoter
123. A useful process for determining whether an individual is homozygous or heterozygous is:
a) Cross-breeding b) self fertilization c) Back-crossing d) Test cross
124. Genetic drift operates in :
a) Non- reproductive population b) slow reproductive population
c) Small isolated population d) Large isolated population
125. Complete linkage is found in
a) Birds b) Snakes c) Female- Drosophila d) Male- Drosophila
126. Severo Ochoa enzyme is
a) DNA polymerase b) Guanyl transferase c) Peptidyl transferase
d) Polynucleotide phosphorylase
127. A non-proteinaceous enzyme is :
a) Ligase b) Deoxyribonuclease c) Lysozyme d) Ribozyme
128. International Human Genome Project began in
a) 1990 b) 1996 c) 2000 d) 2001
129. A single recessive trait which can express its effect should occur on
a) Any autosome b) Any-chromosome c) X-chromosome of female
d) X-chromosome of male
130. **Assertion :** Template or antisense strand, having 3' ~ 5' polarity takes part in transcription.
Reason: Non-template or sense strand, having 5' ~ 3' polarity, does not take part in transcription.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
131. Which of the following may be true for RNA

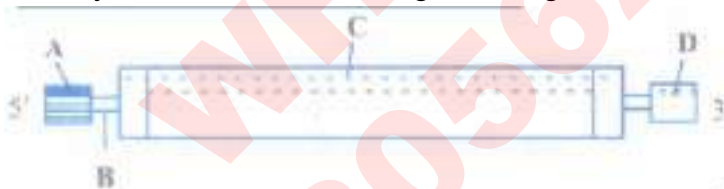
- a) $A = U, G = C$ b) $A \neq U, G \neq C$ c) $A = U = G = C$ d) Purines = Pyrimidines
132. During translation, activated amino acids get linked to tRNA. This process is commonly called as
a) charging of tRNA b) discharging of tRNA c) aminoacylation of tRNA
d) both (a) and (c).
133. During transcription, the DNA site at which RNA polymerase binds is called _____.
a) enhancer b) Promoter c) regulator d) receptor
134. When the codon of mRNA is 5'-GUC-3' then the anticodon on tRNA will be
a) 5'-CAG-3' b) 3'-CAG-5' c) 3'-CUG-5' d) 3'-CUG-5'
135. A molecule that can act as a genetic material must fulfill the traits given below, except:
a) It should be able to generate its replica
b) It should be unstable structurally and chemically
c) It should provide the scope for slow changes that are required for evolution
d) It should be able to express itself in the form of Mendelian characters
136. Functioning of structural genes is controlled by
a) Operator b) Promoter c) Ligase d) Regulator gene
137. Which of the following bond is not related to nucleic acid:
a) H-bond b) Ester bond c) Glycosidic bond d) Peptide bond
138. In split genes, the coding sequence are called _____.
a) introns b) operons c) exons d) cistrons
139. During protein synthesis in an organism, at one point the process comes to a half. Select the group of the three codons from the following from which any one of the three could bring about this half-
a) UUU, UCC, UAU b) UUC, UUA, UAC c) UAG, UGA, UAA d) UUG, UCA, UCG
140. Degeneration of a genetic code is attributed to the _____.
a) third member of a codon b) first member of a codon c) second member of a codon
d) entire codon
141. Bonding between deoxyribose' and base in purine nucleoside molecule is
a) H-bonding b) Phosphoester linkage c) Glycosidic linkage d) Phosphodiester linkage
142. Match column I with column II and select the correct option from the given codes.
- | Column I | | Column II |
|-----------------------|-------|-----------------------------------|
| A. Griffith | (i) | Lac operon |
| B. Hershey and Chase | (ii) | Semi-conservative DNA replication |
| C. Meselson and Stahl | (iii) | Transduction |
| D. Jacob and Monod | (iv) | Transformation |
- a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(iii), B-(iv), C-(ii), D-(i) c) A-(iv), B-(ii), C-(iii), D-(i)
d) A-(ii), B-(i), C-(iii), D-(iv)
143. Unidirectional flow of information is called central dogma, given by
a) F.H.C. Crick b) Temin c) Baltimore d) Dulbecco

144. Complete genome of which non-crop and crop plants has been sequenced?
a) Datura and wheat respectively b) Arabidopsis and maize respectively
c) Oenothera and oat respectively d) Arabidopsis and rice respectively
145. Select the correct match_____
a) TH Morgan - Transduction b) F_2 x Recessive parent - Dihybrid cross
c) Ribozyme - Nucleic acid d) G Mendel - Transformation
146. Escherichia coli fully labelled with N^{15} is allowed to grow in N^{14} medium. The two strands of DNA molecule of the first generation bacteria have_____
a) different density and do not resemble parent DNA
b) different density but resemble parent DNA c) same density and resemble parent DNA
d) same density but do not resemble parent DNA
147. Okazaki fragments are seen during_____
a) transcription b) translation c) replication d) transduction
148. If a colour-blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour-blind is :
a) 0.75 b) 1 c) 0 d) 0.5
149. The first genetic material could be
a) protein b) carbohydrates c) DNA d) RNA.
150. What does A and B represent in the given representation?



- a) A - Ribonucleoside, B - Deoxyribonucleoside
b) A - Ribonucleotide, B - Deoxyribonucleotide c) A - Nucleoside, B - Nucleotide
d) A - Nucleotide, B - Nucleoside
151. If the percentage of thymine is 35% in DNA double helix, then the percentage of guanine will be
a) 35% b) 70% c) 30% d) 15%
152. In the hexaploid wheat, the haploid (n) and basic (x) numbers of chromosomes are:
a) $n = 7$ and $x = 21$ b) $n = 21$ and $x = 21$ c) $n = 21$ and $x = 14$ d) $n = 21$ and $x = 7$
153. In Meselson and Stahl's experiment, heavy isotope ^{15}N was used in the form of
a) $Na^{15}NO_3$ b) $^{15}NH_4Cl$ c) $K^{15}NO_3$ d) $NH_4^{15}NO_3$
154. Which of the following is involved in translation:
a) DNA b) mRNA, tRNA, DNA c) mRNA, tRNA d) Only mRNA
155. In most of the plant viruses genetic material is
a) ssDNA b) ssRNA c) dsRNA d) ssRNA + ssDNA
156. Given below is a sample of a portion of DNA strand. What is so special shown in it?
5'-GAAITC-3'
3'-CTTAAG-5'

- a) Replication completed b) Deletion mutation c) Start codon at the 5' end
d) Palindromic sequence of base pairs
157. If 120 Plants are produced on crossing pure red and pure white flowered pea plants, then the ratio of off springs will be
a) 90 Red : 30 White b) 30 Red : 90 White c) 60 Red : 60 White d) All Red
158. The final proof for DNA as the genetic material came from the experiments of:
a) Griffith b) Hershey and Chase c) Avery, Mcleod and McCarty d) Hargobind Khorana
159. How many different kinds of gametes will be produced by a plant having the genotype AABbCC?
a) Three b) Four c) Nine d) Two
160. Genes do not occur in pairs in
a) Zygote b) Somatic cell c) Endosperm cell d) Gametes
161. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the F_1 Plant were selfed the resulting genotype were in the ratio of:
a) 1:2:1 :: Tall homozygous : Tall heterozygous : Dwarf
b) 1:2:1 :: Tall heterozygous : Tall homozygous : Dwarf c) 3:1 :: Tall : Dwarf
d) 3:1 :: Dwarf : Tall
162. Which one is not a part of transcription unit in DNA?
a) The inducer b) Promoter c) Terminator d) Structural gene
163. There will be no Barr body in female suffering from:
a) Turner syndrome b) Klinefelter syndrome c) Down syndrome d) Haemophilia
164. Identify A, B, C and D in the given diagram of mRNA.



a)

A	B	C	D
Methylated cap	Initiation codon	Termination codon	PolyA tail

b)

A	B	C	D
PolyA tail	Termination codon	Initiation codon	Methylated cap

c)

A	B	C	D
Methylated cap	Non-coding region	coding region	PolyA tail

d)

A	B	C	D
Methylated cap	coding region	Non-coding region	PolyA tail

165. The fact that a purine base always paired through hydrogen bonds with a pyrimidine base leads to, in the DNA double helix
a) the antiparallel nature b) the semi-conservative nature
c) uniform width throughout DNA d) uniform length in all DNA.
166. Khorana first deciphered the triplet codons of _____
a) serine and isoleucine b) threonine and histidine c) tyrosine and tryptophan
d) phenylalanine and methionine

167. The length of DNA molecule greatly exceeds the dimensions of the nucleus in eukaryotic cells. How is this DNA accommodated?
a) deletion of non-essential genes b) super-coiling in nucleosomes c) DNase digestion
d) through elimination of repetitive DNA
168. Initiation codon is
a) AUG b) UAG c) UGA d) UAA
169. Polycistronic messenger RNA (mRNA) usually occurs in
a) bacteria b) prokaryotes c) eukaryotes d) both (a) and (b).
170. The linkage map of X-chromosome of fruitfly 66units, with yellow body gene (y) at one end bobbed hair (b) gene at the other end. recombination frequency between these two get (y and b) should be:
a) 60% b) >50% c) ≤50% d) 100%
171. **Assertion:** The mechanism of DNA replication is semi- conservative in nature.
Reason : Each of the complementary strands of the parental double helix is conserved during the process
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
172. In a DNA strand the nucleotides are linked together by
a) glycosidic bonds b) phosphodiester bonds c) peptide bonds d) hydrogen bonds.
173. The incorrect statement with regard to Haemophilia is
a) A single protein involved in the clotting of blood is affected b) It is a sex-linked disease
c) It is a recessive disease d) It is a dominant disease
174. DNA acts as a template for synthesis of
a) RNA b) DNA c) Both 'a' and 'b' d) Protein
175. Which one of the following is a case of wrong matching?
a) Micropropagation-In vitro production of plants in large numbers
b) Callus - Unorganised mass of cells produced in tissue culture
c) Somatic hybridization - Fusion of two diverse cells
d) Vector DNA - Site for t-RNA synthesis
176. The process of transformation is not affected by which of the following enzymes?
A. DNase
B. RNase
C. Peptidase
D. Lipase
a) A, B b) A, B, C, D c) B, C, D d) A, B, C
177. Which of the following criteria should be fulfilled by a molecule to act as a genetic material?
(i) It should be able to replicate.
(ii) It should be structurally and chemically stable.
(iii) It should be able to undergo slow mutations.
(iv) It should be able to express itself in the form of 'Mendelian characters'.

- a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)
178. Prokaryotic topoisomerase is
a) Helicase b) Primase c) DNA polymerase d) DNA gyrase
179. C value is the characteristic DNA content in a haploid cell of a given species. Earlier it was considered that C-value correlates with organism complexity. However, it is now evident that C value varies enormously among species and that this bears no correlation with the complexity of the organisms. For example, the cells of some salamanders may contain 40 times more DNA than those of humans.
Which of the following explains this C value paradox?
a) Polyploidy b) Chromosomal mutation c) Non-coding DNA d) Coding DNA
180. Protein helping in opening of DNA double helix in front of replication fork is ____
a) DNA gyrase b) DNA polymerase-I c) DNA ligase d) topoisomerase
181. The promoter site and the terminator site for transcription are located at
a) 3' (downstream) end and 5' (upstream) end, respectively of the transcription unit
b) 5' (upstream) end and 3' (downstream) end, respectively of the transcription unit
c) the 5' (upstream) end d) the 3' (downstream) end.
182. In a DNA percentage of thymine is 20% then what will be the percentage of guanine?
a) 20% b) 40% c) 30% d) 60%
183. The structure in chromatin seen as 'beads-on string' when viewed under electron microscope are called
a) nucleotides b) nucleosides c) histone octamer d) nucleosomes.
184. Which of the following RNA play structural and catalytic role during translation
a) m-RNA b) t-RNA c) r-RNA d) All
185. The first codon discovered by Nirenberg and Mathei was
a) CCC b) GGG c) UUU d) AAA
186. In the genetic code dictionary how many codons are used to code for all the 20 essential amino acids?
a) 60 b) 20 c) 64 d) 61
187. UTRs are the untranslated regions present on:
a) rRNA b) tRNA c) mRNA d) hnRNA.
188. A certain road accident patient with unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor?
a) Blood group O b) Blood group A c) Blood group B d) Blood group AB
189. Messenger RNA is produced in
a) Nucleus b) Golgi apparatus c) Endoplasmic reticulum d) Ribosomes
190. In which one of the following combinations (1-4) of the number of the chromosomes is the present day hexaploid wheat correctly represented

a)

Combination	(1)	(2)	(3)	(4)
Monosomic	21	7	21	41

b)

Combination	(1)	(2)	(3)	(4)
Haploid	28	28	7	21

c)

Combination	(1)	(2)	(3)	(4)
Nullisomic	42	40	42	40

d)

Combination	(1)	(2)	(3)	(4)
Trisomic	43	42	43	43

191. Gene and cistron words are sometimes used synonymously because _____
 a) one cistron contains many genes b) one gene contains many cistrons
 c) one gene contains one cistron d) one gene contains no cistron
192. What set of RNA are involved in protein synthesis
 a) tRNA, mRNA, rRNA b) tRNA, mRNA, hnRNA c) hnRNA, mRNA, rRNA
 d) hnRNA, tRNA, rRNA
193. Which one of the following conditions correctly describes the manner of determining the sex in the given example?
 a) Homozygous sex chromosomes (ZZ) determine female sex in Birds.
 b) XO type of sex chromosomes determine male sex in grasshopper
 c) XO condition in humans as found in Turner syndrome, determines female sex.
 d) Homozygous sex chromosomes (XX) produce male in Drosophila
194. DNA fragments are _____
 a) negatively charged b) neutral
 c) either positively or negatively charged depending on their size d) positively charged
195. DNA elements, which can switch their position, are called _____.
 a) exons b) introns c) cistrons d) transposons
196. t-RNA attach to larger subunit of ribosome with the help of which loop
 a) DHU-loop b) TΨC loop c) Anticodon loop d) Minor loop
197. A phenomenon which works opposite to linkage is
 a) Independent assortment b) Crossing-over c) Segregation d) Mutation
198. **Assertion** : DNA is considered to be better genetic material than RNA for most organisms.
Reason: 2' - OH group present in DNA makes it labile and less reactive.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false
199. If a colourblind woman marries a normal visioned man, their sons will be-
 a) All normal visioned b) One-half colourblind and one-half normal
 c) Three-fourths colourblind and one-fourth normal d) All colourblind
200. Which of the following statements is the most appropriate for sickle cell anaemia?
 a) It cannot be treated with iron supplements. b) It is a molecular disease.
 c) It confers resistance to acquiring malaria. d) All of the above.
201. Which of the following statements is correct?

- a) Adenine pairs with thymine through three H-bonds
b) Adenine does not pair with thymine c) Adenine pairs with thymine through two H-bonds
d) Adenine pairs with thymine through one H-bond.
202. Multiple alleles are present:
a) At different loci on the same chromosome b) At the same locus of the chromosome
c) On non-sister chromatids d) On different chromosomes
203. In which mode of inheritance do you expect more maternal influence among the offspring?
a) Autosomal b) Cytoplasmic c) Y-linked d) X-linked
204. Whose experiments cracked the DNA and discovered unequivocally that a genetic code is a 'triplet' ____
a) Hershey and Chase b) Morgan and Sturtevant c) Beadle and Tatum
d) Nirenberg and Matthaei
205. Genes that are involved in turning on or off the transcription of a set of structural genes are called ____
a) polymorphic genes b) operator genes c) reductant genes d) regulatory genes
206. In which of the following hn RNA is formed?
a) Nostoc b) Rhizobium c) Chlamydomonas d) Mycoplasma
207. In RNA, thymine is replaced by ____
a) adenine b) guanine c) cytosine d) Uracil
208. PCR and Restriction Fragment Length Polymorphism are the methods for
a) DNA sequencing b) Genetic fingerprinting c) Study of enzymes
d) Genetic transformation
209. Find the correct match:
- | Column I | Column II |
|-----------------|-------------------|
| a. Human genome | (i) 30,000 bp |
| b. DMD | (ii) 2400 kbp |
| c. TDF | (iii) 1.4 million |
| d. SNPs | (iv) 14bp |
| | (v) 30,000 genes |
- a) a(i), b(ii), c(iii), d(iv) b) a(i), b(ii), c(iv), d(iii) c) a(v), b(ii), c(iv), d(iii)
d) a(v), b(ii), c(iii), d(iv)
210. Amino acid acceptor end of tRNA lies at
a) 5' end b) 3' end c) T Ψ C loop d) DHU loop.
211. Long lived RNA is:
a) rRNA b) mRNA c) tRNA d) hnRNA
212. If there are 10,000 nitrogenous base pairs in a DNA then how many nucleotides are there
a) 500 b) 10000 c) 20000 d) 40000
213. Point mutation involves
a) Deletion b) Insertion c) Change in single base pair d) Duplication
214. In DNA strand, the nucleotides are linked together by

- a) glycosidic bonds b) phosphodiester bonds c) peptide bonds d) hydrogen bonds.
215. Back bone in structure of DNA molecule is made up of-
- a) Pentose Sugar and phosphate b) Hexose sugar and phosphate
c) Purine and pyrimidine d) Sugar and phosphate
216. Estimated number of genes in human beings is
- a) 3,000 b) 80,000 c) 20,500 d) 3×10^9
217. Experimental material used in transformation experiment was
- a) Bacillus b) Bacteriophage c) Diplococcus d) E.coli
218. A population will not exist in Hardy- Weinberg equilibrium if:
- a) There are no mutations b) There are no migration c) The population is large
d) Individuals mate selectively
219. Watson and Crick (1953) proposed DNA double helix model and won the Nobel Prize; their model of DNA was based on
- (i) X-ray diffraction studies of DNA done by Wilkins and Franklin
(ii) Chargaff's base equivalence rule
(iii) Griffith's transformation experiment
(iv) Meselson and Stahl's experiment.
- a) (i), (ii) and (iv) b) (i) and (ii) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)
220. Read the sequence of nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain to answer the Q. nos. 65 and 66.
- | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|
| mRNA | AUG | UUU | AUG | CCU | GUU | UCU | UAA |
| Polypeptide | Met | Phe | Met | Pro | Val | Ser | |
- Which codons respectively code for proline and valine amino acids in the given polypeptide chain, respectively?
- a) CCU and GUU b) GUU and UCU c) UCU and UAA d) GUU and CCU
221. Read the following four statements (A - D).
- (A) In transcription, adenosine pairs with uracil
(B) Regulation of lac operon by repressor is referred to as positive regulation
(C) The human genome has approximately 50,000 genes
(D) Haemophilia is a sex-linked recessive disease
- How many of the above statements are right?
- a) Two b) Three c) Four d) One
222. The experimental proof for semi-conservative replication of DNA was first shown in a:
- a) Plant b) Bacterium c) Fungus d) Virus
223. Grey is dominant (G) over black (g). Which of the following will most probably give 50% black and 50% grey offspring?
- a) GG x gg b) Gg x gg c) GG x Gg d) gg x gg
224. Kornberg enzyme is known as
- a) DNA polymerase I b) DNA polymerase II c) DNA polymerase III d) RNA polymerase
225. During replication of a bacterial chromosome DNA synthesis starts from a replication origin site and _____

- a) RNA primers are involved b) is facilitated by telomerase
c) moves in one direction of the site d) moves in bi-directional way
226. What would happen if in a gene encoding a polypeptide of 50 amino acids, 25th codon (UAU) is mutated to UAA?
- a) A polypeptide of 24 amino acids will be formed.
b) Two polypeptides of 24 and 25 amino acids will be formed.
c) A polypeptide of 49 amino acids will be formed.
d) A polypeptide of 25 amino acids will be formed.
227. Wilkins X-ray diffraction showed the diameter the DNA helix is-
- a) 10Å b) 20Å c) 30Å d) 40Å
228. The basis for DNA fingerprinting is_____
- a) occurrence of Restriction Fragment Length Polymorphism(RFLP)
b) phenotypic differences between individuals c) availability of cloned DNA
d) knowledge of human karyotype
229. Assertion: Synthesis of daughter or new strand occurs continuously along the parent 3'→5' strand.
Reason: DNA polymerase can polymerise nucleotides in 3'→5' direction on 5'→3' strand.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
230. Which one of the following conditions of zygotic cell would lead to the birth of a normal human female child?
- a) One X and one Y chromosome b) Two X chromosome c) Two X chromosome
d) Only one X chromosome
231. Match column I with column II and select the correct option from the given codes.
- | | Column I | | Column II |
|----|---------------|-------|-------------|
| A. | Sigma factor | (i) | 5'-3' |
| B. | Capjling | (ii) | Initiation |
| C. | Tailing | (iii) | Termination |
| D. | Coding strand | (iv) | 5' end |
| | | (v) | 3' end |
- a) A-(iii), B-(v), C-(iv), D-(ii) b) A-(ii), B-(iv), C-(v), D-(i) c) A-(ii), B-(iv), C-(v), D-(iii)
d) A-(iii), B-(v), C-(iv), D-(i)
232. To initiate translation, the mRNA first binds to
- a) the smaller ribosomal sub-unit b) the larger ribosomal sub-unit c) the whole ribosome
d) no such specificity exists.
233. Translation refers to the process of-
- a) Polymerisation of nitrogen bases b) Polymerisation of nucleotides
c) Polymerisation of nucleosides d) Polymerisation of amino acids
234. Transfer of genetic information from a polymer of nucleotides to a polymer of amino acid is -
- a) Replication b) Transcription c) Translation d) Reverse transcription

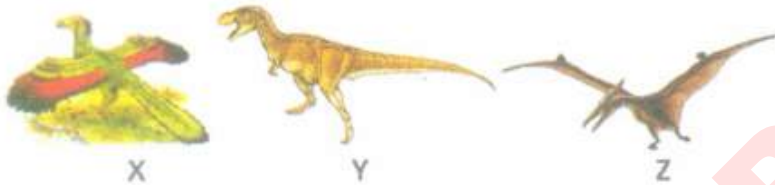
235. The net electric charge on DNA and histones is
a) both positive b) both negative c) negative and positive, respectively d) zero
236. Pick out the correct statements:
(a) Haemophilia is a sex-linked recessive disease.
(b) Down's syndrome is due to aneuploidy.
(c) Phenylketonuria is an autosomal recessive gene disorder.
(d) Sickle cell anaemia is a X-linked recessive gene disorder.
a) (a) and (b) are correct b) (b) and (d) are correct c) (a), (c) and (d) are correct
d) (a), (b) and (c) are correct
237. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by:
a) pq b) q^2 c) P^2 d) $2pq$
238. A pleiotropic gene:
a) controls multiple traits in an individual b) is expressed only in primitive plants
c) is a gene evolved during Pliocene
d) controls a trait only in combination with another gene
239. RNA is the genetic material in
a) prokaryotes b) eukaryotes c) Tobacco Mosaic Virus (TMV) d) *E. coli*.
240. In negative operon _____
a) co-repressor binds with repressor b) co-repressor does not bind with repressor
c) co-repressor binds with inducer d) CAMP have negative effect on lac operon
241. A bacterium with completely radioactive DNA was allowed to replicate in a non-radioactive medium for two generations. What % of the bacteria should contain radioactive DNA
a) 100% b) 50% c) 25% d) 12.5%
242. Which Mendelian idea is depicted by a cross in which the F_1 generation resembles both the parents?
a) co-dominance b) Incomplete dominance c) Law of dominance
d) inheritance of one gene
243. Which one of the following makes use of RNA as a template to synthesize DNA?
a) DNA polymerase b) RNA polymerase c) Reverse transcriptase
d) DNA dependent RNA polymerase
244. A complex of ribosomes attached to a single strand of RNA is known as
a) Okazaki fragment b) polysome c) Polymer d) Polypeptide
245. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offspring?
a) A, B and AB only b) A, B, AB and O c) O only d) A and B only
246. The diagram shows an important concept in the genetic implication of DNA. Fill in the blanks A to C.



- a) A-transcription, B-replication, C-James Watson
 - b) A-translation, B-transcription, C-Everyin Charagaff
 - c) A-transcription, B-translation, C-Francis Crick
 - d) A-translation, B-extension, C-Rosalind Franklin
247. Reverse transcriptase is _____
- a) RNA dependent RNA polymerase b) DNA dependent RNA polymerase
 - c) DNA dependent DNA polymerase d) RNA dependent DNA polymerase
248. Spliceosomes are not found in cells of _____
- a) Fungi b) Animals c) Bacteria d) plants
249. Select the incorrect statement from the following
- a) Baldness is a sex- limited trait
 - b) Linkage is an exception to the principle of independent assortment in heredity
 - c) Galactosemia is an inborn error of metabolism
 - d) Small population size results in random genetic drift in a population
250. Ligase enzyme is used for-
- a) Denaturation of DNA b) splitting DNA into small bits c) Joining bits of DNA
 - d) Digestion of lipids

**RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308****Time : 1 Mins****EVOLUTION 1****Marks : 996**

1. Refer to the given figure and select the correct option regarding X, Y and Z.



a)

X	Y	Y
Brachiosaurus	Archaeopteryx	Triceratops

b)

X	Y	Y
Archaeopteryx	Tyrannosaurus	Pteranodon

c)

X	Y	Y
Archaeopteryx	Stegosaurus	Tyrannosaurus

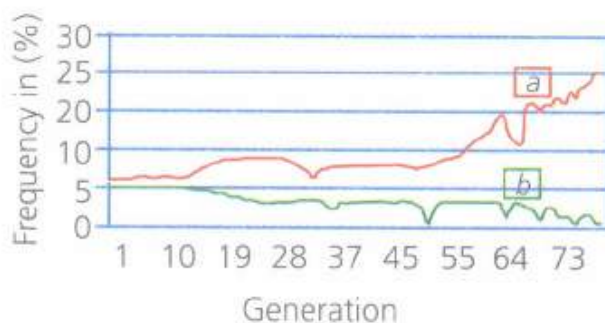
d)

X	Y	Y
Archaeopteryx	Brachiosaurus	Triceratops

- The first organisms were _____.
a) chemoautotrophs b) chemoheterotrophs c) autotrophs d) eukaryotes
- The finches of Galapagos islands provide an evidence in favour of _____.
a) evolution due to mutation b) retrogressive evolution c) biogeographical evolution
d) special creation
- The wings of a bird and the wings of an insect are:
a) Homologous structures and represent divergent evolution
b) Analogous structures and represent convergent evolution
c) Phylogenie structures and represent divergent evolution
d) Homologous structures and represent convergent evolution
- Variations caused by mutation, as proposed by Hugo de Vries are _____.
a) random and directionless b) small and directional c) small and directionless
d) random and directional
- Genetic drift operates in:
a) Small isolated population b) Large isolated population
c) Non-reproductive population d) Slow reproductive population
- Which of the following is the relatively most accurate method for dating of fossils?
a) Radio-carbon method b) Potassium-argon method
c) Electron-spin resonance method d) Uranium-lead method
- One of the important consequences of geographical isolation is _____.

- a) preventing speciation b) speciation through reproductive isolation
c) random creation of new species d) no change in the isolated fauna
9. The first non-cellular form of life could have originated _____ billion years back
a) 3 b) 8 c) 10 d) 1
10. **Assertion:** Darwin's finches of Galapagos islands have different types of modified beaks according to their food habits.
Reason: Adaptive radiation, leads to development of different functional structure from a common ancestral form.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
11. The following summaries describe some published research results.
- Research 1. Wu and Li (1985):** The comparative analysis of homologous genes between human and mouse genomes suggests that the evolutionary rate of homologous genes was higher in the mouse lineage than in the human lineage.
- Research 2. Smith and Donohue (2008):** The plant families Caprifoliaceae, Asclepiadaceae, and Lamiaceae are composed of both herbaceous and arborescent species. The comparative analysis of homologous genes between the herbaceous and arborescent species within a single plant family suggests that the evolutionary rate of homologous genes in herbaceous lineages were faster than that of arborescent lineages in all three plant families.
- Research 3. Gilman et al. (2009):** The comparative analysis of 130 homologous mitochondrial genes between a sister species pair of vertebrates from the temperate region and from the tropical region indicate that the base substitution rates of homologous genes from the tropical region are 1.7 times faster than that of the temperate region.
- Based on these studies, which of the following statements best describes the common evolutionary processes in plant and animal genes?
- a)
The evolutionary rates of genes are accelerated in animals and plants which lived in higher temperature regions
- b)
Direct comparisons of homologous genes between animals and plants show that the plants evolve faster than animals.
- c) The evolutionary rates of genes are accelerated in short-lived animals and plants
- d) The evolutionary rates of genes are accelerated in higher animals and plants

12. Darwin's theory of pangenesis shows similarity with theory of inheritance of acquired characters then what shall be correct according to it?
- Useful organs become strong and developed while useless organs become extinct. These organs help in struggle for survival
 - Size of organs increase with ageing
 - Development of organs is due to will power
 - There should be some physical basis of inheritance
13. The brain capacity of *Homo erectus* was about
- 650 c.c.
 - 900 c.c.
 - 1500 c.c.
 - 1400 c.c.
14. Which of the following is correct order of the evolutionary history of man?
- Peking man, *Homo sapiens*, Neanderthal man, Cro-Magnon man
 - Peking man, Neanderthal man, Heidelberg man, Cro-Magnon man
 - Peking man, Heidelberg man, Neanderthal man, Cro-Magnon man
 - Peking man, Neanderthal man, *Homo sapiens*, Heidelberg man
15. 'Golden age of dinosaurs' Age of reptiles was _____.
- Mesozoic
 - Coenozoic
 - Palaeozoic
 - psychozoic
16. Consider the following three statements and select the correct option stating which one is true (T) and which one is false (F).
- Some land reptiles went back into water to evolve into fish like reptiles probably 200 mya
 - The first mammals were like shrews.
 - The work of Thomas Malthus on populations influenced Lamarck.
- | | | |
|---|----|-----|
| i | ii | iii |
| T | F | T |
 - | | | |
|---|----|-----|
| i | ii | iii |
| F | T | T |
 - | | | |
|---|----|-----|
| i | ii | iii |
| T | T | F |
 - | | | |
|---|----|-----|
| i | ii | iii |
| F | T | F |
17. The presence of gill slits, in the embryos of all vertebrates, supports the theory of _____
- biogenesis
 - recapitulation
 - metamorphosis
 - organic evolution
18. In a long term experiment on a population of *Drosophila melanogaster*, the frequency of two alleles 'a' and 'b' of a multi-allelic locus X over time has been shown in the following graph.



6 students were asked to evaluate the observed pattern and their inferences are given below.

Student 1 : Environment is not uniformly selective.

Student 2 : Population may be under artificial selection.

Student 3 : Genetic variability is progressively reduced.

Student 4 : Genetic variability is progressively increased.

Student 5 : Mechanism such as genetic drift is operating from time to time.

Student 6 : Selection is favouring a particular genotype through directional selection.

The appropriate conclusions were drawn by:

- a) Students 2, 5 and 6 b) Students 1, 3 and 5 c) Students 2, 3 and 6
- d) Students 1, 3 and 6.

19. Evolutionary convergence is characterised by

- a) development of dissimilar characteristics in closely related groups
- b) development of a common set of characteristics in groups of different ancestry
- c) development of characteristics by random mating
- d) replacement of common characteristics in different groups.

20. Which of the following is used as an atmospheric pollution indicator?

- a) Lepidoptera b) Lichens c) Lycopersicon d) Lycopodium

21. Which of the following statements is correct regarding evolution of mankind?

- a) Homo erectus is preceded by Homo habilis
- b) Neanderthal man and Cro-Magnon man were living at the same time.
- c) Australopithecus was living in Australia d) None of these

22. The preserved fossil remains of **Archaeopteryx** show that

- a) it was a flying reptile from the Permian period
- b) reptiles gave rise to birds during Jurassic period
- c) it was a flying reptile in the Triassic period
- d) reptiles gave rise to birds during Permian period

23. Which of the following represents order of Horse?

- a) Perissodactyla b) Caballus c) Ferus d) Equidae

24. Fossils are generally found in

- a) sedimentary rocks b) igneous rocks c) metamorphic rocks d) any type of rock

25. The similarity of bone structure in the forelimbs of many vertebrates is an example of:

- a) Convergent evolution b) Analogy c) Homology d) Adaptive radiation

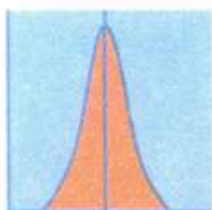
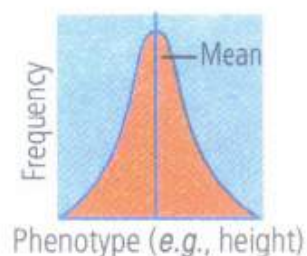
26. According to Lamarckism, long necked giraffes evolved because

- a) nature selected only long necked ones b) humans preferred only long necked ones
- c) short necks suddenly changed into long necks
- d) of stretching of necks over many generations by short necked ones.

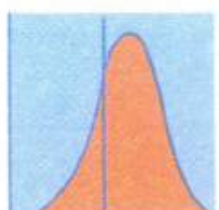
27. Age of fossils in the past was generally determined by radio-carbon method and

other/methods involving radioactive elements found in the rocks. More precise methods, which were used recently and led to the revision of the evolutionary periods for different groups of organisms, includes_____

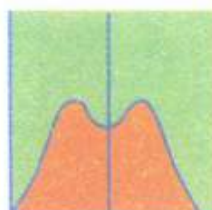
- a) study of carbohydrates/proteins in fossils b) study of the conditions of fossilisation
c) electron spin resonance (ESR) and fossil DNA
d) study of carbohydrates/proteins in rocks
28. In which condition the gene ratio remains constant for any species?
a) Sexual selection b) Random mating c) Mutation d) Gene flow
29. **Assertion:** The chimpanzee is the closest relative of the present day humans.
Reason: The banding pattern in some autosomes of man and chimpanzee is remarkably similar.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
30. Embryological support for evolution was disapproved by _____.
a) Charles Darwin b) Oparin c) Karl Ernst von Baer d) Alfred wallace
31. Correct order is _____.
a) Palaeozoic → Archaeozoic → Coenozoic
b) Archaeozoic → Palaeozoic → Proterozoic c) Palaeozoic → Mesozoic → Coenozoic
d) Mesozoic → Archacozoic → Proterozoic
32. Evolutionary history of an organism is known as _____.
a) Ancestry b) Paleontology c) Ontogeny d) Phylogeny
33. Which of the following are homologous organs?
a) Wings of birds and locust b) Wings of birds (sparrow) and pectoral fins of fish
c) Wings of bat and butterfly d) Legs of frog and cockroach
34. Following is the digrammatic representation of the operation of natural selection on different traits. Which of the following options correctly identifies all the three graphs A, B and C?



A



B



C

a)

A	B	C
Directional	Stabilising	Disruptive

b)

A	B	C
Stabilising	Directional	Disruptive

c)

A	B	C
Disruptive	Stabilising	Directional

d)

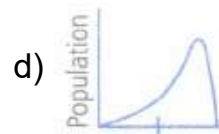
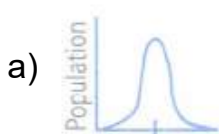
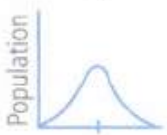
A	B	C
Directional	Disruptive	Stabilising

35. Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as _____
a) Genetic drift b) Random mating c) Genetic load d) Genetic flow
36. The effects of genetic drift are more marked in
a) larger populations b) Mendelian populations c) island populations
d) smaller populations
37. Which one of the following amino-acids was not found to be synthesised in Miller's experiment?
a) Aspartic acid b) Glutamic acid c) Alanine d) Glycine
38. What is common to whale, seal and shark?
a) Thick subcutaneous fat b) Convergent evolution c) Homiothermy
d) Seasonal migration
39. Which one of the following experiments suggests that simplest living organisms could not have originated spontaneously from non-living matter?
a) Larvae could appear in decaying organic matter.
b) Microbes can appear on bread kept at a moist place.
c) Microbes appear on unsterilised organic matter.
d) Meat was not spoiled, when heated and kept sealed in a vessel.
40. **Assertion:** Thorns and tendrils of **Bougainvillea** and **Cucurbita** represent homology.
Reason: Homologous organs have similar functions but are different in their structural details and origin.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
41. Among the following sets of examples for divergent evolution, select the incorrect option _____.
a) Brain of bat, man and cheetah b) Heart of bat, man and cheetah
c) Forelimbs of man, bat and cheetah d) Eye of Octopus, bat and man
42. An important evidence in favour of organic evolution is the occurrence of _____.
a) Analogous and vestigial organs b) Homologous organs only
c) Homologous and analogous organs d) Homologous and vestigial organs

43. For the M N-blood group system, the frequencies of M and N alleles are 0.7 and 0.3, respectively. The expected frequency of MN-blood group bearing organisms is likely to be
a) 42% b) 49% c) 9% d) 58%.
44. The 'Devonian period' is considered to be as
a) age of fishes b) age of amphibians c) age of reptiles d) age of mammals
45. Which of following represents correct order of evolution?
a) Amoeba → Leucosolenia → Hydra → Ascaris
b) Leucosolenia → Hydra → Amoeba → Ascaris
c) Ascaris → Amoeba → Leucosolenia → Hydra d) None of these
46. de Vries gave his mutation theory on organic evolution while working on,____
a) Pisum sativum b) Drosophila melanogaster c) Oenothera lamarckiana
d) Althen rosea
47. By the statement 'survival of the fittest', Darwin meant that
a) the strongest of all species survives b) the most intelligent of the species survives
c) the cleverest of the species survives.
d) the species most adaptable to changes survives.
48. Which of the following statements is correct?
a) Australopithecus has large brain around 900 c.c.
b) Neanderthal man lived in East Africa and ate fruits
c) Homo erectus had brain capacity of 900 c.c.
d)
Homo sapiens arose in Central Asia and moved to other continents and developed into distinct races.
49. A population will not exist in Hardy -Weinberg equilibrium if_____.
a) There are no mutations b) There is no migration c) The population is large
d) Individuals mate selectively
50. Industrial melanism is an example of_____
a) defensive adaptation of skin against ultraviolet radiations b) drug resistance
c) darkening of skin due to smoke from industries
d) protective resemblance with the surroundings
51. Which of the following is most important for speciation?
a) Seasonal isolation b) Reproductive isolation c) Behavioural isolation
d) Tropical isolation
52. Which one of the following statement is correct?
a) There is no evidence of the existence of gills during embryogenesis of mammals
b) All plant and animal cells are totipotent. c) Ontogeny repeats phylogeny
d) Stem cells are specialize cells
53. Darwinism explains all the following except

- a)
offspring with better traits that overcome competition are best suited for the environment
- b) variations may or may not be inherited from parents to offspring through genes
- c) within each species, there are variations
- d) organisms tend to produce more number of offspring than can survive.
54. Given below are the three statements each with one or two blanks. Select the option which correctly fills up the blanks in any two statements.
- (A) For a long time it was also believed that life came out of decaying and rotting matter like straw, mud, etc. This was the theory of ____ (i) ____
- (B) During post-industrialisation period, the tree trunks became dark due to industrial smoke and soots. Under this condition the ____ (i) ____ did not survive due to predators, while ____ (ii) ____ survived.
- (C) Lamarck said that evolution of life forms had occurred but driven by ____ (i) ____ of organs.
- a) (A) - (i) panspermia, (C) - (i) natural selection
- b) (B) - (i) white-winged moth, (ii) dark-winged moth (C) - (i) use and disuse
- c) (A) - (i) spontaneous generation (B) - (i) dark-winged moth, (ii) white-winged moth
- d) (A) - (i) eternity of life (C) - (i) use and disuse
55. The tendency of population to remain in genetic equilibrium may be disturbed by
- a) Random mating b) Lack of migration c) Lack of mutations
- d) Lack of random mating
56. The homologous organs are those that show similarity in ____
- a) size b) origin c) function d) appearance
57. Half life period of C is about ____
- a) 500 years b) 5000 years c) 50 years d) 5×10^4 years
58. Two geographical regions separated by high mountains are ____.
- a) Oriental and Australian b) Palaearctic and Oriental c) Nearctic and palaearctic
- d) Neotropical and Ethiopian
59. At a particular locus, frequency of allele A is 0.6 and that of allele a is 0.4. What would be the frequency of heterozygotes in a random mating population at equilibrium?
- a) 0.36 b) 0.16 c) 0.24 d) 0.48
60. Replacement of the lighter-coloured variety of peppered moth (**Biston betularia**) to its darker variety (**Biston carbonaria**) in England is the example of:
- a) natural selection b) regeneration c) genetic isolation d) temporal isolation.
61. Evolutionary convergence is development of ____
- a) common set of characters in group of different ancestry
- b) dissimilar characters in closely related groups
- c) common set of characters in closely related groups d) random mating

62. Weismann cut off tails of mice generation after generation but tails neither disappeared nor shortened showing that_____
- a) Darwin was correct b) tail is an essential organ c) mutation theory is wrong
d) Lamarckism was wrong in inheritance of acquired characters
63. Who proposed that the first form of life could have come from pre-existing non-living organic molecules?
- a) S.L. Miller b) Oparin and Haldane c) Charles Darwin d) Alfred Wallace
64. An inter-breeding population of finches became separated geographically, forming two isolated groups. Each group then became subject to different selective pressures. One group was then introduced into the habitat of the other.
- Which one of the following would determine whether they now formed two distinct species?
- a) They had been separated for more than three million years.
b) They failed to produce fertile F_1 hybrids
c) They showed marked differences in the shape of their beaks.
d) Their plumage had become markedly different.
65. Viviparity is considered to be more evolved because
- a) the young ones are left on their own
b) the young ones are protected by a thick shell
c)
the young ones are protected inside the mother's body and are looked after they are born leading to more chances of survival
d) the embryo takes a long time to develop
66. The given graph shows the range of variation among population members for a trait determined by multiple genes. If this population is subjected to disruptive selection for several generations, which of the following distributions is most likely to result?



67. The extinct human ancestor, who ate only fruits and hunted with stone weapons was
- a) Ramapithecus b) Australopithecus c) Oryopithecus d) Homo erectus
68. The chronological order of human evolution from early to the recent is:
- a) Australopithecus ~> Ramapithecus ~> Homo habilis ~> Homo erectus
b) Ramapithecus ~> Australopithecus ~> Homo habilis ~> Homo erectus

- c) Ramapithecus ~> Homohabilis ~> Australopithecus ~> Homo erectus
d) Australopithecus ~> Homo habilis ~> Ramapithecus ~> Homo erectus
69. According to fossils discovered up to present time origin and evolution of man was started from _____
a) France b) Java c) Africa d) China
70. According to Hugo de Vries, the mechanism of evolution is _____
a) phenotypic variations b) saltation c) multiple step mutations d) minor mutations
71. Animal husbandry and plant breeding programmes are the examples of
a) reverse evolution b) artificial selection c) mutation d) natural selection
72. **Assertion:** Primitive atmosphere was of reducing type.
Reason: First hydrogen atoms combined with all oxygen.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
73. **Assertion:** Adaptive ability is inherited.
Reason: Fitness is the end result of the ability to adapt and get selected by the nature.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
74. According to one of the most widely accepted theories, earth's atmosphere before origin of life was
a) oxidising b) oxidising along with H_2 c) reducing with free O_2 in small amount
d) reducing with oxygen absent in O_2 form
75. Artificial selection to obtain cows yielding higher milk output represents:
a) stabilizing selection as it stabilizes this character in the population
b) directional as it pushes the mean of the character in one direction
c)
disruptive as it splits the population into two, one yielding higher output and the other lower output
d)
stabilizing followed by disruptive as it stabilizes the population to produce higher-yielding cows

76. In recent years, DNA sequences (nucleotide sequence) of mt-DNA and *Y* chromosomes were considered for the study of human evolution, because____
- a) they can be studied from the samples ce fossil rethains
 - b) they are small, and therefore, easy to study
 - c) they are uniparental in origin and do not take part in recombination
 - d) their structure is known in greater detail
77. Analogous organs arise due to
- a) divergent evolution
 - b) artificial selection
 - c) genetic drift
 - d) convergent evolution
78. Which of the following statements about natural selection are correct?
- (i) Tends to increase the characters that enhance survival and reproduction
 - (ii) Individuals with better adaptive ability leave more progeny
 - (iii) Was considered as mechanism of evolution by Darwin
- a) (i), (ii) and (iii)
 - b) (i) and (ii) only
 - c) (iii) only
 - d) (i) and (iii) only
79. In the developmental history of mammalian heart, it is observed that it passes through a two chambered fish like heart, three chambered frog like heart and finally four chambered stage.
- To which hypothesis can this above cited statement be approximated?
- a) Lamarck's principle
 - b) Mendelian principle
 - c) Biogenetic law
 - d) Hardy Weinberg law
80. Complete the following paragraph by selecting the correct sequence of words from the options given below. The Neanderthal man with a brain size of____(i)____ lived near East and Central ____ (ii) ____ between____ (iii) ____ years back. They used ____ (iv) ____ to protect their body and buried their dead.
- a)
- | i | ii | iii | iv |
|----------|-----------|-------------------|---------|
| 500 c.c. | Australia | 2,00,000-1,40,000 | clothes |
- b)
- | i | ii | iii | iv |
|----------|--------|--------------|-------|
| 900 c.c. | Africa | 40,000-8,000 | twigs |
- c)
- | i | ii | iii | iv |
|-----------|------|-----------------|-------|
| 1400 c.c. | Asia | 1,00,000-40,000 | hides |
- d)
- | i | ii | iii | iv |
|----------|--------|---------------|--------|
| 650 c.c. | Africa | 75,000-10,000 | leaves |
81. Read the following statements and select the correct option.
- (i) Increase in melanised moths after industrialisation in Great Britain is a proof for natural selection.
 - (ii) When more individuals of a population acquire a mean character value, it is called disruption.
 - (iii) Changes in allelic frequency in a population will lead to Hardy-Weinberg equilibrium.
 - (iv) Genetic drift changes the existing gene or allelic frequency in future generations.
- a) Only (ii) is correct
 - b) Only (iv) is correct
 - c) Both (i) and (iv) are correct.
 - d) Both (i) and (iii) are correct.
82. Which one of the following sets includes only the vestigial structures in man?

- a) Body hair olecranon process, coccyx, patella
 b) Wisdom teeth, mammary glands, coccyx, patella
 c) Coccyx, nictitating membrane, vermiform appendix, ear muscles
 d) Coccyx, body hair, ear ossicles, vermiform appendix
83. Which one does not favour Lamarckian concept of inheritance of acquired characters?
 a) Lack of pigment in cave dwellers b) Absence of limbs in snakes
 c) Presence of webbed toes in aquatic birds
 d) Melanization of peppered moth in industrial areas
84. Stabilising selection favours
 a) both extreme forms of a trait b) intermediate forms of a trait
 c) environmental differences
 d) one extreme form over the other extreme form and over intermediate forms of a trait.
85. Extremities, tail and ear are relatively shorter in animals living in cooler regions as compared to those inhabiting warmer zones. This is ____
 a) Bergman's rule b) Jordan's rule c) Gloger's rule d) Allen's rule
86. Which one of the following is incorrect about the characteristics of protobionts (coacervates and microspheres) as envisaged in the biogenic origin of life?
 a) They were able to reproduce.
 b) They could separate combinations of molecules from the surroundings.
 c) They were partially isolated from the surroundings.
 d) They could maintain an internal environment.
87. Theory of inheritance of acquired characters was given by ____
 a) Wallace b) Lamarck c) Darwin d) De Vries
88. Which of the following are the two key concepts of Darwinian theory of evolution?
 a) Genetic drift and mutation b) Adaptive radiation and homology
 c) Mutation and natural selection d) Branching descent and natural selection
89. The first life originated
 a) on land b) in air c) in water d) all of these
90. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Francesco Redi	(i) Theory of chemical evolution of life
B. L. Pasteur	(ii) Disproval of spontaneous generation
C. Richter	(iii) Swan necked flask experiment
D. Oparin	(iv) Mutation
	(v) Panspermia

- a) A-(v), B-(i), C-(iv), D-(ii) b) A-(ii), B-(iii), C-(v), D-(i) c) A-(v), B-(iv), C-(ii), D-(i)
 d) A-(i), B-(ii), C-(iii), D-(iv)

91. Which of the following refer to correct example(s) of organisms which have evolved due to changes of environment brought about by anthropogenic action ?

- (a) Darwin's Finches of Galapagos islands.
- (b) Herbicide resistant weeds
- (c) Drug resistant eukaryotes.
- (d) Man-created breeds of domesticated animals like dogs.

a) (b), (c) & (d) b) only (d) c) only (a) d) (a) & (c)

92. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Saltation	(i) Darwin
B. Formation of life was preceded by chemical evolution	(ii) Louis Pasteur
C. Reproductive fitness	(iii) de Vries
D. Life comes from pre-existing life	(iv) Oparin and Haldane

a)	b)	c)	d)
ABCD	ABCD	ABCD	ABCD
iii iv i ii	iv iii ii i	ii iii i iv	i iv iii ii

93. Fill up the blanks in the following paragraph by selecting the correct option.

When migration of a section of population to another place and population occurs, _____(i)_____ change in the original as well as in the new population. New genes/alleles are added to the _____(ii)_____ population and these are lost from the _____(iii)_____ population. There would be a _____(iv)_____ if this gene migration, happens multiple times. If the same change occurs by chance, it is called _____(v)_____. Sometimes the change in allele frequency is so different in the new sample of population that they become a different species. The original drifted population becomes founders and the effect is called _____(vi)_____.

a)

i	ii	iii	iv	v	vi
natural selection	new	old	gene flow	gene frequencies	founder effect

b)

i	ii	iii	iv	v	vi
gene frequencies	old	new	natural selection	gene flow	bottle neck effect

c)

i	ii	iii	iv	v	vi
gene frequencies	new	old	gene flow	genetic drift	founder effect

d)

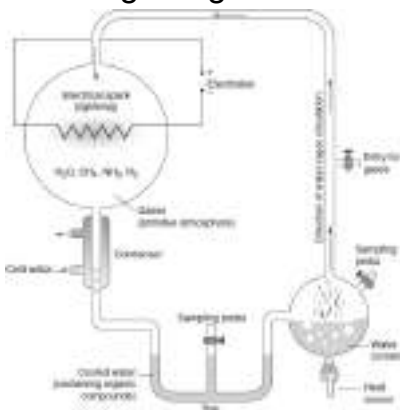
i	ii	iii	iv	v	vi
mutations	old	new	natural selection	gene flow	bottle neck effect

94. According to Darwin, The organic evolution is due to _____

- a) Interspecific competition b) Competition within closely related species
- c) Reduced feeding efficiency in one species d) Intraspecific competition

95. Which one of the following in birds, indicates their reptilian ancestry?

- a) Scales on their hind limbs b) Four-chambered heart
c) Two special chambers crop and gizzard in their digestive tract
d) Eggs, with a calcareous shell
96. Darwin in his 'Natural Selection Theory' did not believe in any role of which one of the following in organic evolution_____
- a) Discontinuous variations b) Parasites and predators as natural enemies
c) Survival of the fittest d) Struggle for existence
97. Which one of the following is a living fossil?
- a) *Pinus longifolia* b) *Dalbergia sissoo* c) *Mirabilis jalapa* d) *Ginkgo biloba*
98. Study of fossils is_____
- a) palaeontology b) herpetology c) saurology d) organic evolution
99. What is common between parrot, platypus and kangaroo?
- a) Toothless jaws b) Functional post-end tail c) Ovoparity d) Homeothermy
100. Parallelism is_____
- a) adaptive divergence b) adaptive divergence of widely separated species
c) adaptive convergence of widely different species
d) adaptive convergence of closely related groups
101. Which of the following isotopes is used for finding the fossil age maximum about 35,0000 years?
- a) ^{238}U b) ^{14}C c) ^3H d) ^{206}Pb
102. Golden age of reptiles was
- a) Proterozoic era b) Palaeozoic era c) Mesozoic era d) Coenozoic era
103. Which one of the following statements is correct?
- a) Cro-magnon man's fossil has been found in Ethiopia
b) *Homo erectus* is the ancestor of man
c) Neanderthal man is the direct ancestor of *Homo sapiens*
d) *Australopithecus* is the real ancestor of modern man
104. Convergent evolution is illustrated by_____
- a) dogfish and whale b) rat and dog c) bacterium and protozoan
d) starfish and cuttle fish
105. The diagram given here is the representation of



- a) Miller's experiment b) Redi's experiment c) Louis Pasteur's experiment
d) Spallanzani's experiment.
106. Industrial melanism as observed in peppered/moth proves that_____
- a) the true black melanic forms arise by a recurring random mutation
b)
the melanic form of the moth has no selective advantage over lighter form in industrial area
c)
the lighter-form moth has no selective advantage either in polluted industrial area or non-polluted area
d) melanism is a pollution-generated feature
107. An isolated population of humans with approximately equal numbers of blue-eyed and brown-eyed individuals was decimated by an earthquake. Only a few brown-eyed people remained to form the next generation. This kind of change in the gene pool is called a
- a) bottle-neck effect b) gene migration c) Hardy-Weinberg equilibrium
d) blocked gene flow
108. Jurassic period of the mesozoic era was characterised by_____ .
- a) Radiation of reptiles and origin of mammal-like reptiles
b) Dinosaurs become extinct and angiosperms appeared
c) Flowering plants and first dinosaurs appeared
d) Gymnosperms were dominant plants and first birds appeared
109. **Assertion:** Louis Pasteur showed that in flask open to air, new living organisms appeared in the heat killed yeast culture.
Reason: Life arise from pre-existing life
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
110. Thorn of Bougainvillea and tendril of cucurbita are example of_____ .
- a) analogous organ b) vestigial organs c) homologous organs
d) retrogressive evolution
111. Which of following is closest relative of man?
- a) Chimpanzee b) Gorilla c) Orangutan d) Gibbon
112. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Wallace	(i) Essay on population
B. Malthus	(ii) Biston
C. Hardy-Weinberg law	(iii) $p^2 + q^2 + 2pq = 1$

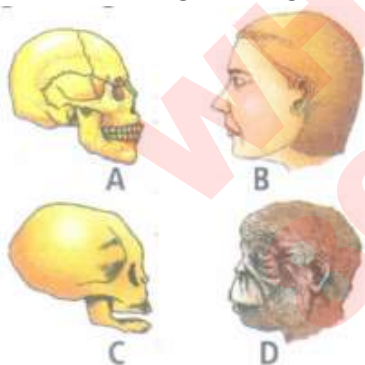
Column I	Column II																
D. Industrial melanism	(iv) Co-proposer of Natural selection																
a)	b)																
<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>iii</td><td>iv</td><td>ii</td><td>i</td></tr></table>	A	B	C	D	iii	iv	ii	i	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>ii</td><td>i</td><td>iv</td><td>iii</td></tr></table>	A	B	C	D	ii	i	iv	iii
A	B	C	D														
iii	iv	ii	i														
A	B	C	D														
ii	i	iv	iii														
c)	d)																
<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>iv</td><td>i</td><td>ii</td><td>iii</td></tr></table>	A	B	C	D	iv	i	ii	iii	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>iv</td><td>i</td><td>iii</td><td>ii</td></tr></table>	A	B	C	D	iv	i	iii	ii
A	B	C	D														
iv	i	ii	iii														
A	B	C	D														
iv	i	iii	ii														

113. What was the most significant trend in evolution of modern man (*Homo sapiens*) from his ancestors?
- a) Upright posture b) Shortening of jaws c) Binocular vision
d) Increasing brain capacity
114. Which of the following had the smallest brain capacity?
- a) *Homo sapiens* b) *Homo neanderthalensis* c) *Homo habilis* d) *Homo erectus*
115. The extinct humans who lived 1,00,000 to 40,000 years ago, in East and Central Asia, used hides to protect their bodies and had brain capacity of 1400 c.c. were
- a) *Homo habilis* b) Neanderthal man c) Cro-Magnon man d) *Ramapithecus*
116. In evolution, the studies can be made at molecular level. For example, the proteins present in the blood of man and ape are similar. The base sequence in nucleic acids and amino acids sequence in proteins of related organism is alike. These are the examples which are specifically referred to in:
- a) convergent evolution b) molecular analogy c) molecular homology
d) homoplastic appearance
117. 'Origin of species' was written by _____
- a) Oparin b) Weismann c) Lamarck d) Darwin
118. From the point of view of early chemical evolution that preceded the origin of life on earth, the most important simple organic molecules formed were
- a) sugars and amino acids b) glycerol and fatty acids c) purines and pyrimidines
d) all of these.
119. What kind of evidences suggested that man is more closely related with chimpanzee than with other hominoid apes?
- a) Evidence from DNA of sex chromosomes only
b) Comparison of chromosome morphology and number
c) Evidence from fossil remains, and the fossil mitochondrial DNA alone
d) Evidence from banding pattern of chromosome 3 and 6
120. Allopatric speciation occurs when
- a) genetically related populations inhabit widely separated geographical area
b) genetically unrelated populations inhabit widely separated geographical area
c) genetically related populations inhabit the same geographical area
d) genetically unrelated populations inhabit the same geographical area.
121. Analogous structures are a result of:

- a) Convergent evolution b) Shared ancestry c) Stabilizing selection
d) Divergent evolution
122. Presence of gills in the tadpole of frog indicates that
a) fishes were amphibious in the past b) fishes evolved from frog-like ancestors
c) frogs will have gills in future d) frogs evolved from gilled ancestors.
123. The character that proves that frogs have evolved from fishes is
a) their ability to swim in water b) tadpole larva in frogs
c) similarity in the shape of the head d) their feeding on aquatic plants.
124. Evolution of different species in a given area starting from a point and spreading to other geographical areas is known as_____
a) Adaptive radiation b) Natural selection c) Migration d) Divergent evolution
125. Identify the correct sequence in which the following substances have appeared during the course of evolution of life on earth_____
a) glucose, amino acids, nucleic acids, proteins
b) ammonia, amino acids, proteins, nucleic acids
c) water, amino acids, nucleic acids, enzymes
d) amino acids, ammonia, phosphates, nucleic acids
126. Consider the following three statements and select the correct option stating which one is true (T) and which one is false (F).
- (i) Oparin of Russia and Haldane of England proposed that the first form of life could have come from pre-existing non-living organic molecules (e.g., RNA, protein, etc.) and that formation of life was preceded by chemical evolution.
- (ii) Based on observations made during a sea voyage around the world, Charles Darwin concluded that existing living forms share similarities to varying degrees only among themselves.
- (iii) Evolution by natural selection must have started when cellular forms of life with different metabolic capability originated on Earth.
- | a) | b) | c) | d) |
|--------------|--------------|--------------|--------------|
| (i)(ii)(iii) | (i)(ii)(iii) | (i)(ii)(iii) | (i)(ii)(iii) |
| F T T | T F T | T T F | F F T |
127. **Assertion:** Evolutionary trend is continuous changes of character in a lineage.
Reason: Lineage is an evolutionary sequence arranged in linear order.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
128. Among the human ancestors the brain size was more than 1000 cc in_____
a) Homo erectus b) Ramapithecus c) Homo habilis d) Homo neanderthalensis

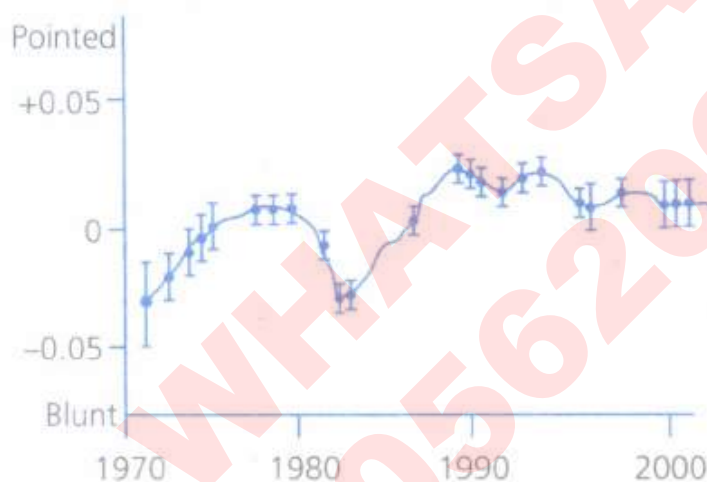
129. Read the given statements and select the correct ones.
- (i) Swan-necked flask experiment was done by Louis Pasteur.
 - (ii) The early belief of the spontaneous origin of life was disproved by Louis Pasteur.
 - (iii) Louis Pasteur is famous for germ theory of diseases.
 - (iv) The idea that life originates from pre-existing life is referred to as biogenesis theory.
 - (v) Father Suarez was one of the greatest supporter of theory of special creation.
 - (vi) Cosmozoic theory of the origin of life was proposed by Richter.
 - (vii) The founder of 'theory of catastrophism' is Georges Cuvier.
- a) (i), (ii), (iv) and (vi) b) (ii), (v) and (vii) c) (iii), (iv), (v) and (vii)
d) (i), (ii), (iii), (iv), (v), (vi), (vii)
130. The concept of chemical evolution is based on_____
- a) interaction of water, air and clay under intense heat.
 - b) effect of solar radiation on chemicals
 - c) possible origin of life by combination of chemicals under suitable environmental conditions
 - d) crystallization of chemicals
131. Select the correct statement from the following?
- a) Fitness is the end result of the ability to adapt and get selected by nature
 - b) All mammals except whales and camels have seven cervical vertebrae
 - c) Mutations are random and directional
 - d) Darwinian variations are small and directionless
132. Which was absent in the atmosphere at the time of origin of life?
- a) NH_3 b) H_2 c) O_2 d) CH_4
133. The earliest fossil form in the phylogeny of horse is_____
- a) Merychippus b) Meshippus c) Ehippus d) Equus
134. Each of us is part of the ongoing evolution of the species. Which of the following occurrences would have the greatest impact on the future biological evolution of the human population?
- a) A mutation occurs in one of your sperm or egg cells.
 - b) You do exercise every day so that you stay physically fit and healthy.
 - c) You move to Kerala, the state of highest medical facilities and literacy.
 - d) You encourage your children to develop their intellectual abilities.
135. Which of the following is an example for link species?
- a) Lung fish b) Dodo bird c) Seaweed d) Chimpanzee
136. Read the following statements carefully and select the correct ones.
- (i) Alfred Wallace, a naturalist who worked in Malay Archipelago had also come to similar conclusions as Darwin around the same time.
 - (ii) August Weismann by careful experimentation demonstrated that life comes only from pre-existing life.

- (iii) The organs which have the same fundamental structure but are different in functions are called homologous organs.
- (iv) Rate of appearance of new form is inversely proportional to lifespan of organism.
- a) (i) and (iii) b) (i) and (ii) c) (ii) and (iv) d) (iii) and (iv)
137. The most apparent change during the evolutionary history of **Homo sapiens** is traced in
a) loss of body hair b) walking upright c) shortening of the jaws
d) remarkable increase in the brain size
138. The ship used by Charles Darwin during his sea voyages was
a) HMS Beagle b) HSM Beagle c) HMS Eagle d) HSM Eagle.
139. Which of the following is the correct sequence of events in the origin of life?
(I) Formation of protobionts
(II) Synthesis of organic monomers
(III) Synthesis of organic polymers
(IV) Formation of DNA-based genetic systems
a) I, II, III, IV b) I, III, II, IV c) II, III, I, IV d) II, III, IV, I
140. Which one of the following are analogous structures?
a) Wings of Bat and Wings of Pigeon b) Gills of Prawn and Lungs of Man
c) Thorns of Bougainvillea and Tendrils of Cucurbita
d) Flippers of Dolphin and Legs of Horse
141. Refer to the given figure.



- The given figures represents that
a) the skull of baby chimpanzee is more like adult human skull.
b) he baby chimpanzee did not have teeth whereas humans do
c) sutures are present on the skull of adult human whereas in chimpanzee it is a single bone.
d) both (a) and (c).
142. Flippers of Penguins and Dolphins are examples of _____
a) Industrial melanism b) Natural selection c) Adaptive radiation
d) Convergent evolution
143. Which one of the following correctly describes the homologous structures?

- a) Organs with anatomical similarities, but performing different functions.
 - b) Organs with anatomical dissimilarities, but performing same function.
 - c) Organs that have no function now, but had an important function in ancestors.
 - d) Organs appearing only in embryonic stage and disappearing later in the adult.
144. According to Oparin, which one of the following was not present in the primitive atmosphere of the earth_____
- a) Methane b) Oxygen c) Hydrogen d) Water vapour
145. $(p+q)^2 = p^2 + 2pq + q^2 = 1$ represents an equation used in
- a) population genetics b) Mendelian genetics c) biometrics d) molecular genetics
146. Homologous organs are_____
- a) wings of insects and bat b) gills of fish and lungs of rabbit
- c) pectoral fins of fish and fore limbs of horse d) wings of grasshopper and crow
147. In order to build a longitudinal dataset, data of adult finches *Geospiza fortis* living on one of the Galapagos islands were collected. The beak shape data collected between 1971-2001 are shown in the graph.



Study the graph and select the correct statement.

- a) The fluctuating direction in the beak shape is most probably due to change in the environment.
 - b) The graph as a whole does not indicate evolutionary change in the beak shape as the time interval is too small and evolution requires thousands of years to occur.
 - c) The graph indicates that the beak shape may lead to convergent evolution in the finches of Galapagos islands.
 - d) The change in any phenotypic character requires selection to alter the expression of large number of genes in coordinated fashion. Hence, it is unlikely that change in the beak shape depicted in the graph is a result of evolution.
148. Which one of the following is regarded as the direct ancestor of modern man?

- a) Homo erectus b) Ramapithecus c) Homo habilis d) Cro-magnon man
149. "Human population grows in geometric ratio while food materials increase in arithmetic proportion." It is a statement from
a) Darwin b) Bateson c) Amartya Sen d) Malthus
150. One of the oldest, best preserved and most complete hominid fossil commonly known as 'Lucy' belongs to the genus:
a) Australopithecus b) Oreopithecus c) Dryopithecus d) Pithecanthropus
151. Diversification in plant life appeared _____
a) due to long periods of evolutionary changes b) due to abrupt mutations
c) suddenly on earth d) by seed dispersal
152. Given below are four statements (A-D) each with one or two blanks. Select the option which correctly fills up the blanks in two statements.
(A) Wings of butterfly and birds look alike and are the results of ____ (i) ____ evolution.
(B) Miller showed that CH_4 , H_2 , NH_3 and ____ (i) ____ when exposed to electric discharge in a flask resulted in formation of ____ (ii) ____
(C) Vermiform appendix is a ____ (i) ____ organ and an ____ (ii) ____ evidence of evolution.
(D) According to Darwin, evolution took place due to ____ (i) ____ and ____ (ii) ____ of the fittest.
a) (A)-(i) convergent; (D)-(i) small variations, (ii) survival
b) (A)-(i) convergent; (B)-(i) oxygen, (ii) nucleosides
c) (B)-(i) water vapour, (ii) amino acids; (C)-(i) homologous, (ii) anatomical
d) (C)-(i) vestigial, (ii) anatomical; (D)-(i) mutations, (ii) multiplication
153. There is no life on moon due to the absence of _____
a) O_2 b) water c) light d) temperature
154. **Assertion:** Disruptive selection changes the population towards one particular direction.
Reason: This type of selection favours average sized individuals.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
155. The given figure shows an example of



- a) homologous organs b) convergent evolution c) divergent evolution
d) both (a) and (c)
156. In a random mating population in equilibrium, which of the following brings about a change in gene frequency in a non-directional manner?
a) Migration b) Mutations c) Random drift d) Selection
157. Evolution is _____
a) progressive development of a race
b) history and development of race along with variations c) history of race
d) development of race
158. Coacervates are
a) colloid droplets b) nucleoprotein containing entities c) microspheres
d) both (a) and (b)
159. Which one is irrelevant to evolution of man?
a) Perfection of hand for tool making
b) Change of diet from hard nuts/roots to soft food
c) Increased ability to communicate or develop community behaviour d) Loss of tail
160. In the case of peppered moth the black-coloured form became dominant over the light-coloured form in England during industrial revolution.
This is an example of _____
a) appearance of the darker coloured individuals due to very poor sunlight
b) protective mimicry
c) inheritance of darker colour character acquired due to the darker environment
d) natural selection whereby the darker forms were selected
161. There are two opposing views about origin of modern man, According to one view Homo erectus in Asia were the ancestors of modern man. A study of variation of DNA however suggested African origin of modern man. What kind of observation on DNA, variation could suggest this?
a) Greater variation in Asia than in Africa b) Greater variation in Africa than in Asia
c) Similar variation in Africa and Asia d) Variation only in Asia and no variation in Africa
162. Forelimbs of cat, lizard used in walking; forelimbs of whale used in swimming and forelimbs of bats used in flying are an example of _____.
a) Analogous organs b) Adaptive radiation c) Homologous organs
d) Convergent evolution
163. Frequency of an allele in a isolated population may change due to _____.
a) genetic Drift b) gene flow c) mutation d) natural selection
164. 'Continuity of germplasm' theory was given by _____.
a) De Vries b) Weismann c) Darwin d) Lamarck
165. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by:
a) p^2 b) $2pq$ c) pq d) q^2
166. Which of the following differences between Lamarckism and Darwinism is incorrect?

a)

Lamarckism	Darwinism
It does not consider struggle for existence	Struggle for existence is very important in this theory.

b)

Lamarckism	Darwinism
Only useful variations are transferred to the next generation.	All the acquired characters are inherited to the next generation.

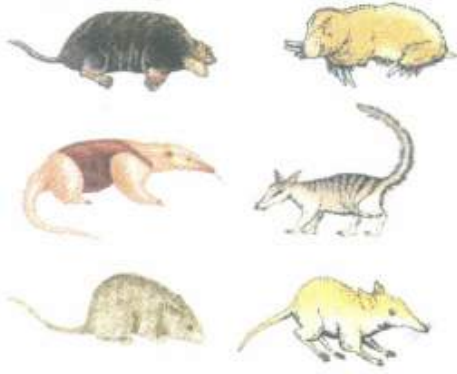
c)

d) None of these

Lamarckism	Darwinism
Neglects survival of the fittest.	Based on survival of the fittest.

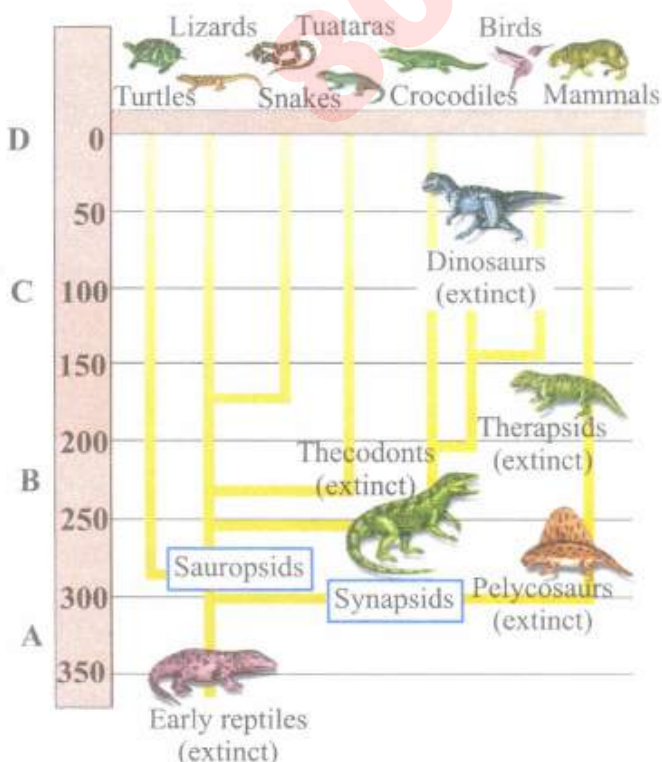
167. Which type of selection is industrial melanism observed in moth, *Biston betularia*?
a) Stabilising b) Directional c) Disruptive d) Artificial
168. The theory of natural selection was given by
a) Lamarck b) Alfred Wallace c) Charles Darwin d) Oparin and Haldane.
169. *Homo sapiens* arose during which epoch?
a) Pleistocene b) Pliocene c) Oligocene d) Holocene
170. Which one of the following scientist's name is correctly matched with the theory put forth by him?
a) de Vries - Theory of natural selection b) Darwin - Theory of pangenesis
c) Weismann - Theory of continuity of germ plasma
d) Pasteur - Theory of inheritance of acquired characters
171. **Assertion:** Hardy-Weinberg principle explains the variations occurring in population and species over a number of generations.
Reason: Hardy-Weinberg principle is applicable only when genetic drift occurs.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
172. Random genetic drift in a population probably results from _____
a) large population size b) highly genetically variable individuals
c) interbreeding within this population d) constant low mutation rate

173. Refer to the given figure.



The organisms in the given figure represent

- a) divergent evolution b) convergent evolution c) connecting links d) recapitulation.
174. Darwinism finches are an excellent example of _____
a) adaptive radiation b) seasonal migration c) brood parasitism d) connecting links
175. Fitness according to Darwin refers to
a) number of species in a community b) useful variation in population
c) strength of an individual d) reproductive fitness of an organism
176. Study of human evolution is called
a) archaeology b) anthropology c) pedigree analysis d) chronobiology
177. The diversity in the type of beaks of finches adapted to different feeding habits on the Galapagos Islands, as observed by Darwin, provides evidence for
a) intraspecific competition b) interspecific competition
c) origin of species by natural selection d) origin of species by mutation.
178. Following is given the diagrammatic representation of evolutionary history of vertebrates through geological periods. Identify the geological periods (A, B, C and D) and select the correct option.



a)

A	B	C	D
Carboniferous	Triassic	Cretaceous	Quaternary

b)

A	B	C	D
Jurassic	Permian	Tertiary	Cretaceous

c)

A	B	C	D
Permian	Jurassic	Quaternary	Tertiary

d)

A	B	C	D
Cretaceous	Quaternary	Carboniferous	Jurassic

179. Common origin of man and chimpanzee is best shown by ____
 a) banding pattern in chromosomes number 3 and 6 b) cranial capacity
 c) binocular vision d) dental formula
180. Which is the correct order of increasing geological timescale for a hypothetical vertebrate evolution?
 a) Cenozoic, Mesozoic, Palaeozoic, Proterozoic
 b) Cenozoic, Palaeozoic, Mesozoic, Proterozoic
 c) Proterozoic, Cenozoic, Palaeozoic, Mesozoic
 d) Proterozoic, Palaeozoic, Mesozoic, Cenozoic
181. The bones of forelimbs of whale, bat, cheetah, and man are similar in structure, because
 a) one organism has given rise to another b) they share a common ancestor
 c) they perform the same function d) they have biochemical similarities.
182. First life form on earth was a
 a) cyanobacterium b) chemoheterotroph c) autotroph d) photoautotroph
183. Variations during mutations of meiotic recombinations are
 a) random and direction less b) random and directional c) random and small
 d) random, small and directional.
184. What can you infer about the structures shown in figure?



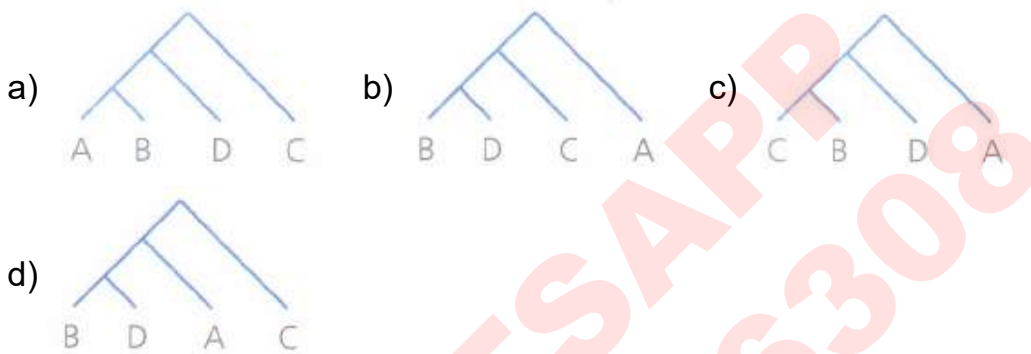
- a) They are homologous structures. b) They are vestigial structures.
 c) They are analogous structures. d) They have nothing to do with each other.
185. Palaeontological evidences for evolution refer to the
 a) development of embryo b) homologous organs c) fossils d) analogous organs
186. Alfred Wallace worked in
 a) Galapagos Island b) Australian Island Continent c) Malay Archipelago
 d) none of these
187. Sequence of which of the followings is used to know the phylogeny?

- a) mRNA b) rRNA c) tRNA d) DNA
188. From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask _____
- a) CH_4 , H_2 , NH_3 and water vapor at 600°C
b) CH_3 , H_2 , NH_3 and water vapor at 600°C
c) CH_4 , H_2 , NH_3 and water vapor at 800°C
d) CH_3 , H_2 , NH_4 and water vapor at 800°C
189. Which is not a vestigial organ in man?
- a) Nictitating membrane b) Tail vertebrae c) Vermiform appendix d) Nails
190. On the primitive earth, polymers such as proteins and nucleic acids in aqueous suspension formed the spherical aggregates. These are called
- a) primitosomes b) liposomes c) primitogens d) coacervates
191. **Assertion:** Founder effect may lead to formation of new species.
Reason: Founders carry all the parental gene pool to a new location
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
192. The sequence of origin of life may be
- a) Inorganic materials \rightarrow Organic materials \rightarrow Colloidal aggregate \rightarrow Eobiont \rightarrow Cell
b) Organic materials \rightarrow Inorganic materials \rightarrow Colloidal aggregate \rightarrow Eobiont \rightarrow Cell
c) Inorganic materials \rightarrow Organic materials \rightarrow Eobiont \rightarrow Cell \rightarrow Colloidal aggregate
d) Organic materials \rightarrow Inorganic materials \rightarrow Eobiont \rightarrow Cell \rightarrow Colloidal aggregate.
193. The most accepted line of descent in human evolution is
- a) Australopithecus \rightarrow Ramapithecus \rightarrow Homo sapiens \rightarrow Homo habilis
b) Homo erectus \rightarrow Homo habilis \rightarrow Homo sapiens
c) Ramapithecus \rightarrow Homo habilis \rightarrow Homo erectus \rightarrow Homo sapiens
d)
Australopithecus \rightarrow Ramapithecus \rightarrow Homo erectus \rightarrow Homo habilis \rightarrow Homo sapiens.
194. The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge, is called _____
- a) Convergent evolution b) Non-random evolution c) Adaptive radiation
d) Natural selection
195. The cranial capacity was largest among the
- a) Peking man b) Java ape man c) African man d) Neanderthal man
196. The different forms of interbreeding species that live in different geographical regions are called

- a) sibling species b) sympatric species c) allopatric species d) polytypic species

197. Following table shows data on amino acid substitution in the a chain of haemoglobin in four different mammalian species A, B, C and D. On the basis of the data shown in the table, choose the most appropriate evolutionary tree from those given below.

Comparison of Species	Number of Amino Acid Substitution
A and B	19
B and C	26
A and C	27
D and C	27
A and D	20
D and B	1



198. Abiogenesis theory of origin supports

- a) spontaneous generation b) origin of life from blue-green algae
c) origin of life is due to pre-existing organisms
d) organic evolution is due to chemical reactions

199. The factors involved in the formation of new species are:

- a) isolation and competition b) gene flow and competition
c) competition and mutation d) isolation and variation.

200. One of the possible early sources of energy was/were

- a) CO₂ b) chlorophyll c) green plants d) UV rays and lightning.

201. Select the pair which does not match.

- a) Coacervates-Aggregates of organic compounds separated by an organic membrane
b) Lamarck -Species are not immutable c) Allopatric speciation -Separated by space
d) Darwin's finches-Unique to Galapagos

202. Which of the following evidences does not favour the Lamarckian concept of inheritance of acquired characters?

- a) Lack of pigment in cave-dwelling animals b) Melanisation in peppered moth
c) Absence of limbs in snakes d) Presence of webbed toes in aquatic birds

203. **Assertion:** Genetic drift refers to changes in the allele frequency occurring by chance.

Reason: Sampling errors often lead to the elimination of certain alleles and fixation of others, reducing genetic variability.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

204. Identify the correct arrangement of periods of Palaeozoic era in ascending order in geological timescale.

a) Cambrian → Devonian → Ordovician → Silurian → Carboniferous → Permian

b) Cambrian → Ordovician → Silurian → Devonian → Carboniferous → Permian

c) Cambrian → Ordovician → Devonian → Silurian → Carboniferous → Permian

d) Silurian → Devonian → Cambrian → Ordovician → Permian → Carboniferous

205. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Mutation	(i) Changes in population's frequencies due to chance alone
B. Gene flow	(ii) Differences in survival and reproduction among variant individuals
C. Natural selection	(iii) Immigration, emigration change allele frequencies
D. Genetic drift	(iv) Source of new alleles

a)

A	B	C	D
i	ii	iii	iv

b)

A	B	C	D
iv	ii	iii	i

c)

A	B	C	D
v	i	iv	ii

d)

A	B	C	D
iv	iii	ii	i

206. The extinct human who lived 1,00,000 to 40,000 years ago, in Europe, Asia and parts of Africa with short stature, heavy eyebrows, retreating foreheads, large jaws with heavy teeth, stocky bodies, a Wembering gait and stooped posture was:

a) Homo habilis b) Cro-magnon humans c) Neanderthal human d) Ramapithecus

207. **Assertion:** Neanderthal man is the intermediate between **Ramapithecus** and **Homo erectus**.

Reason: Neanderthal man, with brain size of 800 c.c., used hides to protect their body.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

208. Refer to the given statements and select the correct ones.

(i) Fossils are remains of hard parts of life forms in rocks.

(ii) Dinosaurs disappeared about 65 mya.

(iii) Animals called lobe fins evolved into reptiles.

(iv) Study of fossils is called palaeontology.

a) (i), (ii) and (iv) b) (ii) and (iv) c) (i), (iii) and (iv) d) None of these

209. Given below are four statements (i) - (iv) regarding geological time scale. Read them carefully

- (i) Palaeozoic era is the era of ancient life.
- (ii) Ordovician period is the age of vertebrates.
- (iii) Carboniferous period is the age of reptiles
- (iv) Proterozoic era is the era of early life.

Which of the above two statements are incorrect?

- a) (i) and (iv) b) (ii) and (iii) c) (ii) and (iv) d) (i) and (iii)

210. Similarities in organism with different genotype indicates_____ .

- a) Micro evolution b) Macro evolution c) Convergent evolution
d) Divergent evolution

211. Evolution of life shows that life forms had a trend of moving from

- a) land to water b) dryland to wet land c) fresh water to sea water d) water to land

212. Single step large mutation leading to speciation is also called

- a) founder effect b) saltation c) branching descent d) natural selection

213. In the experiment in given diagram which of the following groups of gases were used to simulate primitive atmosphere?



- a) N_2 , H_2 , CH_4 , C_2H_6 b) NH_3 , H_2O , CH_4 , H_2 c) N_2O , H_2O , NO_2 , SO_2
d) CH_4 , H_2 , NO_2 , SO_2

214. In a large, randomly mating population, only one person in 10,000 is an albino, What will be the frequency of a carrier person of albinism?

- a) 1 in 50 b) 99 in 10000 c) 2 in 10000 d) 1 in 100

215. Match the scientists listed under Column 'A' with ideas listed under Column 'B'.

Coulmn A		Column B	
A.	Darwin	(i)	Abiogenesis
B.	Oparin	(ii)	Use and disuse of organs
C.	Lamarck	(iii)	Continental drift theory
D.	Wagner	(iv)	Evolution by natural selection

- a) A-(i); B-(iv); C-(ii); D-(iii) b) A-(iv); B-(i); C-(ii); D-(iii) c) A-(ii); B-(iv); C-(iii); D-(i)
d) A-(iv); B-(iii); C-(ii); D-(i)

216. Theory of natural selection dwells on_____

- a) role of environment in evolution b) natural selection acting on favourable variations
c) changes in gene complex resulting in heritable variations d) None of the above
217. In 1953, S. L. Miller created primitive earth conditions in the laboratory and gave experimental evidence for origin of first form of life from pre-existing non-living organic molecules. The primitive earth conditions created include
a) low temperature, volcanic storms, atmosphere rich in oxygen
b) low temperature, volcanic storms, reducing atmosphere
c) high temperature, volcanic storms, non-reducing atmosphere
d) high temperature, volcanic storms, reducing atmosphere containing CH_4 , NH_3 , etc.
218. Match the hominids with their correct brain size____
(A) Homo habilis - (i) 900 cc
(B) Homo - (ii) 1350cc neanderthalensis
(C) Homo erectus - (iii) 650-800 cc
(D) Homo sapiens - (iv) 1400cc
Select the correct option.
a) (iii),(ii),(i),(iv) b) (iii),(iv),(i),(ii) c) (iv),(iii),(i),(ii) d) (iii),(i),(iv),(ii)
219. Peripatus is a connecting link between____
a) Mollusca and Echinodermata b) Annelida and Arthropoda
c) Coelenterata and Porifera d) Ctenophora and Platyhelminthes
220. Which one of the following sequences was proposed by Darwin and Wallace for organic evolution?
a) Variations, natural selection, overproduction, constancy of population size
b) Overproduction, variations, constancy of population size, natural selection
c) Variations, constancy of population size, overproduction, natural selection
d) Overproduction, constancy of population size, variations, natural selection
221. Genetic drift operates only in____
a) smaller populations b) larger populations c) Mendelian populations
d) island populations
222. Which of the following are necessary for evolution by natural selection to take place?
(i) Offspring resemble their parents more than other individuals in the population.
(ii) Differences among individuals exist and lead to different numbers of successful offspring being produced.
(iii) Individuals adjust their development depending on the environment
(iv) Every individual possess enormous fertility.
a) (i) and (ii) b) (ii) and (iv) c) (i), (iii) and (iv) d) (iii) only
223. Darwin's finches are a good example of____
a) Industrial melanism b) Connecting link c) Adaptive radiation
d) Convergent evolution
224. Amphibians were dominant during _____period.
a) Carboniferous b) Silurian c) Ordovician d) Cambrian

225. Two different species can not live for long duration in the same niche or habitat. This law is_____
- a) Allen's law b) Gause's hypothesis c) Dollo's rule d) Weisman's theory
226. The age of the fossil of Dryopithecus on the geological time scale is_____.
- a) 5×10^6 yr back b) 25×10^6 yr yr back c) 50×10^6 yr back
d) 75×10^6 yr back
227. Frequency of a character increases when it is_____
- a) recessive b) dominant c) inheritable d) adaptable
228. Which of the following eras, in geological time scale, corresponds to the period when life had not originated upon the earth?
- a) Azoic b) Palaeozoic c) Mesozoic d) Archaeozoic
229. Which one of the following is not a living fossil?
- a) Sphenodon b) Archaeopteryx c) Peripatus d) King crab
230. Which one of the following is incorrect about the characteristics of protobionts (coacervates and microspheres) as envisaged in the abiogenic origin of life?
- a) They were partially isolated from the surroundings.
b) They could maintain an internal environment.
c) They were able to reproduce sexually.
d) They could separate combinations of molecules from the surroundings.
231. In general, in the developmental history of a mammalian heart, it is observed that it passes through a two for? chambered fish-like heart, three-chambered frog-like heart and finally to four-chambered stage. To which hypothesis can this above cited statement be approximated?
- a) Hardy-Weinberg law b) Lamarck's principle c) Biogenetic law
d) Mendelian principles
232. Occurrence of endemic species in South America and Australia is due to_____
- a) These species have been extinct from other regions b) Continental separation
c) There is no terrestrial route to these places d) Retrogressive evolution
233. **Assertion:** Moths living in the industrial areas became dark to match body colour to the tree trunks.
- Reason:** Smoke from industries covers the moths, making them appear dark.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
234. When two species of different genealogy come to resemble each other as a result of adaptation, the phenomenon is termed_____
- a) microevolution b) co-evolution c) convergent evolution d) divergent evolution

235. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Edward Lewis	(i) Australopithecus
B. L.S.B. Leakey	(ii) Homo neanderthalensis
C. C. Fuhlrott	(iii) Homo habilis
D. Raymond Dart	(iv) Ramapithecus

- a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(ii), B-(i), C-(iv), D-(iii) c) A-(iii), B-(ii), C-(i), D-(iv)
d) A-(i), B-(ii), C-(iii), D-(iv)

236. Adaptive radiation refers to _____

- a) evolution of different species from a common ancestor
b) migration of members of a species to different geographical areas
c) power of adaptation in an individual to a variety of environments
d) adaptations due to geographical isolation

237. Humming birds and hawk illustrate _____

- a) convergent evolution b) homology c) adaptive radiation d) parallel evolution

238. The eye of octopus and eye of cat show different patterns of structure, yet they perform similar function. This is an example of _____

- a) Homologous organs that have evolved due to divergent evolution
b) Analogous organs that have evolved due to convergent evolution
c) Analogous organs that have evolved due to divergent evolution
d) Homologous organs that have evolved due to convergent evolution

239. The correct sequence for the manufacture of the compounds on the primitive earth is

- a) NH_3 , CH_4 , protein and carbohydrate
b) protein, carbohydrate, water and nucleic acid
c) NH_3 , CH_4 , carbohydrate and nucleic acid
d) NH_3 , carbohydrate, protein and nucleic acid.

240. Which one of the following statements about fossil human species is correct?

- a) Fossils of Homo neanderthalensis have been found recently in South America
b) Neanderthal man and Cro-magnon man did exist for sometime together
c) Australopithecus fossils have been found in Australia
d) Homo erectus was preceded by Homo habilis

241. If the Neanderthals are not the direct ancestors of humans, is it still possible for humans and Neanderthals to be related?

- a) Yes, because we share a common ancestor
b) Yes, but only if humans and Neanderthals could have interbred
c) No, because the human evolutionary tree is strictly linear and without branches.
d)

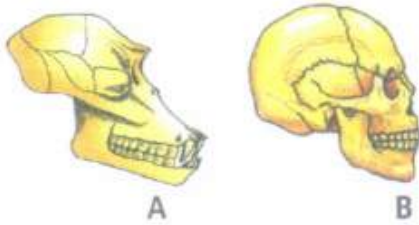
No, because this means that Neanderthals evolved from an entirely different branch of organisms than humans did.

242. Following diagram provides an example of



- a) convergent evolution b) parallel evolution c) recapitulation
d) divergent evolution.
243. Appearance of antibiotic-resistant bacteria is an example of
a) adaptive radiation b) transduction c) pre-existing variation in the population
d) divergent evolution
244. Which of the following structures is homologous to the wing of a bird?
a) Wing of a moth b) Hind limb of rabbit c) Flipper of whale d) Dorsal fin of a shark
245. Which one of the following phenomena supports Darwin's concept of natural selection in organic evolution?
a) Development of transgenic animals b) Production of 'Dolly', the sheep by cloning
c) Prevalence of pesticide resistant insects
d) Development of organs from 'stem cells' for organ transplantation
246. **Assertion:** Evolution is not a directed process in sense of determinism
Reason: Evolution is a stochastic process based on chance events in nature and chance mutation in the organisms.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
247. In which era reptiles were dominant?
a) Coenozoic era b) Mesozoic era c) Palaeozoic era d) Archaeozoic era
248. The Hardy-Weinberg principle cannot operate if
a) a population does not migrate for a longtime to a new habitat.
b) frequent mutations occur in the population
c) the population has no chance of interaction with other populations
d) free interbreeding occurs among all members of the population.

249. The diagram given here shows the skulls of two different mammals.



Which of the following accurately describes the differences between these skulls?

- a) Skull A has more teeth than skull B. b) Skull A has more brain capacity than skull B.
 - c) Skull A is of a human and skull B is of an ape
 - d) Skull A is of an ape and skull B is of human
250. Consider following statements regarding microspheres.
- (i) They were spherical in shape and 1-2 μm in diameter.
 - (ii) They had concentric double-layered boundaries.
 - (iii) They could grow in size but were not able to reproduce.
 - (iv) They used ATP as source of energy.
- Which of the above statements is/are incorrect?
- a) (i) only b) (ii) only c) (iii) only d) none of these
251. Read the given statements (i)-(iv) regarding evolution and select the incorrect ones.
- (i) The oceanic water rich in mixture of organic compounds was termed by J.B.S. Haldane (1920) as 'hot dilute soup of organic substances'.
 - (ii) The term coacervate was given by Sydney Fox.
 - (iii) First cellular form of life did not possibly originate till about 2000 mya.
 - (iv) The first geological time scale was developed by Georges Cuvier.
- a) (ii) and (iv) b) (i) and (ii) c) (ii) and (iii) d) (iii) and (iv)
252. The prebiotic atmosphere of the earth was of a reducing nature. It was transformed into an oxidising atmosphere of present day due to the emergence of
- a) cyanobacteria b) angiosperms c) photosynthetic protists d) eukaryotic algae
253. Hardy-Weinberg equilibrium is known to be affected by gene flow, genetic drift, mutation, genetic recombination and
- a) evolution b) limiting factors c) saltation d) natural selection.
254. The theory of spontaneous generation stated that
- a) life arose from living forms only b) life can arise from both living and non-living
 - c) life can arise from non-living things only
 - d) life arises spontaneously, neither from living nor from the non-living.
255. Phenomenon of 'industrial melanism' demonstrates:
- a) geographical isolation. b) reproductive isolation. c) natural selection.
 - d) induced mutation.
256. **Assertion:** The embryos of fish, salamander, tortoise, chick and a man, of same age resemble one another closely.
- Reason:** Ontogeny recapitulates phylogeny.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

257. Animals have the innate ability to escape from predation. Examples for the same are given below. Select the incorrect example_____ .

a) Colour change in Chameleon

b) Enlargement of body size by swallowing air in puffer fish c) Poison fangs in snakes

d) Melanism in moths

258. Which of the following statements is true?

a) Wings of birds and insects are homologous organs

b) Human hands and bird's wings are analogous organs

c) Human hands and bat's wings are analogous organs.

d) Flipper of penguin and dolphin are analogous organs.

259. Basic principles of embryonic development were pronounced by_____

a) Von Baer b) Weismann c) Haeckel d) Morgan

260. Genetic drift is change of_____

a) gene frequency in same generation b) appearance of recessive genes

c) gene frequency from one generation to next d) None of the above

261. The primate which existed 15 mya was

a) Homo habilis b) Australopithecus c) Ramapithecus d) Homo erectus

262. Which of the following statements is related to Karl Ernst von Baer?

a) Embryos never pass through the adult stages of other animals.

b)

Comparative anatomy shows differences among organisms of today and those that existed years ago.

c)

Certain features during embryonic stages are common to all vertebrates that are absent in adult

d) Ontogeny repeats phylogeny

263. Which one is not a vestigial organ?

a) Wings of kiwi b) Coccyx in man c) Pelvic girdle of python d) Flipper of seal

264. The following are some major events in the early history of life:

P. First heterotrophic prokaryotes

Q. First genes

R. First eukaryotes

S. First autotrophic prokaryotes

T. First animals

Which option below places these events in the correct order?

- a) $P \rightarrow Q \rightarrow S \rightarrow R \rightarrow T$ b) $Q \rightarrow S \rightarrow P \rightarrow T \rightarrow R$ c) $Q \rightarrow P \rightarrow S \rightarrow R \rightarrow T$
d) $Q \rightarrow S \rightarrow P \rightarrow R \rightarrow T$

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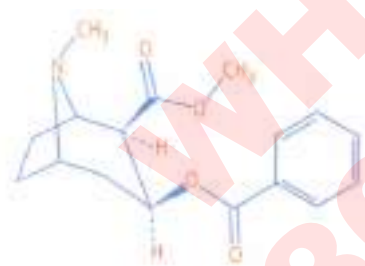
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HUMAN HEALTH AND DISEASES 1

Marks : 1146

1. ELISA is used to detect viruses where the key reagent is _____.
a) RNase b) alkaline phosphatase c) catalase d) DNA probe
2. The active form of *Entamoeba histolytica* feeds upon _____.
a) mucosa and submucosa of colon only b) food in intestine c) blood only
d) erythrocytes; mucosa and submucosa of colon
3. The substance produced by a cell in viral infection that can protect other cells from further infection is
a) serotonin b) colostrum c) interferon d) histamine
4. Reason of lung cancer _____.
a) Asbestos b) Calcium fluoride c) Cement factory d) Bauxite mining
5. Common cold differs from pneumonia in, that _____.
a)
Pneumonia is a communicable disease whereas the common cold is a nutritional deficiency disease
b)
Pneumonia can be prevented by a live attenuated bacterial vaccine whereas the common cold has no effective vaccine
c)
Pneumonia is caused by a virus while the common cold is caused by the bacterium *Haemophilus influenzae*
d)
Pneumonia pathogen infects alveoli whereas the common cold affects nose and respiratory passage but not the lungs.
6. A substance produced by the host in response to an infection of foreign structure is
a) Antigen b) Phytotoxin c) Antibody d) Hormone
7. Read the following statements and select the correct option.
Statement 1: Active immunity is developed when a person's own cells produce antibodies in response to infection or vaccine.
Statement 2: Injection of snake antivenom against snake bite is an example of active immunisation.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect

- c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
8. Select the wrong statements _____
a) W.M. Stanley showed that viruses could be crystallised
b) The term 'contagium vivum fluidum' was coined by M.W. Beijerinck.
c) Mosaic disease in tobacco and AIDS in human being are caused by viruses.
d) The viroids were discovered by D.J. Ivanowski
9. Passive immunity is provided through
a) Exogenous supply of antigens b) Exogenous supply of antibodies
c) Endogenous supply of antigens d) Endogenous supply of antibodies
10. A disease contracted through wounds, accidents and improperly sterilised surgical instruments is
a) Tetanus b) Gonorrhoea c) Mumps d) Amoebiasis
11. Hepatitis B vaccine is produced from
a) inactivated viruses b) yeast c) Haemophilus influenzae
d) Salmonella typhimurium
12. In leukaemia, there is tremendous increase in the numbers of
a) R.B.Cs b) Immature cells c) W.B.Cs d) W.B.Cs and immature leucocyte cells
13. The chemical compound whose chemical structure is given below is obtained from which plant?



- a) Papaver somniferum b) Erythroxylum coca c) Atropa belladonna
d) Cannabis sativa
14. **Assertion** : Proto-oncogenes are cellular genes required for normal growth.
Reason : Under normal conditions they could lead to the oncogenic transformation of the cell.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If assertion is false but reason is true.
15. Motile zygote of Plasmodium occurs in ____

- a) Gut of female Anopheles b) Salivary glands of Anopheles c) Human RBCs
d) Human liver
16. Which out of the following groups represent autoimmune disorders?
a) SCID and diphtheria b) Diabetes mellitus (type I) and rheumatic fever
c) AIDS and cholera d) Hepatitis and leukaemia
17. Cancerous cells can easily be destroyed by radiations due to_____
a) rapid cell division b) lack of nutrition c) fast mutation d) lack of oxygen
18. To which type of barriers under innate immunity, do the saliva in the mouth and the tears from the eyes, belong?
a) Cyokine barriers b) Cellular barriers c) Physiological barriers
d) Physical barriers
19. Cancer is treated through a combination of
a) Surgery and drugs b) Drugs and irradiation c) Surgery and irradiation
d) Surgery, Irradiation and Chemotherapy
20. Diseases are broadly grouped into infectious and non-infectious diseases. In the list given below, identify the infectious diseases.
(i) Cancer
(ii) Influenza
(iii) Allergy
(iv) Small pox
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (ii) and (iv)
21. The most abundant antibody produced against allergens is
a) IgE b) IgA c) IgG d) IgM
22. Which drug is being excessively taken by some sports persons nowadays?
a) Opioids b) Barbiturates c) Cannabinoids d) Lysergic acid diethyl amides (LSD)
23. Typhoid fever in human beings is caused by
a) Plasmodium vivax b) Trichophyton c) Salmonella typhi d) Rhino viruses
24. Hypersensitivity to an allergen is associated with_____
a) aberrant functioning of the immune mechanism b) increase in ambient temperature
c) age of the individual d) food habits
25. Which of the following is the bacterial disease in humans?
a) Pneumonia b) Malaria c) Plague d) Both (a) and (c)
26. Which one of the following statements is correct w.r.t. AIDS?
a) Drug addicts are least susceptible to HIV infection
b) AIDS patients are being fully cured with proper care and nutrition
c) HIV can be transmitted through eating food together with an infected person
d) Causative HIV retrovirus attacks helper T-lymphocytes thus reducing their numbers
27. Which of the following symptoms indicate radiation sickness?

- a) Red and ulcerated skin b) Nausea and anaemia c) Nausea and loss of hair
d) Ulcerated skin, nausea and loss of hair
28. Nicotine acts as a stimulant, because it mimics the effect of _____
a) thyroxine b) acetylcholine c) testosterone d) dopamine
29. Cells of immune system that cause pore formation in the antigen are
a) Helper T-cells b) Killer T-cells c) Suppressor T-cells d) B-cells
30. The cells called 'HIV factory' is
a) helper T-cells b) macrophages c) dendritic cells d) WBCs
31. Injection of antitoxin in tetanus confers which type of immunisation?
a) Active immunisation b) Passive immunisation c) Auto-immunisation
d) Humoral immunisation
32. The organisms which cause diseases in plants and animals are called
a) pathogens b) vectors c) insects d) worms
33. Read the following statements carefully.
(i) Cancer causing viruses have genes called viral oncogenes.
(ii) Malignant tumors remain confined to their original location.
(iii) Cancer cells do not exhibit contact inhibition.
(iv) X-rays and UV rays are not potent carcinogens.
(v) Cancer detection is based on biopsy.
Which of the above statements are not correct regarding cancer?
a) (iii) and (v) b) (ii) and (iv) c) (ii), (iii) and (v) d) (ii), (iv) and (v)
34. Antibodies in our body are complex _____
a) steroids b) prostaglandins c) glycoproteins d) lipoproteins
35. In humans, receptors for opioids are present in
a) central nervous system b) gastrointestinal tract c) respiratory tract
d) both (a) and (b)
36. U8 L.S.D. is _____
a) hallucinogenic b) sedative c) stimulant d) tranquiliser
37. Which of the following statements is correct with respect to AIDS
a) AIDS patients are being fully cured cent per cent with proper care and nutrition
b)
The causative HIV retrovirus enters helper T lymphocytes thus reducing their numbers
c) The HIV can be transmitted through eating food together with an infected person
d) Drug addicts are least susceptible to HIV infections
38. Which one of the following is the correct statement regarding the particular psychotropic drug specified?
a) Barbiturates cause relaxation and temporary euphoria
b) Hashish causes after thought perceptions and hallucinations

- c) Opium stimulates nervous system and causes hallucinations
d) Morphine leads to delusions and disturbed emotions
39. A person showing unpredictable moods, outbursts of emotion, quarrelsome behaviour and conflicts with other is suffering from_____
- a) Borderline personality disorder (BPD) b) Mood disorders c) Addictive disorders
d) Schizophrenia
40. Which of the following disease has been eradicated from world by the use of vaccine?
- a) Plague b) Poliomyelitis c) Small pox d) Kala-azar
41. **Assertion:** In malaria, a person experiences chills and high fever recurring every three to four days.
Reason: This is caused by the release of haemozoin with rupture of liver cells.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
42. Which of these glands is large at the time of birth but in adults, it reduces to a very small size?
- a) Thyroid b) Adrenal c) Thymus d) Spleen
43. Which of the following day is celebrated as 'World AIDS Day'?
- a) 31st March b) 1st March c) 1st December d) 31st December
44. The addictive chemical present in tobacco is
- a) caffeine b) nicotine c) catechol d) carbon monoxide
45. A hospital technician, while doing some routine culturing of microorganisms in a lab, noticed a bacterial colony growing on a culture medium containing three different antibiotics. He identified the bacterium as one that did not cause a human disease, but he still reported his observation to the hospital administration. He was worried because
- a) he had no way of killing this bacterium now that it was resistant to antibiotics
- b)
resistance to antibiotics could be transferred to disease-causing bacteria by transduction or conjugation
- c)
the bacterium might feed on the antibiotics and therefore, be able to grow in people taking these antibiotics
- d)
if people accidentally eat contaminated food inside the hospital, they would become resistant to the antibiotic

46. Which of the following statements regarding the disease typhoid is/are correct?
- (i) Salmonella typhi are the pathogenic bacteria which enter human intestine through contaminated food and water and migrate to other organs through blood.
 - (ii) Sustained high fever (39°C to 40°C), weakness, stomach pain, constipation, headache and loss of appetite are some common symptoms of typhoid.
 - (iii) Typhoid vaccine is available as DPT vaccine.
 - (iv) Widal test is used for diagnosis of typhoid fever.
 - (v) The patient of this disease is not required to be treated with antibiotics.
- a) (i) and (ii) b) (iii) and (v) c) (i), (ii) and (iv) d) (i), (ii), (iii) and (iv)
47. **Assertion :** IgG is the most abundant class of Igs in the body.
Reason : IgG is mainly found in sweat, tears, saliva, mucus, colostrum and gastro intestinal secretions.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
48. Cells involved in immune mechanism are _____
- a) erythrocytes b) lymphocytes c) eosinophils d) thrombocytes
49. If a person shows production of interferons in his body, the chances are that he has got an infection of _____
- a) typhoid b) measles c) tetanus d) malaria
50. Ringworm in humans is caused by _____
- a) Bacteria b) Fungi c) Nematodes d) Viruses
51. Elephantiasis, a chronic inflammation that results in gross deformities is caused by:
- a) Ascaris b) E.coli c) Wuchereria d) Trichophyton
52. Which of the following best defines an oncogene?
- a)
An oncogene is a dominantly expressed mutation which gives a cell a growth or survival advantage
- b)
An oncogene codes for a mutated form of a protein which forms part of a signal transduction pathway
- c) An oncogene codes for a protein which prevents the cell from undergoing apoptosis
- d) An oncogene codes for a cell cycle control protein
53. Which of the following sexually transmitted diseases is not completely curable?
- a) Genital warts b) Genital herpes c) Chlamydia d) Gonorrhoea
54. Damage to thymus in a child may lead to _____

- a) a reduction in haemoglobin content of blood b) a reduction in stem cell production
c) loss of antibody mediated immunity d) loss of cell mediated immunity
55. Passive immunity can be conferred directly by
a) vaccines b) antitoxins c) colostrum d) both (b) and (c)
56. The injection given against the snake venom contains
a) antigenic proteins b) preformed antibodies c) attenuated pathogen
d) all of these
57. AIDS is characterised by
a) decrease in the number of killer T-cells
b) decrease in the number of suppressor T-cells
c) decrease in the number of helper T-cells d) increase in the number of helper T-cells
58. **Assertion:** Benign tumours are called neoplastic cells.
Reason: Malignant tumour remain in place to form a compact mass by a process known as metastasis.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If assertion is true but reason is false.
59. Which form of pathogen is used in vaccination?
a) Activated and strong pathogenic antigens
b) Inactivated and weakened pathogenic antigens
c) Hyperactive and strong pathogen d) Preformed antibodies
60. **Assertion :** All immunoglobulin molecules have a basic structure composed of four polypeptide chains.
Reason : The polypeptide chains consists two identical heavy and light chain connected by disulphide bonds.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
61. Humoral immunity is associated with
a) T-cells b) B-cells c) macrophages d) both (a) and (b)
62. An intestinal parasite which causes blockage of the intestinal passage and whose eggs are excreted along with the faeces of infected person is _____

- a) Wuchereria bancrofti b) Ascaris c) Epidermophyton d) Microsporum
63. The antibody which can cross placental barrier is
a) IgA b) IgE c) IgM d) IgG
64. In which disease does mosquito transmitted pathogen Causes chronic inflammation of lymphatic vessels?
a) Ringworm disease b) Ascariasis c) Elephantiasis d) Amoebiasis
65. Cancer cells are characterised by
a) Uncontrolled growth b) Spreading to the other body parts
c) Invasion of local tissue d) All of these
66. Natality refers to____
a) number of individuals leaving the habitat b) birth rate c) death rate
d) number of individuals entering a habitat
67. Which of the following endoparasites of humans does show viviparity ?
a) Enterobius vermicularis b) Trichinella spiralis c) Ascaris htmbricoides
d) Ancylostoma duodenale
68. Which of the following is not a lymphoid tissue?
a) Spleen b) Tonsils c) Pancreas d) Thymus
69. Which one of the following is not correctly matched____
a) Glossina palpalis - Sleeping sickness b) Cuicx pipiens - Filariasis
c) Aedes aegypti - Yellow fever d) Anopheles culifacies - Leishmaniasis
70. Which one of the following conditions though harmful in itself, is also a potential saviour from a mosquito borne infectious disease?
a) Leukemia b) Thalassemia c) Sickle cell anaemia d) Pernicious anaemia
71. Which one of the following is a mismatched pair of the drug and its effect?
a) Amphetamines - CNS stimulants
b) Lysergic acid diethylamide (LSD) - Psychedelic (hallucinogen)
c) Heroin - Depressant, slows down body functions d) Barbiturates - Tranquilliser
72. MALT is
a) Muscle Associated Lymphoid Tissues b) Mucosal Associated Lymphoid Tissues
c) Mucosal and Lymphoid Tissue d) Memory Associated Lymphoid Tissues
73. **Assertion** : Cornea is considered as an immunologically privileged site.
Reason : A transplanted cornea is rarely rejected.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.

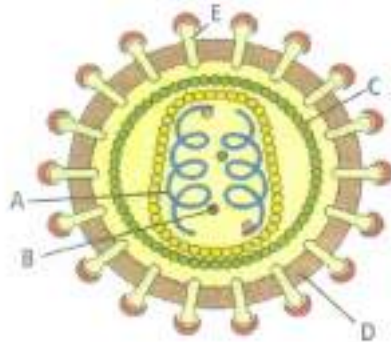
74. HIV that causes AIDS, first starts destroying_____
- a) Leucocytes b) Helper T- Lymphocytes c) Thrombocytes d) B- Lymphocytes
75. Which one of the following is correct match?
- a) Reserpine - Tranquiliser b) Cocaine - Opiate narcotic
c) Morphine - Hallucinogenic d) Bhang - Analgesic
76. Charas and ganja are the drugs which affect
- a) respiratory system b) cardiovascular system c) digestive system
d) nervous system
77. Widal Test is carried out to test_____
- a) Malaria b) Diabetes mellitus c) HIV/AIDS d) Typhoid fever
78. The human immuno deficiency virus is
- a) an unenveloped, RNA genome containing retrovirus
b) an enveloped, RNA genome containing retrovirus
c) an enveloped, DNA genome containing retrovirus
d) an enveloped, RNA genome containing rheovirus
79. Which of the following glands is large sized at birth but reduces in size with ageing?
- a) Pineal b) Pituitary c) Thymus d) Thyroid
80. The site where lymphocytes interact with antigens and proliferate to become effector cells are
- a) spleen and lymph nodes b) bone marrow and thymus
c) Peyer's patches and tonsils d) both (a) and (c)
81. The common cold is caused by
- a) Rhino viruses b) Streptococcus pneumoniae c) Salmonella typhimurium
d) Plasmodium vivax
82. Gambusia is a fish which is being introduced into the ponds in order to check the vector borne diseases such as
- a) dengue b) malaria c) chikungunya d) all of these
83. Which one of the following pairs of diseases is viral as well as transmitted by mosquitoes?
- a) Encephalitis and sleeping sickness b) Yellow fever and sleeping sickness
c) Elephantiasis and dengue d) Yellow fever and dengue
84. Which one of the following diseases cannot be cured by taking antibiotics?
- a) Plague b) Amoebiasis c) Leprosy d) Whooping cough
85. Which of the following factors affect human health?
- (i) Infections
(ii) Silent mutations
(iii) Life style
(iv) Genetic disorders

- a) (i), (ii) and (iv) b) (i) and (ii) c) (i), (iii) and (iv) d) (i), (ii), (iii) and (iv)

86. Antivenom against snake poison contains

- a) antigens b) antigen-antibody complexes c) antibodies d) enzymes

87. Identify A, B, C, D and E in the given diagram of HIV virus.



a)

A-RNA, B-Reverse transcriptase, C-Capsule protein coat, D-Lipid membrane, E-Envelope protein coat

b)

A - RNA, B - Reverse transcriptase, C-lipid membrane, D-Envelope protein coat, E-Capsule protein coat

c)

A-Reverse transcriptase, B-Lipid membrane, C-RNA, D-Capsule protein coat, E-Envelope protein coat

d)

A-RNA, B-Reverse transcriptase, C-Envelope protein coat, D-Lipid membrane, E-Capsule protein coat

88. Antivenom infection contains performed antibodies while polio drops that are administered into the body contain:

- a) Attenuated pathogens b) Activated pathogens c) Harvested antibodies
d) Gamma globulin

89. Which of the following is affected by the infection of Wuchereria bancrofti?

- a) Lymphatic vessels b) Respiratory system c) Nervous system
d) Blood circulation

90. ELISA is used to detect viruses, where _____

- a) DNA-probes are required b) Southern blotting is done
c) Alkaline phosphatase is the key reagent d) Catalase is the key reagent

91. Koch's postulates are not applicable to _____

- a) cholera b) leprosy c) TB d) diphtheria

92. Which of the following components does not participate in innate immunity?

- a) Neutrophils b) Macrophages c) B-lymphocytes d) Natural killer cells

93. Following table summarises the differences between normal cells and cancerous cells. Pick up the wrong difference(s) and select the correct option.

Normal cells	Cancerous cells
--------------	-----------------

(i)	These cells undergo cell division as well as differentiation.	These cells undergo cell division but do not undergo differentiation.
(ii)	These cells show contact inhibition i.e contact with other cells, these inhibit their uncontrolled growth.	These cells have lost the property of contact inhibition.
(iii)	Life span of these cells is not definite	Life span of these cells is definite
(iv)	These cells divide in controlled manner	These cells divide in an uncontrolled manner.

a) (i) and (iii) b) (iii) and (iv) c) (iii) only d) (ii) only

94. Which is the particular type of drug that is obtained from the plant whose one flowering branch is shown here?



a) Hallucinogen b) Depressant c) Stimulant d) Pain-killer

95. Following are some statements regarding the primary and secondary antibody response in humans. All the statements are correct except

- a) lag period (time between the introduction of antigen and appearance of antibodies in blood) in primary response is longer than that in secondary response
- b) predominant isotype produced in primary response is IgM while that in secondary response is IgG
- c) primary antibodies have a higher affinity for antigen as compared to secondary antibodies
- d) primary immune response is more quicker and intense than secondary immune response

96. Which of the following cancer is opportunistic disease associated with HIV?

- a) Cancer of cervix b) Liver cancer c) Burkitt's lymphoma d) Kaposi's sarcoma
97. Along with nicotine, cigarette smokers receive tars, phenols, hydrocarbons, arsenic, and many other chemicals. Which of the following is not an effect of smoking tobacco?
- a) Narrowing or hardening of blood vessels in the heart and brain
b) A higher frequency of respiratory infections (e.g., colds, pneumonia)
c)
A higher risk of cancer, including cancer of the lungs, mouth, larynx, bladder and kidneys
d) None of these
98. Identify the wrong statement with reference to immunity_____
- a) Active immunity is quick and gives full response
b) Foetus receives some antibodies from mother, it is an example for passive immunity
c)
When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity"
d) When ready made antibodies are directly given, it is called "Passive immunity"
99. A chemical carcinogen present in tobacco smoke is responsible for
- a) skin cancer b) pancreatic cancer c) stomach cancer d) lung cancer
100. Use of vaccines and immunisation programmes have controlled which of the following infectious diseases?
- a) Polio and tetanus b) Diphtheria and pneumonia c) Cancer and AIDS
d) Both (a) and (b)
101. Primary response produced due to first time encounter with a pathogen is of
- a) high intensity b) low intensity c) intermediate intensity d) no intensity
102. The sporozoites that cause infection, when a female Anopheles mosquito bites a person, are formed in
- a) liver of the person b) RBCs of mosquito c) salivary glands of mosquito
d) intestine of mosquito
103. One of the following is not the causal organism for ringworm.
- a) Microsporum b) Trichophyton c) Epidermophyton d) Macrosporum
104. **Assertion** : Mucous membrane immobilises the microorganisms in the body.
Reason : Microorganisms and dust particles entering the respiratory tract are trapped in the mucus.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

105. Metastasis is connected with

- a) Benign tumour b) Malignant tumour c) Both benign and malignant tumours
d) Crowngall tumour

106. Which one of the following is not a property of cancerous cells whereas the remaining three are?

- a) They divide in an uncontrolled manner b) They show contact inhibition
c) They compete with normal cells for vital nutrients
d) They do not remain confined in the area of formation

107. Match each disease with its correct type of vaccine

(A) Tuberculosis	(i) Harmless virus
(B) Whooping cough	(ii) Inactivated toxin
(C) Diphtheria	(iii) Killed bacteria
(D) Polio	(iv) Harmless bacteria

a)	b)	c)	d)																																
<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(ii)</td><td>(i)</td><td>(iii)</td><td>(iv)</td></tr></table>	A	B	C	D	(ii)	(i)	(iii)	(iv)	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iii)</td><td>(ii)</td><td>(iv)</td><td>(i)</td></tr></table>	A	B	C	D	(iii)	(ii)	(iv)	(i)	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(iv)</td><td>(iii)</td><td>(ii)</td><td>(i)</td></tr></table>	A	B	C	D	(iv)	(iii)	(ii)	(i)	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>(i)</td><td>(ii)</td><td>(iv)</td><td>(i)</td></tr></table>	A	B	C	D	(i)	(ii)	(iv)	(i)
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(i)	(ii)	(iv)	(i)																																

108. Select the correct statements regarding the characteristics of acquired immunity.

- (i) Cell-mediated immunity is responsible for acquired immunity.
(ii) It produces a primary response of low intensity.
(iii) Active and passive immunity are types of acquired immunity.
(iv) Polymorphonuclear leucocytes and natural killer cells are involved in acquired immunity.

a) (i) and (iv) b) (i) and (iii) c) (i), (ii) and (iii) d) (i), (iii) and (iv)

109. **Assertion** : Tobacco contains a large number of alkaloids including nicotine.

Reason : Nicotine stimulates adrenal glands which decrease blood pressure and increase heart rate.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If assertion is true but reason is false.

110. Salmonella is related with_____

- a) Typhoid b) Poho c) T.B d) Tetanus

111. The abbreviation AIDS stands for

- a) Acquired immuno disease for b) Acquired immuno deficiency syndrome
c) Acquired immunity determining syndrome d) Acquired immunity delay syndrome

112. Analgesic drugs_____

a) form tissues b) relieve pain c) relieve fatigue d) cause pain

113. The 'blue baby' syndrome results from _____

- a) methaemoglobin b) excess of dissolved oxygen
c) excess of TDS (total dissolved solids) d) excess of chloride

114. Amoebic dysentery (amoebiasis) is caused by

- a) *Entamoeba histolytica* b) *E.coli* c) *Streptococcus pneumoniae* d) *Trichophyton*

115. Widal test is used for the diagnosis of _____

- a) Malaria b) pneumonia c) Tuberculosis d) Typhoid

116. Select the correct statement with respect to the given plants.



a) Opium is dried latex obtained from the unripe capsular fruits of plant A.

b)

The drug obtained from plant C is cocaine that is a powerful CNS stimulant, which increases a person's mental alertness and physical activity

c)

Plant B belongs to Family Moraceae; bhang, ganja, charas and marijuana are the hallucinogenic products obtained from this plant

d) All of these

117. Following are the differences between innate immunity and acquired immunity.

	Innate immunity	Acquired immunity
(i)	It is inherited by an organism from the parents and protects it from birth throughout life.	It is acquired by an organism after birth.
(ii)	It is also called as specific immunity.	It is also called as non-specific immunity
(iii)	It consists of different types of barriers that prevent the entry of foreign agents.	It consists of specialised cells (T-cells and B-cells) and antibodies that circulate in the body fluid.

Select the option with correct pair of differences.

- a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (i), (ii) and (iii)

118. Which of the following set of diseases is caused by bacteria?

- a) Cholera and tetanus b) Typhoid and small pox c) Tetanus and mumps
d) Herpes and influenza

119. Read the following statements regarding the various techniques used in cancer detection.

(i) Cancer detection is based on biopsy and histopathological studies of the tissue, and blood and bone marrow tests for increased cell counts in case of leukaemia. (ii) In biopsy, a piece of the suspected tissue cut into thin sections is stained and examined under microscope by a pathologist.

(iii) Techniques like radiography (use of x-rays), CT (computed tomography) and MRI

(magnetic resonance imaging) are very useful to detect cancers of the internal organs.

(iv) Computed tomography uses strong magnetic fields and non-ionising radiations to detect physiological changes in living tissues.

(v) MRI uses X-rays and ionising radiation to generate a 3-D image of the internal structure of an object.

Which of the above statements are incorrect?

a) (i) and (iii) b) (ii) and (iv) c) (iii) and (iv) d) (iv) and (v)

120. Recurrent high fever in malaria is due to completion of

a) Erythrocytic schizogony b) Sporogony c) Gamogony
d) Exoerythrocytic schizogony

121. Which part of poppy plant is used to obtain the drug "Smack"?

a) Roots b) Latex c) Flowers d) Leaves

122. The substance given to cancer patients in order to activate their immune system and destroy the tumour is

a) histamine b) interleukin c) α -interferon d) morphine

123. _____ is a CNS stimulant as it interferes with the transport of the neurotransmitter _____

a) Cocaine, acetylcholine b) Barbiturate, glutamate c) Cocaine, dopamine
d) Barbiturate, glycine

124. Cirrhosis of liver is caused by the chronic intake of _____

a) Opium b) Alcohol c) Tobacco (Chewing) d) Cocaine

125. Cocaine is commonly called as

a) smack b) coke c) crack d) both (b) and (c)

126. A metastatic cancerous tumour is termed 'sarcoma' if the disorder is in

a) fibroblasts b) circulatory system c) immune system d) epithelial cells

127. Carcinoma is a malignancy of

a) Bone b) Blood c) Epithelial tissues d) Reticuloendothelial tissue

128. A certain patient is suspected to be suffering from acquired immune deficiency syndrome.

Which diagnostic technique will you recommend for its detection?

a) ELISA b) MRI c) Ultrasound d) WIDAL

129. Name the chronic respiratory disorder caused mainly by cigarette smoking

a) Respiratory alkalosis b) Emphysema c) Asthma d) Respiratory acidosis

130. The most abundant class of immunoglobulins (Igs) in the body is

a) IgA b) IgG c) IgE d) IgM

131. Cocaine is obtained from

a) Erythroxylon coca b) Papaver somniferum c) Atropa belladonna
d) Datura stramonium

132. Which of the following statements is not correct?

- a) Higher vertebrates can distinguish foreign organisms from self-cells
b)
Fetus receives antibodies from its mother through placenta, is an example of active immunity
c) Cell-mediated immunity involves T-lymphocytes
d) Antibodies against cancer-specific antigens are used for detection of certain cancers
133. Which of the following pair of diseases is caused by virus?
a) Rabies, mumps b) Cholera, tuberculosis c) Typhoid, tetanus d) AIDS, syphilis
134. Passive immunity was discovered by _____
a) Edward Jenner b) Emil von Behring c) Robert Koch d) Louis Pasteur
135. Appearance of dry, scaly lesions with itching on various parts of the body are the symptoms of _____
a) elephantiasis b) ringworm c) ascariasis d) amoebiasis
136. Heroin is commonly called as
a) coke b) crack c) smack d) charas
137. Viral DNA after being converted from viral RNA by X, incorporates into host genome to undergo replication. What is 'X'?
a) DNA polymerase b) Restriction endonuclease c) RNA polymerase
d) Reverse transcriptase
138. Antibodies present in colostrum which protect the new born from certain diseases is of
a) IgG type b) IgA type c) IgD type d) IgE type
139. Use of anti-histamines and steroids give a quick relief from _____.
a) nausea b) cough c) headache d) allergy
140. Choose the incorrect statement w.r.t. AIDS
a) Viral RNA genome is converted into copy DNA by reverse transcriptase
b) It is caused by an enveloped retrovirus HIV c) It is an immunodeficiency disease
d) HIV selectively infects and kills B-lymphocytes
141. The pathogen *Microsporum* responsible for ringworm disease in humans belong to the same kingdom of organisms as that of :
a) *Taenia*, a tapeworm b) *Wuchereria*, a filarial worm c) *Rhizopus*, a mould
d) *Ascaris*, a roundworm
142. An antibody consists of
a) two light peptide chains and two heavy peptide chains
b) two light peptide chains and one heavy peptide chain
c) one light peptide chain and one heavy peptide chain
d) one light peptide chain and two heavy peptide chains
143. The genetic material of HIV is

- a) dsDNA b) dsRNA c) ssDNA d) ssRNA
144. Transplantation of tissues/organs fails often due to non-acceptance by the patient's body. Which type of immune-response is responsible for such reflection?
a) Autoimmune response b) Cell-mediated immune response
c) Hormonal immune response d) Physiological immune response
145. Which one of the following acts as a physiological barrier to the entry of micro-organisms in human body?
a) Epithelium of urogenital tract b) Tears c) Monocytes d) Skin
146. ELISA is used in detection of
a) Hay fever b) Tetanus c) AIDS d) Tuberculosis
147. Antibodies are secreted by
a) T-lymphocytes b) B-lymphocytes c) both (a) and (b) d) natural killer cell
148. Which one of the following sets includes bacterial diseases?
a) Tetanus, tuberculosis, measles b) Diphtheria, leprosy, plague
c) Cholera, typhoid, mumps d) Malaria, mumps, poliomyelitis
149. Which of the following viruses is not transferred through semen of an infected male?
a) Human immunodeficiency virus b) Chikungunya virus c) Ebolavirus
d) Hepatitis B virus
150. Which drug is used as medicine to help patients cope with depression and insomnia?
a) Morphine b) Amphetamines c) Barbiturate d) Both (b) and (c)
151. Which of the following is a pair of viral diseases?
a) Common cold, AIDS b) Dysentery, common cold c) Typhoid, tuberculosis
d) Ringworm, AIDS
152. Opiate narcotic is____
a) bhang b) charas c) heroin d) nicotine
153. Which of the following disease is now considered nearly eradicated from India?
a) Smallpox b) Poliomyelitis c) Plague d) Kala-azar
154. A disease which can be transferred from mother to child through placenta is
a) German measles b) Syphilis c) AIDS d) All of these
155. AIDS is caused by HIV that principally infects____
a) all lymphocytes b) activator B cells c) cytotoxic T cells d) T₄ lymphocytes
156. During the life cycle of Plasmodium, sexual reproduction takes place in which of the following hosts?
a) Human b) Female Anopheles mosquito c) Male Anopheles mosquito
d) Both (a) and (b)
157. The cell in the human body invaded by the (human immuno-deficiency virus (HIV) is____
a) T-helpercell b) Erythrocyte c) B-cell d) Macrophage
158. HIV is a retrovirus that attacks

a) helper T-cells b) cytotoxin T-cells c) B-cells d) neutrophils

159. Each immunoglobulin has two heavy chains and two light chains. The antigen binding site is found in

- a) Variable region of heavy chain b) Variable region of light chain
c) Constant region of light chain d) Variable region of both heavy and light chain

160. Match the following diseases with the causative organism and select the correct option.

Column-I	Column-II
(a) Typhoid	(i) Wuchereria
(b) Pneumonia	(ii) Plasmodium
(c) Filariasis	(iii) Salmonella
(d) Malaria	(iv) Haemophilus

- a) (ii) (i) (iii) (iv) b) (iv) (i) (ii) (iii) c) (i) (iii) (ii) (iv) d) (iii) (iv) (i) (ii)

161. A toxic substance, responsible for the chills and high fever recurring every three to four days in malarial fever, is

- a) interferon b) haemozoin c) hirudin d) colostrum

162. Which of the following statements is incorrect?

a)

Pneumonia can be transmitted to a healthy person by inhaling the droplets released by an infected person and also by sharing utensils

b)

Pathogens causing pneumonia are Streptococcus pneumoniae and Haemophilus influenzae

- c) There is no vaccine yet available to prevent pneumonia. d) None of these

163. Elderly people are advised to get influenza (flu) vaccinations every year. Each year, a different type of flu vaccine has to be made. This is because

a)

Elderly people are advised to get influenza (flu) vaccinations every year. Each year, a different type of flu vaccine has to be made. This is because

- b) vaccines are unstable and cannot be stored for more than one year

c)

the body learns to destroy the antibodies made against the vaccine, so a new type of vaccine is needed for each vaccination

d)

flu viruses change their genetic constituents so rapidly that vaccines against them rapidly become obsolete

164. The drugs used to quickly reduce the symptoms of allergy are

- a) anti-histamine and adrenaline b) histamine and thyroxine
c) adrenaline and α -interferon d) all of these

165. 'Smack' is a drug obtained from the

- a) latex of *Papaver somniferum* b) leaves of *Cannabis sativa* c) flowers of *Datura*
d) fruits of *Erythroxyl coca*
166. Which of the following is an opiate narcotic?
a) Barbiturates b) Morphine c) Amphetamines d) LSD
167. AIDS is caused by HIV. Among the following, which one is not a mode of transmission of HIV?
a) Transfusion of contaminated blood b) Sharing the infected needles
c) Shaking hands with infected persons d) Sexual contact with infected persons
168. A protein or polysaccharide molecule that stimulates antibody formation
a) antigen b) antibiotics c) exotoxin d) endotoxins
169. Which of the following diseases is caused by a protozoan?
a) Influenza b) Babesiosis c) Blastomycosis d) Syphilis
170. The main reason why antibiotics could not always treat the bacteria-mediated diseases is
a) insensitivity of the individual following prolonged exposure to antibiotics
b) inactivation of antibiotics by bacterial enzymes
c) decreased efficiency of immune system
d) the development of mutant bacterial strains resistant to antibiotics
171. The disease chikungunya is transmitted by
a) house flies b) *Aedes* mosquitoes c) cockroach d) female *Anopheles*
172. Which of the following cells actively participate during allergy?
a) B-lymphocytes b) Liver cells c) Mast cells d) Red blood cells
173. In malignant tumors, the cells proliferate, grow rapidly and move to other parts of the body to form new tumors. This stage of disease is called
a) metagenesis b) metastasis c) teratogenesis d) mitosis
174. At which stage of HIV infection does one usually show symptoms of AIDS?
a) When the infecting retrovirus enters host cells
b) When viral DNA is produced by reverse transcriptase
c)
When HIV replicates rapidly in helper T-lymphocytes and damages large number of these
d) Within 15 day of sexual contact with an infected person
175. *Entamoeba histolytica* is transmitted through
a) Insect bite b) Sweat c) Food and water contamination d) Bird droppings
176. Grafted kidney may be rejected in a patient due to____
a) Cell-mediated immune response b) Passive immune response
c) Innate immune response d) Humoral immune response
177. Botulism caused by *Clostridium botulinum* affects the____
a) spleen b) intestine c) lymph glands d) neuromuscular junction

178. Read the following statements and select the correct option.

Statement 1: Malignant tumors normally remain confined to their original location, do not spread to other body parts and cause less damage.

Statement 2: Cancer arising from epithelial tissues of internal organs and glands is referred to as sarcoma e.g., breast cancer, cervical cancer etc.

- a) Both statements 1 and 2 are correct
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct
- d) Both statements 1 and 2 are incorrect

179. Which of the following will be curable in next two decades?

- a) tuberculosis b) cancer c) polio myelitis d) None of these

180. Match column I with column II and select the correct option from codes given below.

Column I	Column II
A. Allergy	(i) Activation of B-cells
B. Helper T - cells	(ii) Immunotherapy
C. AIDS virus	(iii) Carcinogens
D. X-rays	(iv) IgE
E. Treatment of cancer	(v) Single stranded RNA

- a) A-(iv), B-(i), C-M D-(iii), E-(ii) b) A-(ii), B-(i), C-(v), D-(iii), E-(iv)
- c) A-(iv), B-(v), C-(iii), D-(ii), E-(i) d) A-(ii), B-(v), C-(iii), D-(i), E-(iv)

181. **Assertion:** Streptococcus pneumoniae and Haemophilus influenzae are responsible for causing infectious disease in human beings.

Reason: A healthy person acquires the infection by inhaling the droplets/aerosols released by an infected person.

- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.

182. Read the following statements and select the correct option.

Statement 1: When the immune system fails to recognise 'self' from 'nonself and starts destroying body's own proteins, this leads to auto-immune diseases.

Statement 2: Addison's disease and rheumatoid arthritis are auto-immune diseases.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

183. A person has developed interferons in his body. He seems to carry an infection of

- a) tetanus b) malaria c) measles d) typhoid
184. The letter T in T -lymphocyte refers to _____
a) Thalamus b) Tonsil c) Thymus d) Thyroid
185. Which one of the following immunoglobulins does constitute the largest percentage in human milk?
a) IgM b) IgA c) IgG d) IgD
186. **Assertion :** Subsequent encounter with the same pathogen elicits a highly intensified anamnestic response.
Reason : This is based on the fact that our body appears to have memory of the first encounter.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
187. Marijuana is extracted from
a) dried leaves and flowers of hemp plant b) ergot fungus c) roots of hemp plant
d) cocoa plant
188. Where will you look for the sporozoites of malarial parasite?
a) Saliva of infected female Anopheles mosquito
b) Salivary glands of freshly moulted female Anopheles mosquito.
c) Spleen of infected humans d) RBCs of humans suffering from malaria
189. Read the following statements and select the correct option.
Statement 1: Malarial parasite requires two hosts - humans and mosquitoes to complete its life cycle.
Statement 2: Haemozoin is a toxic substance produced by the rupturing of liver cells during malarial infection.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.
190. Malarial parasite can be obtained in RBCs of patient
a) When temperature reaches normal b) An hour before rise in temperature
c) When temperature rises with rigor d) A few hours after temperature reaches normal
191. Haemozoin is a
a) precursor of haemoglobin b) toxin released from Streptococcus infected cells
c) toxin released from Plasmodium infected cells

- d) toxin released from Haemophilus infected cells
192. Which of the following is most infectious disease?
a) Hepatitis-B b) AIDS c) Amoebiasis d) Malaria
193. Read the following statements and select the correct option.
Statement 1: Many fungi belonging to genera Microsporum, Trichophyton and Epidermophyton are responsible for the disease ringworm.
Statement 2: Ringworm infection is generally acquired from soil or by using towels, clothes, comb, etc. of infected individuals.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
194. Which of the following approaches are used for the treatment of cancer?
a) Immunotherapy b) Surgery c) Radiotherapy and chemotherapy d) All of these
195. Read the following statements and select the correct option.
Statement 1: The exaggerated response of the immune system to certain antigens present in the environment is called as allergy.
Statement 2: The allergic tendency is genetically passed from the parent to the offspring and is characterised by the presence of large quantities of IgG antibodies in the blood.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
196. Vaccine against polio viruses is an example of
a) auto-immunisation b) passive immunisation c) active immunisation
d) simple immunisation
197. The term 'antitoxin' refers to a preparation containing:
a) B-lymphocytes and T-lymphocytes b) antibodies to the toxin
c) weakened pathogen d) inactivated T-lymphocytes
198. AIDS spreads due to
a) Unprotected sexual contact b) Infected needles and syringes
c) Infected mother to foetus d) All of these
199. Carcinoma refers to____
a) benign tumours of the connective tissue
b) malignant tumours of the connective tissue
c) malignant tumours of the skin or mucous membrane
d) malignant tumours of the colon
200. Which of the following antibody is related to allergic response?

- a) IgA b) IgE c) IgM d) IgG
201. Hepatitis B is transmitted through
a) sneezing b) female Anopheles c) coughing d) blood transfusion
202. Read the given statements carefully.
(i) Innate immunity is a specific type of defence, that is present at the time of birth.
(ii) Malignant malaria is caused by Plasmodium falciparum.
(iii) Malaria could be confirmed by Widal test.
(iv) Active immunity is slow and takes time to give its full effective response.
(v) Saliva in the mouth acts as physiological barrier for pathogens.
Which of the above statements are correct?
a) (ii), (iv) and (v) b) (i) and (iii) c) (i) and (v) d) (ii), (iii) and (v)
203. Which of the following plants possesses hallucinogenic properties?
a) Erythroxylon coca b) Atropa belladonna c) Datura stramonium d) All of these
204. Which one of the following statements is correct with respect to AIDS?
a) The HIV can be transmitted through eating food together with an infected person
b) Drug addicts are least susceptible to HIV infection
c) AIDS patients are being fully cured cent per cent with proper care and nutrition
d)
The causative HIV virus enters helper T- lymphocytes thus reducing their numbers
205. Which one of the following statements is correct with respect to immunity?
a) Antibodies are protein molecules, each of which has four light chains
b) Rejection of a kidney graft is the function of B-lymphocytes
c) Preformed antibodies need to be injected to treat the bite by a viper snake
d) The antibodies against small pox pathogen are produced by T-lymphocytes
206. Many diseases can be diagnosed by observing the symptoms in the patient. Which group of symptoms are indicative of pneumonia?
a) Difficulty in respiration, fever, chills, cough, headache
b) Constipation, abdominal pain, cramps, blood clots
c) Nasal congestion and discharge, cough, sorethroat, headache
d) High fever, weakness, stomach pain, loss of appetite and constipation
207. Study carefully the following stages of life cycle of malarial parasite i.e., Plasmodium. Arrange these stages in the correct sequence and select the correct answer.
1. Sporozoites leave the blood stream and enter the liver cells of man.
2. Sporozoites present in the salivary glands of female Anopheles mosquito are injected into the blood stream of man.
3. The parasite reproduces asexually in RBCs, resulting in bursting of RBCs and causing the cycles of fever; released parasites infect new RBCs.
4. The parasite reproduces asexually in liver cells, ultimately causing the rupturing of cells.
5. Two types of gametocytes i.e., microgametocytes and macrogametocytes develop in

the RBCs.

6. Female Anopheles mosquito takes up the gametocytes with blood meal of an infected person.

7. Mature infective stage of the parasite i.e., sporozoites escape from intestine and migrate to the mosquito's salivary glands.

8. Fertilisation and developmental stages of the parasite take place in mosquito's stomach.

a) $2 \rightarrow 1 \rightarrow 4 \rightarrow 3 \rightarrow 5 \rightarrow 6 \rightarrow 8 \rightarrow 7$ b) $2 \rightarrow 4 \rightarrow 1 \rightarrow 3 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8$

c) $1 \rightarrow 2 \rightarrow 4 \rightarrow 3 \rightarrow 5 \rightarrow 6 \rightarrow 8 \rightarrow 7$ d) $6 \rightarrow 8 \rightarrow 7 \rightarrow 4 \rightarrow 5 \rightarrow 2 \rightarrow 3 \rightarrow 1$

208. When an apparently healthy person is diagnosed as unhealthy by a psychiatrist, the reason could be that

- a) the patient was not efficient at his work
- b) the patient was not economically prosperous
- c) the patient shows behavioural and social maladjustment
- d) he does not take interest in sports

209. The chemical test that is used for diagnosis of typhoid is

- a) ELISA-Test b) ESR- Test c) PCR- Test d) Widal-Test

210. Which one of the following statements is true?

- a) Dysentery, plague and diphtheria are viral diseases
- b) HIV replicates in host cell with the help of reverse transcriptase enzyme
- c) The disease ringworm disappears during summer and rainy season
- d) Common cold could be confirmed by Widal test

211. Short-lived immunity acquired from mother to foetus across placenta or through mother's milk to the infant is categorised as _____

- a) innate non-specific immunity b) active immunity c) passive immunity
- d) cellular immunity

212. Typhoid fever is caused by _____ .

- a) Giardia b) Salmonella c) Shigella d) Escherichia

213. Asthma may be attributed to :

- a) Allergic reaction of the mast cells in the lungs b) Inflammation of trachea
- c) Accumulation of fluid in lungs d) Bacterial infection of the lungs

214. **Assertion** : Artificially acquired passive immunity results when antibodies or lymphocytes produced outside the host are introduced into a host.

Reason : A bone marrow transplant given to a patient with genetic immunodeficiency is an example of artificially acquired active immunity.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

215. The cell-mediated immunity inside the human body is carried out by____

a) B-lymphocytes b) Thrombocytes c) Erythrocytes d) T-lymphocytes

216. Which of the following is a bacterial disease?

a) Measles b) Chicken pox c) Rabies d) Tuberculosis

217. Which of the following statements regarding different barriers of innate immunity is not correct?

a)

Acid present in the stomach, saliva in the mouth, tears from the eyes prevent the growth of microorganisms and constitute physiological barriers of our body

b)

Mucous membrane lining the respiratory, gastrointestinal and urinogenital tracts helps in trapping the microbes and constitute physiological barriers of our body.

c)

Certain types of leucocytes such as polymorphonuclear leucocytes (PMNL-neutrophils) and lymphocytes such as natural killer cells, constitute cellular barriers of our body.

d)

Virus-infected cells secrete proteins called interferons which protect non-infected cells from further viral infection and constitute cytokine barriers of our body.

218. Which of the following are the reason(s) for Rheumatoid arthritis? Choose the correct option.

(i) The ability to differentiate pathogens or foreign molecules from self cells increases.

(ii) Body attacks self cells

(iii) More antibodies are produced in the body

(iv) The ability to differentiate pathogens or foreign molecules from self cells is lost.

a) (i) and (ii) b) (ii) and (iv) c) (iii) and (iv) d) (i) and (iii)

219. The genes causing cancer are

a) structural genes b) expressor genes c) oncogenes d) regulatory genes

220. Tobacco consumption is known to stimulate secretion of adrenaline and nor-adrenaline. The component causing this could be

a) nicotine b) tannic acid c) curaimin d) catechin

221. Which of the following is not a sexually transmitted disease?

a) Acquired Immuno Deficiency Sytndrome (AIDS) b) Trichomoniasis c) Encephalitis
d) Syphilis

222. The primary lymphoid organs are
a) spleen and thymus b) bone marrow and thymus c) bone marrow and lymph node
d) thymus and MALT
223. The infectious stage of plasmodium that enters the human body is _____.
a) Female gametocytes b) Male gametocytes c) Trophozoites d) Sporozoites
224. Which one of the following is an opiate narcotic?
a) Barbiturates b) Morphine c) Amphetamines d) LSD
225. Read the following statements regarding spleen and select the correct option.
(i) Spleen is a large oval-shaped organ which mainly contains lymphocytes and phagocytes.
(ii) Spleen is a large reservoir of erythrocytes.
(iii) Spleen is a primary lymphoid organ.
(iv) Spleen acts as a filter of the blood by trapping blood-borne microorganisms.
a) (i) and (ii) b) (ii) and (iv) c) (i), (ii) and (iii) d) (i), (ii) and (iv)
226. What is true about T-lymphocytes in mammals?
a) These are produced in thyroid
b) There are three main types - cytotoxic T-cells, helper T-cells and suppressor T-cells
c) These originate in lymphoid tissues
d) They scavenge damaged cells and cellular debris
227. Which one of the following pairs is not correctly matched?
a) Dengue fever - Flavi-ribo virus b) Syphilis - Trichuris trichiura
c) Plague - Yersinia pestis d) Filariasis - Wuchereria bancrofti
228. Which one is not spread by droplet infection?
a) Tuberculosis b) Diphtheria c) Pertussis d) Gonorrhoea
229. The chronic use of drugs and alcohol results in
a) excess mucous and blood clots b) internal bleeding and muscular pain
c) cirrhosis and nervous system damage d) leukaemias and lymphomas
230. **Assertion** : Morphine is very effective and sedative painkiller.
Reason : It is very useful for the patients who have depression.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If assertion is true but reason is false.
231. After entering T-cell, HIV first forms
a) mRNA b) Single stranded DNA c) Double stranded DNA
d) Double stranded RNA

232. DPT vaccination provides

- a) Active immunity b) Passive immunity c) Nature immunity d) Both (1) & (2)

233. The alkaloid ajmalicine is obtained from_____

- a) Atropa b) Papaver c) Curcuma d) Sarpagandha

234. MALT constitutes about _____ per cent of the lymphoid tissue in human body.

- a) 50% b) 20% c) 70% d) 10%

235. Which of the following pairs contains an infectious and a non-infectious disease respectively?

- a) Typhoid and AIDS b) AIDS and cancer c) Pneumonia and malaria
d) Cancer and malaria

236. Match the following hormones with the respective disease

(a) Insulin	(i) Addison's disease
(b) Thyroxin	(ii) Diabetes insipidus
(c) Corticoids	(iii) Acromegaly
(d) Growth - Hormone	(iv) Goitre
	(v) Diabetes mellitus

Select the correct option.

- a) (ii) (iv) (iii) (i) b) (v) (iv) (i) (iii) c) (ii) (iv) (i) (iii) d) (v) (i) (ii) (iii)

237. Human Immunodeficiency Virus (HIV) has a protein coat and a genetic material which is_____

- a) single stranded DNA b) single stranded RNA c) double stranded RNA
d) double stranded DNA

238. **Assertion** : Opioids help to enhance respiratory activity.

Reason : Opioids are the drugs which binds to specific opioid receptors present in respiratory tract.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If assertion is true but reason is false.

239. **Assertion** : Immunisation is achieved by the successful delivery of vaccines.

Reason : Vaccine is a preparation of one or more microbial agents, used to induce active immunity.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If assertion is true but reason is false.

240. The lymphoid tissue, located within the lining of digestive tract is

a) lymph nodes b) MALT c) spleen d) Peyer's patches

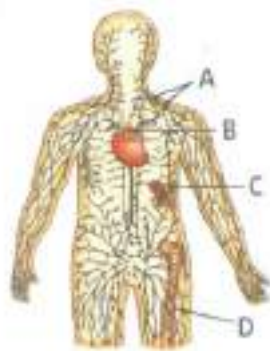
241. Several genes called _____ have been identified in normal cells which when activated will turn into _____ and under certain conditions, could lead to cancerous transformation of the cells.

Complete the above paragraph by selecting correct sequence of words.

a) oncogenes, proto oncogenes b) cellular oncogenes, proto oncogenes

c) proto oncogenes, oncogenes d) oncogenes, proto oncogenes

242. Given below is the diagram of human lymphatic system, where A, B, C and D are lymphoid organs. Select incorrect option regarding the lymphoid organs labelled as A, B, C and D.



a) T cells mature in B. b) B and T cells undergo maturation in C

c) B and T cells undergo proliferation and differentiation in A. d) B cells mature in D.

243. Match column I with column II and select the correct option from codes given below.

Column I	Column II
A. Sporozoites	(i) Infectious form of Plasmodium
B. Filariasis	(ii) Aedes mosquitoes
C. Typhoid	(iii) Wuchereria
D. Chikungunya	(iv) Widal test

a) A-(iv), B-(ii), C-(i), D-(iii) b) A-(iii), B-(iv), C-(ii), D-(i) c) A-(ii), B-(iii), C-(i), D-(iv)

d) A-(i), B-(iii), C-(iv), D-(ii)

244. Which compound is formed by acetylation of morphine?

a) Heroin b) Cocaine c) Tobacco d) Marijuana

245. Enzyme responsible for replication of HIV in macrophages is

a) RNA polymerase b) DNA ligase c) DNA polymerase d) Reverse transcriptase

246. The first line of defence in the immune system is provided by

a) skin and mucous membrane b) inflammatory response c) the complement system

d) none of these

247. Cancer cells are more easily damaged by radiation than normal cells because they are _____

- a) starved of mutation b) undergoing rapid division c) different in structure
d) non-dividing

248. The cells that actually release the antibodies are

- a) Helper T-cells b) Cytotoxic T-cells c) Plasma cells d) Memory cells

249. Match column I with column II and select the correct option from codes given below.

Column I	Column II
A. Leishmania donovani	(i) Malaria
B. Wuchereria bancrofti	(ii) Amoebiasis
C. Trypanosoma gambiense	(iii) Kala azar
D. Entamoeba histolytica	(iv) Sleeping sickness
	(v) Filariasis

- a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(iii), B-(iv), C-(v), D-(ii) c) A-(iii), B-(v), C-(iv), D-(ii)
d) A-(iii), B-(v), C-(ii), D-(i)

250. A person suffering from leukaemia has

- a) tumors in adipose tissue b) increased number of plasma cells
c) increased number of melanocytes d) increased number of WBCs

251. Different species of Mycobacterium cause

- a) Syphilis and Diphtheria b) Whooping cough and leprosy
c) Tuberculosis and leprosy d) Syphilis and gonorrhoea

252. Which of the following is not a cause of transmission of HIV?

- a) Multiple sexual partners b) Sharing infected needles c) Mosquito bite
d) Transfusion of contaminated blood

253. A person likely to develop tetanus is immunised by administering _____

- a) preformed antibodies b) wide spectrum antibiotics c) weakened germs
d) dead germs

254. Acquired Immuno Deficiency Syndrome [AIDS]. Which diagnostic technique will you recommend for its detection?

- a) ELISA b) MRI c) Ultrasound d) WIDAL

255. Retroviruses are implicated as a cause for cancer in humans because they _____

- a) carry gene for reverse transcriptase
b) may carry cellular protooncogenes in their genome
c) may carry v-oncogenes in their genome
d) carry single stranded RNA as their genetic material

256. Match each disease with its correct type of vaccine

(A) Tuberculosis	(i) Harmless virus
(B) Whooping cough	(ii) Inactivated toxin
(C) Diphtheria	(iii) Killed bacteria

(D) Polio	(iv) Harmless bacteria
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- a) (iii),(ii),(iv),(i) b) (iv),(iii),(ii),(i) c) (i),(ii),(iv),(iii) d) (ii),(i),(iii),(iv)
257. Which of the following pairs correctly matches a disease and a pathogen causing it?
a) Typhoid - *Salmonella typhi* b) Pneumonia - *Haemophilus pneumoniae*
c) Malaria - *Ascaris lumbricoides* d) Ringworm - *Entamoeba histolytica*
258. Cancer cells do not exhibit the property of
a) generating tumors b) metastasis c) contact inhibition
d) less number of mitochondrial cristae
259. **Assertion** : Mucus associated lymphoid tissues are specialised immune barrier located on skin.
Reason : These lymphoid tissues are located within tonsils, adenoids and Peyer's patches.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If assertion is true but reason is false.
260. Select the correct statement from the ones given below?
a) Barbiturates when given to criminals make them tell the truth
b) Morphine is often given to persons who have undergone surgery as a pain killer
c) Chewing tobacco lowers blood pressure and heart rate
d) Cocaine is given to patients after surgery as it stimulates recovery
261. If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidences?
a) Serum albumins b) Haemocytes c) Serum globulins d) Fibrinogen in plasma
262. Level of which hormones get elevated by the intake of nicotine?
a) FSH, LH b) Thyroxine, progesterone c) Oxytocin, prolactin
d) Adrenaline, nor-adrenaline
263. Select the correct option showing the life cycle of *Plasmodium*.
a)
Sporozoites (human) → RBCs → liver cells → gametocytes in blood → blood meal, bite (female mosquito) → fertilisation (mosquito) → sporozoites (mosquito)
b)
Sporozoites (human) → liver cells → RBCs → gametocytes in blood → blood meal, bite (female mosquito) → fertilisation (mosquito) → sporozoites (mosquito)

c)

Gametocytes (mosquito) → bite → gametocytes (human) → RBCs → fertilisation (human) → sporozoites blood meal (human) → bite → sporozoites (female mosquito) → multiply (mosquito) → gametocytes (mosquito)

d)

Sporozoites (human) → liver cells → gametocytes in blood → blood meal, bite (female mosquito) → gametocytes multiply (mosquito) → sporozoites (mosquito)

264. In which one of the following pairs of diseases both are caused by viruses?

- a) Tetanus and typhoid b) Whooping cough and sleeping sickness
c) Syphilis and AIDS d) Measles and rabies

265. Due to increasing air-borne allergens and pollutants, many people in urban areas are suffering from respiratory disorder causing wheezing due to _____

- a) inflammation of bronchi and bronchioles
b) proliferation of fibrous tissues and damage of the alveolar walls
c) reduction in the secretion of surfactants by pneumocytes
d) benign growth on mucous lining of nasal cavity

266. Identify the correct pair representing the causative agent of typhoid fever and the confirmatory test for typhoid _____.

- a) Streptococcus pneumoniae/Widal test b) Salmonella typhi/Anthrone test
c) Salmonella typhi/Widal test d) Plasmodium vivax/UTI test

267. Select the correct option to fill up the blanks.

- (i) Diseases which are easily transmitted from one person to another, are called _____ diseases.
(ii) In human body, parasite of malaria initially multiplies within the _____ and then attack the _____.
(iii) _____ is the yellowish fluid secreted by mother during the initial days of lactation.
(iv) _____ and _____ are the primary lymphoid organs.
a) (i) infectious, (ii) bone marrow, thymus, (iii) Colostrum, (iv) Liver cell, RBCs
b) (i) infectious, (ii) liver cell, RBCs, (iii) Colostrum, (iv) Bone marrow, thymus
c) (i) interferon, (ii) bone marrow, thymus, (iii) Colostrum, (iv) Liver cell, RBCs
d) (i) infectious, (ii) liver cell, RBCs, (iii) Colostrum, (iv) Spleen, lymph node

268. Match the terms given in list I with their description in list II and select the correct option from the codes given below.

List I	List II
A. Helper T-cells	1. Cells that are active in production of antibodies.
B. Plasma cells	2. Activate T or B-lymphocyte to become plasma cells
C. Killer T-cells	3. Protein produced by virus infected cell
D. Interferon	4. Combine with antigen causing lysis and release of cytokinins.

- a) A - 4, B-1, C - 2, D -3 b) A - 3, B-2, C - 1, D -4 c) A - 1, B-3, C - 4, D -2
d) A - 2, B-1, C - 4, D -3

269. AIDS was first reported in

- a) USA b) France c) Russia d) India

270. Which one of the following statements is correct?

- a) Benign tumours spread to distant sites. b) Heroin accelerates body functions.
c) Malignant tumours exhibit metastasis.
d) Patients who have undergone surgery are given cannabinoids to relieve pain

271. Match column I with column II and select the correct option from codes given below.

Column I	Column II
A. Amoebiasis	(i) Treponema pallidum
B. Diphtheria	(ii) Houseflies as mechanical carriers
C. Cholera	(iii) DPT vaccine
D. Syphilis	(iv) Oral rehydration therapy

a)

A	B	C	D
(ii)	(i)	(iii)	(iv)

b)

A	B	C	D
(ii)	(iii)	(iv)	(i)

c)

A	B	C	D
(i)	(ii)	(iii)	(iv)

d)

A	B	C	D
(ii)	(iv)	(i)	(iii)

272. Select the correct options to fill up the blanks.

(i) With repeated use of drugs, the tolerance level of receptors present in our body

(ii) Smoking increases _____ content and reduces the concentration of _____ in blood.

(iii) Cannabinoid receptors are present in the _____

(iv) Morphine is a very effective _____ and _____

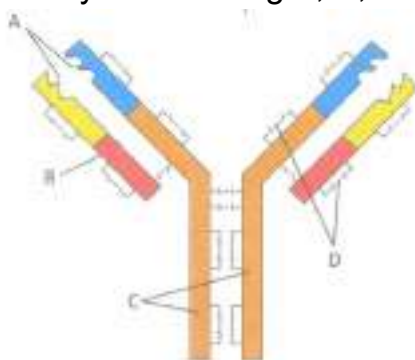
(v) Opioids are extracted from the _____ of poppy plant, Papaver somniferum.

- a) (i) decreases, (ii) CO, CO₂, (iii) brain, (iv) hallucinogen, depressant, (v) latex
b) (i) increases, (ii) CO, haembound oxygen, (iii) brain, (iv) sedative, painkiller, (v) latex
c) (i) decreases, (ii) CO, haembound oxygen, (iii) brain, (iv) sedative, painkiller, (v) latex
d) (i) increases, (ii) CO, haembound oxygen, (iii) heart, (iv) sedative, painkiller, (v) resin

273. AIDS virus has

- a) Single strand DNA b) Double strand DNA c) Single strand RNA
d) Double strand RNA

274. Identify the marking A, B, C and D in the figure given below and select the correct option.



- a) A - antigen binding sites, B - disulphide bonds, C - light chains, D - heavy chains
b) A - light chains, B - heavy chain, C - antigen binding sites, D - disulphide bonds
c) A - disulphide bonds, B - antigen binding site, C - heavy chains, D - light chains
d) A - antigen-binding sites, B - light chain, C - heavy chains, D - disulphide bonds
275. Which one of the following diseases is non-communicable?
a) Diphtheria b) Flu c) Cancer d) Malaria
276. Increased asthmatic attacks in certain seasons are related to _____
a) eating fruits preserved in tin containers b) inhalation of seasonal pollen
c) low temperature d) hot and humid environment
277. The antigen binding site of an antibody is present at
a) the constant region b) the C-terminal c) the variable region
d) between constant and variable region
278. Which of the following is correct regarding AIDS causative agent HIV?
a)
HIV is enveloped virus containing one molecule of single stranded RNA and one molecule of reverse transcriptase
b)
HIV is enveloped virus that contains two identical molecules of single stranded RNA and two molecules of reverse transcriptase
c) HIV is unenveloped retrovirus
d) HIV does not escape but attacks the acquired immune response
279. An auto-immune disease is
a) SCID b) rheumatoid arthritis c) myasthenia gravis d) both (b) and (c)
280. Which of the following diseases is due to an allergic reaction?
a) Goitre b) Hay fever c) Skin cancer d) Enteric fever
281. The intravenous drug abusers are more likely to develop
a) cancer b) AIDS c) malaria d) typhoid
282. A person with sickle cell anaemia is
a) more prone to malaria b) more prone to typhoid c) less prone to malaria
d) less prone to typhoid
283. **Assertion** : Virus-infected cells secrete proteins known as interferons.
Reason : Interferons protect the non-infected cells from bacterial infection.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
284. Which one of the following is categorised as a parasite in true sense ?

- a) The female Anopheles bites and sucks blood from humans
 - b) Human foetus developing inside the uterus draws nourishment from the mother
 - c) Head louse living on the human scalp as well as laying eggs on human hair
 - d) The cuckoo (koel) lays its eggs in crow's nest
285. Hybridoma cells are ____
- a) product of spore formation in bacteria
 - b) hybrid cells resulting from myeloma cells
 - c) nervous cells of frog
 - d) only cells having oncogenes
286. Which one of the following depresses brain activity and produced feelings of calmness, relaxation and drowsiness?
- a) Hashish
 - b) Morphine
 - c) Valium
 - d) Amphetamines
287. Read the following statements about health and select the incorrect one.
- a) Immune system maintains our health.
 - b) Health is defined as a state of complete, physical, mental and social well-being.
 - c) Health increases productivity and economic prosperity
 - d) Health increases infant and maternal mortality
288. Which one of the following immune system components does not correctly match with its respective role?
- a)
Interferons - secreted by virus-infected cells and protect non-infected cells from further viral infection.
 - b)
B- lymphocytes - produce antibodies in response to pathogens into blood to fight with them
 - c) Macrophages - mucus secreting cells that trap microbes entering in the body
 - d) IgA - present in colostrum in early days of lactation to protect infant from diseases
289. Which of the following diseases is transmitted by the bite of the female mosquito vector?
- a) Filariasis
 - b) Amoebiasis
 - c) Typhoid
 - d) Pneumonia
290. Infection of Ascaris usually occurs by :
- a) Tse tse fly
 - b) Mosquito bite
 - c) Drinking water containing eggs of Ascaris
 - d) Eating imperfectly cooked pork
291. Which of the following pathogens causes whooping cough?
- a) Legionella sp.
 - b) Bordetella pertussis
 - c) Vibrio cholerae
 - d) Brucella melitensis
292. **Assertion** : Antiretroviral drugs are very effective in treatment against AIDS.
Reason : AIDS virus is a retrovirus with ssDNA as genetic material.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
 - b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If assertion is true but reason is false.

293. **Assertion:** Inspite of exposure to large number of infectious agents humans are resistive to diseases.

Reason: Humans are able to defend against most of the foreign agents due to the ability to fight disease-causing organisms.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

294. Major factors that cause cancer are

a) oncogenes and polymorphonuclear leucocytes

b) oncogenes and tumour suppressor genes c) MHC genes

d) cellular oncogenes and α -interferons

295. The term 'Health' is defined in many ways. The most accurate definition of the health would be

a) health is the state of body and mind in a balanced condition

b) health is the reflection of a smiling face

c) health is a state of complete physical, mental and social well-being

d) health is the symbol of economic prosperity

296. Diphtheria is caused by _____

a) poisons released by living bacterial cells into the host tissue

b) poisons released from dead bacterial cells into the host tissue

c) poisons released by virus into the host tissues

d) excessive immune response by the host's body

297. Select the mismatched pair.

a)

Name of the plant	Plant part	Drug obtained
Erythroxylon coca	Leaves and young twigs	Cocaine

b)

Name of the plant	Plant part	Drug obtained
Claviceps purpurea	Fruiting bodies	Lysergic acid diethylamide (LSD)

c)

Name of the plant	Plant part	Drug obtained
Cannabis sativa	Leaves, resin and inflorescence	Bhang, hashish

d)

Name of the plant	Plant part	Drug obtained
Thea chinensis	Dried seeds	Mescaline

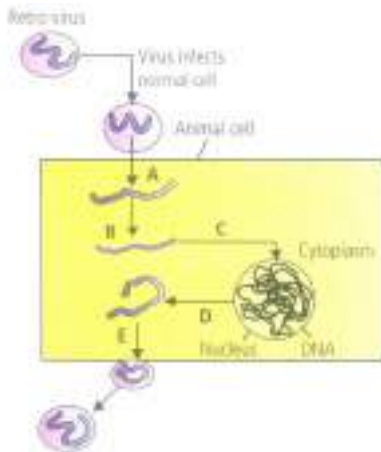
298. AIDS is widely diagnosed by

- a) Widal test b) ELISA c) PCR d) Chromatography

299. AIDS is due to

- a) Reduction in number of helper T-cells b) Reduction in number of killer T-cells
c) Autoimmunity d) Non production of interferons

300. The figure given below shows mode of action of AIDS virus. Identify steps A, B, C, D and E labelled in it.



- a)
A-New viral DNA introduced into cell, B-Viral RNA produced, C-Viral DNA incorporated into host genome, D-New viral DNA, E-New viruses produced
- b)
A-Viral DNA incorporated into host genome, B-Viral DNA, C-New viral RNA introduced, D-Viral RNA produced, E-New viruses produced
- c)
A-Viral RNA introduced, B-Viral DNA, C-Viral DNA incorporated into host genome, D-New viral RNA produced, E-New viruses produced
- d)
A-Viral DNA introduced, B-Viral RNA, C-Viral RNA incorporated into host genome, D-New viral DNA produced, E-New viruses produced



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

STRATIGES FOR ENHANCEMENT IN FOOD PRODUCTION 1

Marks : 1267

1. Which of the following statements does not provide an explanation for hybrid vigour?
 - a) Under certain circumstances, heterozygotes are superior to either possible homozygotes.
 - b) Disease-causing, homozygous recessive phenotypes from either parent are masked in the hybrids.
 - c) Offspring from a hybrid cross usually possess the best of two desirable parents.
 - d) Inherently, hybrids have no deleterious mutations.
2. Which of the following physical mutagen is used for inducing mutations in plants?
 - a) X - rays b) Sodium azide c) Gamma rays d) Ethyl methane sulphonate
3. In virus-infected plants the meristematic tissues in both apical and axillary buds are free of virus because
 - a) the dividing cells are virus resistant b) meristems have anti viral compounds
 - c) the cell division of meristems are faster than the rate of viral multiplication
 - d) viruses cannot multiply within meristem cell(s).
4. What is the best PH of soil for cultivation of plants?
 - a) 3.4-5.4 b) 6.5-7.5 c) 4.5-8.5 d) 5.6-6.5
5. Fill up the blanks by selecting the correct option. In cross-breeding, _____ of one breed are mated _____ with of another breed.
 - a) superior males, normal females b) normal males, superior females
 - c) normal males, normal females d) superior males, superior females
6. Haploid plants are preferred over diploids for mutation study because in haploid _____.
 - a) recessive mutation express immediately b) induction of mutations is easier
 - c) culturing is easier d) dominant mutation express immediately
7. Part of plant used to produce virus free plants is
 - a) Meristem b) Protoplast c) Embryo d) Anther
8. The earliest animal to have been domesticated by man was most likely the _____.
 - a) horse b) cow c) dog d) pig
9. Which of the following statement is/are not correct for single cell protein (SCP)?
 - (i) The biomass is obtained from unicellular microorganisms only.
 - (ii) It provides a protein-rich supplement.
 - (iii) They can be grown easily on materials like waste water from potato processing plants,

straw, manure, sewage, etc.

(iv) It helps to minimise environmental pollution.

(v) SCP has to be processed before use.

a) (i), (iii) and (iv) b) (iii) only c) (v) only d) (i) only

10. Multiple ovulation embryo transfer technology is related to

a) transfer of super embryo b) transfer of super eggs
c) super ovulation and embryo transfer d) both (a) and (b).

11. Major percentage of India's Gross Domestic Product is constituted by

a) industry b) agriculture c) export d) small-scale cottage industry.

12. Which one among the following chemicals is used for causing defoliation of forest trees?

a) Amo-1618 b) phosphon-D c) Malichydrazide d) 2, 4-D

13. Totipotency refers to

a) capacity to generate genetically identical plants
b) capacity to generate a whole plant from any plant cell/explant
c) capacity to generate hybrid protoplasts
d) recovery of healthy plants from diseased plants

14. An egg farmer is experimenting with different feed rations with the aim of increasing his production whilst reducing the cost of the feed per egg produced. The data from two feeding experiments is given below.

Experiment 1

Protein concentration in feed (%)	10	11	12	13	14	15	16
Total vitamin level (mg/kg)	100	100	100	100	100	100	100
Cost of feed ration per 100 hens per day	6.00	7.00	7.50	8.00	8.50	8.75	9.00
Number of eggs per 100 hens per day	70	70	75	80	85	80	80

Experiment 2

Protein concentration in feed (%)	14	14	14	14	14	14	14
Total vitamin level (mg/kg)	50	75	100	125	150	175	100
Cost of feed ration per 100 hens per day	8.00	8.25	8.50	8.75	9.00	9.25	9.50
Number of eggs per 100 hens per day	70	80	85	90	95	95	95

What are the independent variables in each of the two experiments?

a)

Experiment 1	Experiment 2
Maximum daily egg production	Maximum daily egg production

b)

Experiment 1	Experiment 2
Protein concentration in the feed	Total vitamin level in the feed

c)

Experiment 1	Experiment 2
Total vitamin level the in the feed	Protein concentration in feed

d)

Experiment 1	Experiment 2
Cost of feed ration per egg produced	Cost of feed ration per egg produced

15. Biogas is the mixture of gases produced by the microbial activity. The type of the gas produced depends upon-
- a) type of microbes b) type of organic substrate/waste c) size of digester d) 1 & 2 both
16. Which one of the following poultry birds is not an English breed?
- a) Sussex b) Australorp c) Orpington d) Minorca
17. Antibiotics are mostly obtained from
- a) Bacteria b) Actionmycetes c) Cyanobacteria d) (1)&(2)
18. The chances of contracting, bird flu from a property Cooked (above 100°C) chicken and eggs are:
- a) Very high b) High c) Moderate d) None of these
19. Which one of the following is a viral disease of poultry?
- a) Coryza b) New castle disease c) Pasteurellosis d) Salmonellosis
20. Which one of the following is an example of carrying out biological control of pests/diseases using microbes?
- a) Trichoderma sp. against white rust in Brassica b) Nucleopolyhedrovirus against white rust in Brassica c) Bt-Cotton to increase cotton yield d) Ladybird beetle against aphids in mustard
21. An improved variety is
- a) Always superior to the other existing Varieties b) Always inferior to the other existing Varieties c) May be superior to the other existing varieties d) More than one option is correct
22. Which one of the following proved effective for biological control of nematodal disease in plants?
- a) Pisolithus tinctorius b) Pseudomonas cepacia c) Gliocladium virens d) Paecilomyces lilacinus
23. Which of the following animal is not included in livestock?
- a) Pig b) Buffalo c) Goat d) Rhinoceros
24. Which of the following bacterium is associated with production of bioinsecticide is?
- a) Bacillus aubstills b) Bacillus thuringgensis c) Agrobacterium d) Azotobactor
25. The term aquaculture means
- a) Inland fisheries b) Aspergilosis c) marine fisheries d) Both (1) & (3)
26. Zebu is
- a) Bos indicus b) Gailus gallus c) Bubalus bubalus d) Bornbyx mori

27. Modern farmer's can increase is used increase the yield of paddy upto 50% by the use of:-
a) Cyconobacteria b) Rhizobium c) Mycorrhiza d) Farm yard manure
28. Holstein-Friesian, Brown Swiss and Jersey are all well known
a) exotic breeds of cow b) exotic breeds of goat c) exotic breeds of poultry
d) animal husbandry scientists.
29. MOET stands for:
a) Multiple Ovulation and Egg Transfer Technology
b) Multiple Ovary and Embryo Transfer Technology
c) Multiple Ovulation Embryo Transfer Technology d) Method of Egg Transfer Technology
30. Which of the following two matches are incorrect?

Exotic breeds of cattle	Country of origin
(i) jersey	Holland
(ii) Holstein-Friesian	Germany
(iii) Ayrshire	Scotland
(iv) Brown Swiss	Switzerland

- a) (i) and (iii) b) (i) and (ii) c) (ii) and (iii) d) (ii) and (iv)
31. Which of the following is an example of intergeneric hybridization?
a) Triticale b) Raphanobrassica c) Gossypium d) More than one options are correct
32. Which of the following statements is correct regarding nectarless cotton varieties?
a) They do not attract stem sawfly. b) They are produced by mutation breeding.
c) They do not attract bollworms. d) They attract cereal leaf beetle.
33. Hisardale a new breed of sheep developed in punjab by crossing Bikaneri and Merino rams is an example of
a) Outcrossing b) Cross - breeding c) Interspecific Hybridisation d) Out breeding
34. The term 'totipotency' refers to the capacity of a
a) cell to generate whole plant b) bud to generate whole plant c) seed to germinate
d) cell to enlarge in size.
35. Pusa Sadabahar is _____resistant variety of chilli.
a) Bacteria b) Fungi c) Virus d) Nomatode
36. Three crops that contribute maximum to global food grain production are _____.
a) Wheat, rice and maize b) Wheat, rice and barley c) Wheat, maize and sorghum
d) Rice, maize and sorghum
37. Which plant will loss its economic value, if its fruits are produced by induced parthenocarpy?
a) Grape b) Pomegranate c) Orange d) Banana
38. Most of our crop plants are _____.
a) autopolyploid in origin b) allopolyploid in origin c) mixed genotypic in origin
d) heterozygous in origin
39. Read the following statements and select the incorrect one

- a) Semen is preserved for artificial insemination by heating.
- b)
- Mating of animals within the same breed, but having no common ancestors on either side of their pedigree upto 4 - 6 generations is called as outcrossing.
- c) Example of interspecific hybridisation is mule
- d) Hinny is a hybrid between the female ass and stallion.
40. Which of the following is an example of a cross-breed?
- a) Mule b) Hilsa c) Hisardale d) Sahiwal
41. Who is credit with identifying petrocrops?
- a) M.S.Swaminathan b) M.Calvin c) H.Krebs d) N.Borlaug
42. A petroleum plant is :
- a) Euphorbia Lathyrus b) Acacia arabica c) Pinus Roxburgh d) Prosopis cineria
43. Outbreeding is an important strategy of animal husbandry because it:
- a) Helps in accumulation of superior genes b) Is useful in producing purelines of animals
- c) Is useful in overcoming inbreeding depression
- d) Exposes harmful recessive genes that are eliminated by selection
44. Cod liver oil is rich in
- a) Vitamin B b) Vitamin K c) Vitamin A and D d) Vitamin C
45. **Assertion:** Beehives are kept in crop field during flowering period.
Reason: Bees are pollinating agents.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
- If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
46. The term "breed" refers to
- a) a group of animals not related by descent but similar in most characters
- b) a group of animals related by descent and similar in most characters
- c) a group of animals related by descent but have almost different characteristics
- d) a group of animals neither related by descent nor have similar characteristics.
47. Which of the following statements is not correct regarding inbreeding?
- a) It is the breeding between animals of the same breed. b) It decreases homozygosity.
- c) It exposes harmful recessive genes. d) It helps in accumulation of superior genes.
48. Which one of the following is an exotic carp species?
- a) Labeo rohita b) Cyprinus carpio c) Labeo bata d) Cirrhinus mrigala
49. Conventional method of plant breeding includes
- a) Hybridization b) Inbreeding c) Mutation breeding d) outbreeding
50. Which one of the following is a wrong matching of a microbe and its industrial product, while the remaining three are correct?

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- a) *Aspergillus niger* - citric acid b) Yeast - Statins c) *Acetobacter aceti* - acetic acid
d) *Clostridium butylicum* - lactic acid.

51. Protoplast is

- a) another name for protoplasm b) an animal cell c) a plant cell without a cell wall
d) a plant cell

52. Which of the following plant species you would select for the production of bioethanol?

- a) *Zea mays* b) *Pongamia* c) *Jatropha* d) *Brassica*

53. The microorganism grown on molasses is used for production of citric acid in industries?

- a) *Saccharomyces* b) *Rhizopus niger* c) *Aetobacter* d) *Lactobacillus*

54. High milk yielding varieties of cows are obtained by _____.

- a) superovulation b) artificial insemination c) use of surrogate mother
d) All of the above

55. Which of the following is incorrectly matched?

a)

Disease	Causative Organism
Black rot of crucifers	Bacteria

b)

Disease	Causative Organism
Brown rust of wheat	Fungi

c)

Disease	Causative Organism
Late blight of potato	Virus

d)

Disease	Causative Organism
Red rot of sugarcane	Fungi

56. Study the following statements regarding inbreeding and select the incorrect ones.

- (i) The inbreeding strategies allow the desirable qualities of two different breeds to be combined.
(ii) It increases homozygosity.
(iii) It also helps in elimination of less desirable genes.
(iv) Continued inbreeding increases fertility and productivity.
a) (i) and (ii) b) (iii) and (iv) c) (ii) and (iii) d) (i) and (iv)

57. Select the option showing the correct sequential steps to produce a new genetic variety of a crop.

a)

Selection of parents → Hybridisation of selected parents → Germplasm collection → Selection of superior recombinants → Testing and release of new varieties

b)

Germplasm collection → Selection of parents → Hybridisation of selected parents → Selection of superior recombinants → Testing and release of new varieties

c)

Selection of superior recombinants → Germplasm collection → Hybridisation of selected parents → Selection of parents → Testing and release of new varieties

d)

Germplasm collection → Selection of parents → Hybridisation of selected parents → Testing and release of new varieties → Selection of superior recombinants

58. Which part of the tobacco plant is infected by *Meloidogyne incognita*.

- a) Flower b) Leaf c) Stem d) Root

59. The new varieties of plants are produced by _____.
a) selection and hybridisation b) selection and introduction c) mutation and selection
d) introduction and mutation
60. Which of the following is used to manufacture ethanol from starch:-
a) Penicillin b) Saccharomyces c) Azotobactor d) Lactobacillus
61. Which of the following are the species that are crossed to give sugarcane varieties with high sugar, high yield, thick stems and ability to grow in the sugarcane belt of North India?
a) Saccharum robustum and Saccharum officinarum
b) Saccharum barberi and Saccharum officinarum
c) Saccharum sinense and Saccharum officinarum
d) Saccharum barberi and Saccharum robustum
62. Which of the following shows the correct sequence of steps of plant tissue culture?
a)
Sterilisation → Hardening → Selection of explant → Inoculation → Regeneration → Plantlet transfer
b)
Selection of explant → Inoculation → Regeneration → Sterilisation → Hardening → Plantlet transfer
c)
Selection of explant → Sterilisation → Inoculation → Regeneration → Hardening → Plantlet transfer
d)
Hardening → Sterilisation → Selection of explant → Inoculation → Regeneration → Plantlet transfer
63. Which of the following enhances or induces fusion of protoplasts?
a) Polyethylene glycol and sodium nitrate b) IAA and kinetin c) IAA and gibberellins
d) Sodium chloride and potassium chloride
64. Cheese and yoghurt are products of-
a) Pasteurisation b) distillation c) Dehydration d) Fermentation
65. Cybird is a result of
a) Fusion of cytoplasm and nuclei of the two somatic cells
b) Fusion of cytoplasm of two somatic cell but the nuclei remain unfused
c)
Fusion of cytoplasm of two somatic cells occurs but the nucleus of one cell persists and the nucleus of second cell degenerates.
d)
Fusion of cytoplasm of two somatic cells takes place but one part of the nucleus of one cell fuses with the entire nucleus of second cell
66. In pultr, coccidiosis is caused by
a) Virus b) Fungus c) Gelminth parasite d) Protozoan
67. A somatic hybrid between potato and tomato is named as

a) bomato b) mopato c) pomato d) topamo

68. Consider the following three statements and select the correct option stating which ones are true (T) and which ones are false (F).

(i) Hybridisation is crossing of two or more types of plants for bringing their traits together in progeny.

(ii) Semi-dwarf rice varieties were derived from IR-8 and Taichung Native -1.

(iii) Hybrid breeding have led to the development of several high yielding varieties resistant to water stress.

a)	b)	c)	d)
(i)(ii)(iii)	(i)(ii)(iii)	(i)(ii)(iii)	(i)(ii)(iii)
F T T	T T F	F T F	T T T

69. Himgiri Variety of wheat is resistant to

a) White rust b) Black rot c) Bacterial blight d) Leaf and stripe rust

70. The most common species of honey bee reared in hives for commercial production is

a) Apis Florea b) Apis dorsata c) Apis indica d) Apis mellifera

71. Which one of the following shows maximum genetic diversity in India?

a) Groundnut b) Rice c) Maize d) Mango

72. Which of the following Microorganisms use for swiss cheese

a) Propionibacterium b) Geotrichum c) Penicillium d) Streptococcus

73. The technology of biogas production was developed India mainly due to the efforts of

a) IARI b) KVIC c) both (1) and (2) d) WHO

74. Single cell protein can be obtained from

a) bacteria b) algae c) fungi d) all of these.

75. 33 percent of India's (Gross Domestic Product) comes from

a) export b) small-scale cottage industries c) industry d) agriculture

76. Inbreeding for five generations led to production of homozygous transgenic mice. However, these homozygous males or females were infertile. Which of the following approaches is most preferable and economical to obtain heterozygous transgenic animals continuously?

a) More transgenic founder (1st animal) should be generated.

b)

Crossing (breeding) of transgenic mice with wild-type mice in earlier generations should be done for continued production of transgenic heterozygous offsprings.

c) Inbreeding should be avoided after 5th generation.

d)

Homozygous transgenic mice should be mated with heterozygous transgenic mice for continued production of transgenic heterozygous offsprings.

77. The Nobel Laureate, who developed semi-dwarf wheat varieties in Mexico was

a) Norman E. Borlaug b) Herbert Boyer c) William Harvey d) Typhoid Mary

78. Which of the following plants are used as green manure in crop fields and in sandy soils?

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- a) *Dichanthium annulatum* and *Azolla nilotica* b) *Crotalaria juncea* and *Alhagi camelorum*
c) *Calotropis procera* and *Phyllanthus niruri* d) *Saccharum munja* and *Lantana camara*
79. An explant is
a) dead plant b) part of the plant c) part of the plant used in tissue culture
d) part of the plant that expresses a specific gene
80. Testing of new cultivar is done in the farmers field for at least _____ growing seasons
a) Two b) One c) Three d) Five
81. Which one of the following is used in the making of bread:
a) *Rhizopus stolonifer* b) *Saccharomyces cerevisiae* c) *Zygosaccharomyces ludwigii*
d) *Saccharomyces ludwigii*
82. Which one of the following combination would a sugarcane farmer look for in the sugarcane crop?
a) Thick stem, long internodes, high sugar content and disease resistant
b) Thick stem, high sugar content and profuse flowering
c) Thick stem, short internodes, high sugar content, disease resistant
d) Thick stem, low sugar content, disease resistant
83. Which one of the following is a breed of cattle?
a) Ayrshire b) Ghagus c) Kadaknath d) Scampi
84. Most of the petrocrops belong to family
a) Leguminoase b) Euphorbiaceae c) Rutaceae d) Malvaceae
85. Match column I (crop) with column II (corresponding disease resistant variety) and select the correct option from the given codes.
- | Column I | Column II |
|-------------|----------------------|
| A. Cowpea | (i) Himgiri |
| B. Wheat | (ii) Pusa Komal |
| C. Chilli | (iii) Pusa Sadabahar |
| D. Brassica | (iv) Pusa Swarnim |
- a) A-(ii), B-(iv), C-(i), D-(iii) b) A-(i), B-(iii), C-(iv), D-(ii) c) A-(iv), B-(ii), C-(iii), D-(i)
d) A-(ii), B-(i), C-(iii), D-(iv)
86. Aquaculture does not include
a) prawns b) fishes c) silkworms d) shell fishery.
87. Read the following statement having two blanks (A and B)
"A drug used for _____(A)_____ -patients is obtained from a species of the organism _____(B)_____ -." The one correct option for the two blanks is:
- a) _____ b) _____ c) _____
- | | | | | | |
|----------------|----------------------|----------------|----------------------|------------------|----------------------|
| Blank-A | Blank-B | Blank-A | Blank-B | Blank-A | Blank-B |
| AIDS | - <i>Pseudomonas</i> | Heart | - <i>Penicillium</i> | Organ-transplant | - <i>Trichoderma</i> |
- d) _____
- | | |
|----------------|-------------------|
| Blank-A | Blank-B |
| Swine flu | - <i>Monascus</i> |
88. Contributor of India and China to world farm produce is only:

- a) 5% b) 10% c) 15% d) 25%
89. A certain type of grass has a diploid chromosome number of 8. A similar species of grass has a diploid chromosome number of 10. Interspecific hybridisation between the two species results in sterile hybrids that can, nonetheless, reproduce vegetatively. The diploid chromosome number of these hybrids would be
a) 9 b) 16 c) 18 d) 20
90. Keeping beehives in crop fields during flowering period increases
a) crop yield b) honey yield c) weeds yield d) both (a) and (b).
91. What is the objective of the crucial step to the success of breeding?
a) Collection of variability b) Selection of parents
c) Selection process among the progeny of the hybrids
d) Testing and release of new cultivars
92. 'Lean meat' is considered to be of high quality because it has
a) lesser but easily digestible protein b) lesser lipid content
c) more fat that makes the meat softer
d) longer table life due to lesser chances of infection.
93. Lactic acid bacteria (LAB) grow in milk and convert it to curd and also improve its nutritional quality by increasing:-
a) Vitamin A b) Vitamin B₁₂ c) Vitamin B₆ d) Vitamin C and A
94. Artificial breeding of cattle is brought about by
a) artificial insemination b) super ovulation and embryo transplantation c) MOET
d) all of these
95. In livestock breeding experiments, which of the following stages is transferred to surrogate mothers?
a) Unfertilised eggs b) Fertilised eggs c) 8 to 32 celled embryo d) Frozen semen
96. In order to obtain virus-free plants through tissue culture the best method is _____.
a) Embryo rescue b) Anther culture c) Meristem culture d) Protoplast culture
97. The drug Cyclosporin used for organ transplant patients is obtained from is
a) Bacterium b) Fungus c) Virus d) Plant
98. Which one of the following is a case of wrong matching.
a) Somatic hybridisation - Fusion of two diverse cells
b) Vector DNA - Site for t - tRNA synthesis.
c) Micropropagation - in vitro production of plants in large numbers.
d) Callus - Unorganised mass of cells produced in tissue culture
99. Which of the following is an improved variety of chicken?
a) Jersey b) Leghorn c) Himgiri d) Kalyan Sona
100. Bull semen of artificial insemination is stored in
a) Ice b) Liquid carbon dioxide c) Liquid oxygen d) Liquid nitrogen

101. 250 g of *Methylophilus methylotrophus* can be expected to produce _____ tonnes of proteins.
a) 15 b) 25 c) 40 d) 50
102. More than 70 percent of livestock population is in
a) Denmark b) India c) China d) India and China
103. Cellular totipotency is demonstrated by _____.
a) only bacterial cells b) only gymnosperm cells c) all plant cells d) all eukaryotic cells
104. Which one of the following is a marine fish?
a) Rohu b) Hilsa c) Catla d) Common carp
105. Which of the following is not true?
a) Fish meal is rich source of protein for cattle poultry
b) Fish meal is produced from the non - edible parts of fishes
c) Silver revolution is increases in fish production d) Shagreen is the skin of shark
106. The term "inbreeding depression" is related to:
a) increased fertility and productivity b) increased milk production
c) reduced fertility and productivity d) reduced milk production.
107. Which of the following procedures are followed in dairy farm management?
(i) Regular inspections and visits by veterinary doctors.
(ii) Usage of manure to increase crop yields.
(iii) Adequate environmental condition is provided.
(iv) Weeding away unproductive and harmful plants from the brood house.
a) (i) and (ii) b) (i) and (iii) c) (iii) and (iv) d) All of these
108. Biogas produced by anaerobic fermentation of waste biomass consists of:
a) methane b) traces of H_2 , H_2S and N_2 c) CO_2 d) all of these
109. The enzymes required to obtain protoplast from a plant cell are
a) cellulase b) pectinase c) chitinase d) both (a) and (c).
110. *Trichoderma* has proved a useful microorganism for
a) Gene transfer in higher plants b) biological control of soil-borne plant pathogens
c) Bioremediation of contaminated soils d) reclamation of wastelands
111. Many attempts to improve livestock in the tropics have been made, mainly by 'upgrading' through crossbreeding them with temperate breeds. The major problems faced during the failed cattle breeding are
a)
the breeding programmes have been too complicated in terms of logistics, technology and requirements of resources without considering the infrastructure available.
b)
indiscriminate crossbreeding of indigenous breeds with exotic breeds without enough consideration of environmental conditions for production.

- c)
lack of analysis of the different socio-economic and cultural roles that livestock play in each situation, usually leading to wrong breeding objectives and neglect of the potentials of various indigenous breeds of livestock.
- d) All of these.
112. A collection of all the alleles of all the genes of a crop plant is called
a) germ plasm collection b) protoplasm collection c) herbarium d) somaclonal collection
113. India's wheat yield revolution in the 1960s was possible primarily due to _____.
a) hybrid seeds b) increased chlorophyll content
c) mutations resulting in plant height reduction d) quantitative trait mutations
114. **Assertion:** In MOET, hormones with progesterone-like activity are given to the cow for inducing superovulation.
Reason: After mating, the embryos at 4 - 6 celled stage are recovered and transferred to surrogate mothers.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
115. Frieswal is Crossbreed of
a) Brown swiss and sahiwal b) Tharparkar and Holstein Friesian
c) Holstein Friesian x sahiwal d) Jersey x sahiwal
116. Clonal selection for crop improvement is done in
a) Aruna and NP 836 b) PV - 18 and kalyan sona c) HUW - 468 and atomita - 2
d) kufri safed potato
117. Fish flour is rich in
a) Fat b) proteins c) Vitamins d) Minerals
118. Maize generates resistance against stem borers by having
a) low aspartic acid, high nitrogen and sugar content
b) low aspartic acid and sugar but high nitrogen content
c) high aspartic acid and nitrogen but low sugar content
d) high aspartic acid, low nitrogen and sugar content.
119. Bacillus anthracis causes
a) Rhinderpest b) Tick fever c) Anthrax d) Diarrhoea

120. A mule is produced by the interspecific hybridisation between



- a) Hisardale and merino rams b) male donkey and a mare
c) female donkey and a male horse d) Merino ram and Bikaneri ewe.
121. Recently Govt of India has allowed mixing of alcohol in petrol. What is the amount association with the water fern Azolla is:
a) Anabaena b) Tolypothrix c) Chlorella d) Nostac
122. Yellow mosaic virus resistant variety "Parbhani Kranti" belongs to:
a) bhindi b) chilli c) barley d) cauliflower
123. Match column I with column II and select the correct answer from the given codes.
- | Column I | Column II |
|-------------------|---------------------------------|
| A. Wax | (i) Interspecific hybridisation |
| B. Pollinator | (ii) Micropropagation |
| C. Mule | (iii) Bee |
| D. Tissue culture | (iv) Apiculture |
- a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(iv), B-(iii), C-(i), D-(ii) c) A-(ii), B-(i), C-(iii), D-(iv)
d) A-(iv), B-(i), C-(iii), D-(ii)
124. The silkworm silk is the product of _____.
a) cuticle of the larva b) cuticle of the adult c) salivary gland of the larva
d) salivary gland of the adult
125. Which of the following plays a role in indigenous system of medicine?
a) Plant breeding b) Fisheries c) Apiculture d) MOET
126. Triticale has been evolved by intergeneric hybridisation between _____.
a) wheat and rye b) wheat and rice c) rice and maize d) wheat and Aegilops
127. Aquaculture is the rearing and management of
a) molluscs and crustaceans b) only freshwater fishes
c) economically useful aquatic plants and animals d) only aquatic plants
128. Which of the following is a draught breed of Indian cattle?
a) Malvi b) Sahiwal c) Gir d) Deoni
129. Crossing of individuals of two different species to produce a hybrid is called
a) interspecific hybridisation b) intervarietal hybridisation c) intergeneric hybridisation
d) intravarietal hybridisation

130. Given below are a few statements regarding somatic hybridisation. Choose the correct statements.
- (i) Protoplasts of different cells of the same plant are fused.
 - (ii) Protoplasts from cells of different species can be fused.
 - (iii) Treatment of cells with cellulase and pectinase is mandatory.
 - (iv) The hybrid protoplast contains characters of only one parental protoplast.
- a) (i) and (iii) b) (i) and (ii) c) (i) and (iv) d) (ii) and (iii)
131. **Assertion:** Loss of vigour called inbreeding depression occurs when inbreeding is continued for many generations.
- Reason:** Quarantine can be done to overcome the harmful effects of inbreeding depression.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
132. The most likely reason for the development of resistance against pesticides in insects damaging a crop is _____.
a) random mutations b) genetic recombination c) directed mutations
d) acquired heritable changes
133. Of the world's top five crops (in terms of annual production)
a) three belong to poaceae (Gramineae), one to Leguminosae, one to Solanaceae
b) four belong to poaceae, one to Leguminosae
c) our belong to Poaceae, one to Solanaceae d) All five belong to poaceae
134. The world's highly prized wool yielding 'Pashmina' breed is _____.
a) goat b) sheep c) goat - sheep cross d) Kashmir sheep-Afghan sheep cross
135. Reason of fast speciation in present-day crop plants is _____.
a) mutation b) isolation c) polyploidy d) sexual reproduction
136. What strategy would you suggest if a person wants to evolve a pure line in an animal?
a) Cross-breeding b) Inbreeding c) Out-breeding d) Artificial insemination
137. Resistance to jassids in cotton plants and to cereal leaf beetle in wheat plants is due to
a) biochemical characters b) physiological characters c) morphological characters
d) none of these
138. In tissue culture medium, the embryoids formed from pollen grains is due to _____.
a) cellular totipotency b) organogenesis c) double fertilisation d) test - tube culture
139. Tissue culture is used for
a) Production of virus free plants b) Induction of polyploidy c) Phytoremediation
d) Formation of sexual hybrid
140. A technique of micropropagation is: _____.
a) Somatic embryogenesis b) Protoplast fusion c) Embryo rescue
d) Somatic hybridization
141. Biofortification refers to the development of crop plants which are

- a) resistant to disease b) resistant to insect pests c) having improved nutritional quality
d) having improved iron content.
142. In plant breeding programmes, the entire collection (of plants/seeds) having all the diverse alleles for all genes in a given crop is called _____.
a) cross-hybridisation among the selected parents b) evaluation and selection of parents
c) germplasm collection d) selection of superior recombinants.
143. Biogas consists of :
a) Carbon monoxide, methane and hydrogen b) Carbon dioxide, methane and hydrogen
c) Carbon monoxide, ethane and hydrogen d) Carbon dioxide, ethane and hydrogen
144. All of the following is apart of part of IPM (Integrated Pest Management) except-
a) Use of resistant varieties b) Use of crop rotation
c) Biological & Mechanical control of pests
d) Regular use of high dose of pesticides from beginning to end of the crop
145. Agriculture in india accounts for _____ of india's GDP and employs nearly _____ of population
a) 62%,33% b) 33%,62% c) 67%,33% d) 32%,67%
146. Select the correct match-
a) Aspergillus niger-Acetic acid b) Streptokinase-Immunosuppressive
c) Cyclosporin-A-Clot buster d) Statins-Cholesterol lowering agent
147. During anaerobic digestion of organic waste, such as producing biogas, which one of the following is left undergrabs:-
a) Lipids b) Lignin c) Hemi-cellulose d) Cellulose
148. Meristem culture is the culture of
a) axillary or apical shoot meristems b) anthers c) plant seeds d) young embryos.
149. Rate limiting material in biogas production is:
a) Methane b) Cellulose c) Starch d) Acetic acid
150. Several South Indian states raise 2-3 crops of rice annually. The agronomic feature that makes this possible is because of
a) shorter rice plant b) better irrigation facilities c) early yielding rice variety
d) disease resistant rice variety
151. Which of the following statements is not correct regarding plant breeding?
a) It reduces the dependence on fungicides and bactericides.
b) It provides somaclonal variation c) It is independent of germ plasm collection.
d) It involves self-pollination of plants.
152. Fill up the blanks in the following paragraph by selecting the correct option.
Inbreeding increases _____.(i)____. Thus inbreeding is necessary if we want to evolve a _____(ii)_____ in any animal. Inbreeding exposes harmful _____(iii)_____enes that are eliminated by selection.
a) (i) heterozygosity, (ii) pure line, (iii) dominant
b) (i) heterozygosity, (ii) breed, (iii) recessive

- c) (i) homozygosity, (ii) pure line, (iii) recessive d) (i) homozygosity, (ii) breed, (iii) dominant
153. A viral disease of poultry is
a) Coryza b) New Castle disease c) Pasteurellosis d) salmonellosis
154. Pasteurisation of milk involve heating for _____.
a) 60 min at about 90°C b) 30 min at about 50°C c) 30 min at about 65°C
d) 60 min at 100°C
155. Continued inbreeding, especially close inbreeding generally results in
a) inbreeding depression b) inbreeding stimulation c) inbreeding hybridisation
d) inbreeding mutation
156. Ladybird is useful to get rid of
a) Aphids b) Mosquitoes c) Boll worm d) Jassids
157. Milk is changed into curd by-
a) Bacillus Megatherium b) Acetobactor aceti c) Xanthomonas citri
d) Lactobacillus acidphilus
158. **Assertion:** Wild varieties of crop plants must be conserved.
Reason: Genome of wild plants serve as important resource for selection of desired genes like genes for pest resistance.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
159. Which of the following diseases is caused by bacteria?
a) Tobacco mosaic b) Black rot of crucifers c) Red rot of sugarcane
d) Late blight of potato
160. Black rust of wheat is caused by
a) Puccinia b) Albugo c) Ustilago d) Cystopus
161. Which part would be most suitable for raising virus-free plants from micropropagation?
a) Bark b) Vascular tissue c) Meristem d) Node
162. High milk yielding cross bred Frieswal cow is the product of
a) Brown Swiss × Sahiwal b) Friesian × Sahiwal c) Holstein × Tharparkar
d) Brown Swiss × Red sindhi.
163. A disease of poultry is
a) Anthrax b) Ranikhet c) Foot and mouth disease d) Pebrine
164. **Assertion:** Single cell proteins can help to meet increasing demands of growing population.
Reason: SCP now can be produced in high amount commercially, using low cost substrates.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

165. Before European invader which vegetable was absent in India?
a) Potato and Tomato b) Sirnla mirch and Brinja c) Maize and Chichinda
d) Brinjal and lady's finger
166. A plant cell without cell wall is called
a) proplast b) protoplast c) nucleoplasm d) explant
167. To obtain virus - free healthy plants from a diseased one by tissue culture technique, which part/part of the diseased plant will be taken _____.
a) Apical meristem only b) Palisade parenchyma c) Both apical and axillary meristems
d) Epidermis only
168. To isolate protoplast, one needs
a) pectinase b) cellulase c) both pectinase and cellulase d) chitinase
169. Which one of the following is not a fungal disease?
a) Rust of wheat b) Smut of Bajra c) Black rot of crucifers d) Red rot of sugarcane
170. A pure line is obtained through
a) Mass selection b) Hybridisation c) Domestication d) Inbreeding
171. **Assertion:** Artificial insemination is very economical method.
Reason: Fewer sperms are required in artificial insemination.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
172. The term "antibiotic" was coined by:-
a) Edward Jenner b) Louis Pasteur c) Salman waksman d) Alexander Fleming
173. First fermented acid is
a) Gluconic acid b) Lactic acid c) Fumaric acid d) All the above
174. Compared to a bull a bullock is docile because of _____.
a) higher levels of cortisone b) lower levels of blood testosterone
c) lower levels of adrenaline/noradrenaline in its blood d) higher levels of thyroxine.
175. A good breed of cattle means
a) It should have high yielding potential b) It should have resistance to diseases
c) It should consume less amount of water d) Both (1) & (2)
176. By which method was a new breed, Hisardale, of sheep formed by using Bikaneri ewes and Marino rams?
a) Crossbreeding b) Inbreeding c) Outcrossing d) Mutational breeding
177. Which one of the following is not true about antibiotics:
a) First, antibiotic was discovered by Alexander Fleming.
b) The term 'antibiotic' was coined by S.Waksman in 1942.
c) Each antibiotic is effective only against one particular kind of germ .
d) Some persons can be only against one particular kind of germ.

178. Inbreeding is carried out In animal husbandry because it
 a) increases vigour b) improves the breed c) increases heterozygosity
 d) increases homozygosity.
179. Which one of the following pairs is mismatched.
 a) Apisindica - honey b) Kenia lacca - lac c) Bombyx mori - silk d) Pilaglobosa - Pearl
180. Homozygous pure lines in cattle can be obtained by _____.
 a) mating of unrelated individuals of same breed.
 b) mating of individuals of different breed. c) mating of individuals of different species
 d) mating of related individuals of same breed.
181. Which of the following is not correctly matched?

Common Name	Scientific name
(i) Bombay duck	Harpadon
(ii) Pomphret	Stromateus
(iii) Salmon	Anguilla
(iv) Sardine	Aluitheronema
(v) Singhi	Heteropneustes

- a) (ii) and (v) b) (iii) and (v) c) (i) and (iii) d) (iii) and (iv)
182. Given below are the three statements each with one or two blanks. Select the option which correctly fills up the blank in any two statements.
 A. Inbreeding helps in accumulation of ____ (i) _____ and elimination of ____ (ii) _____.
 B. In MOET a cow is administered hormones, with ____ (i) ____ Like activity, to induce follicular maturation and super ovulation.
 C. Hisardale is a new breed of sheep developed in Punjab by crossing ____ (i) ____ and ____ (ii) _____.
 A - (i) less desirable genes, (ii) superior genes
 a) B - (i) FSH
 A - (i) superior genes, (ii) less desirable genes B - (i) LH
 b) C - (i) Bikaneri ewes (ii) Marino rams c) C - (i) Sahiwal ewes, (ii) Deoni rams
 B - (i) progesterone
 d) C - (i) Kankrej ewes, (ii) Dangi rams

183. In which of the following options, the different breeds are not correctly placed?

a)

Breeds of buffalo	Breeds of cattle
Murrah	Hallikar

b)

Breeds of buffalo	Breeds of cattle
Bhadawari	Kankrej

c)

Breeds of buffalo	Breeds of cattle
Mehsana	Tharparker

d)

Breeds of buffalo	Breeds of cattle
Chegu	Jaffarabadi

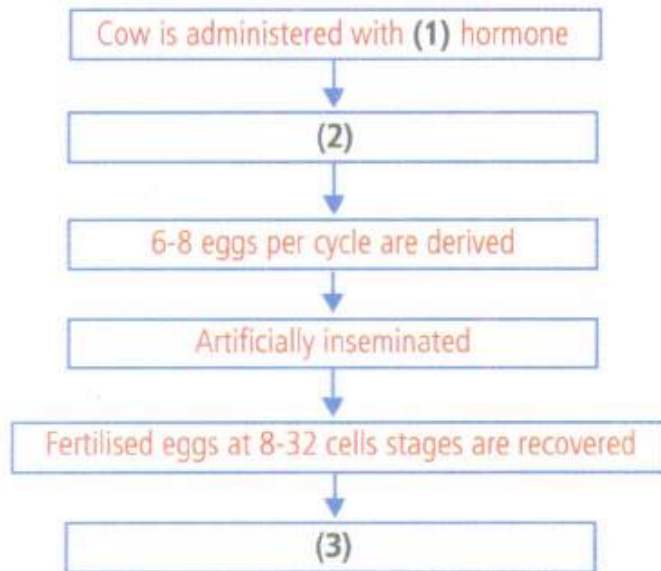
184. Integrated pest management (IPM) is based on :-
 a) Biological control of pest b) Mechanical control c) Carefully timed used of pesticides
 d) All the above
185. Meristem culture is used

- a) to produce disease free plants b) in germplasm conservation
c) in rapid clonal multiplication d) all of these
186. Fill the blanks in the following statements by selecting the correct option.
(i) All hybrids of poultry are produced by _____ inbred stocks.
(ii) Super hybrids are obtained when genetically _____ parents are used in the cross.
(iii) A _____ is produced from a cross between female horse (male) and male donkey
a) (i) mating, (ii) same, (iii) mule b) (i) crossing, (ii) same, (iii) hinny
c) (i) crossing, (ii) different, (iii) mule d) (i) mating, (ii) different, (iii) hinny
187. Interspecific hybridisation is the mating of:
a) Animals within same breed without having common ancestors
b) Two different related species c) superior males and females of different breed
d) More closely related individuals within same breed for 4-6 generation
188. Which statement is correct about centre of origin of plant?
a) More diversity in improved varieties b) Frequency of dominant gene is more
c) Climatic conditions more favourable d) None of these
189. BGA is chiefly used as biofertilizer in the crop of
a) Wheat b) Gram c) Mustard d) Paddy
190. Given below are four statements (A-D) each with one or two blanks. Select the option which correctly fills up the blanks in any two statements.
(A) Multiple ovulation _____ (i) _____ transfer technology is for _____ (ii) _____ improvement.
(B) In it a cow is administered _____ (i) _____ to induce follicular maturation and _____ (ii) _____ ovulation.
(C) Instead of one egg per cycle, _____ (i) _____ eggs are produced through it.
(D) The fertilised _____ (i) _____ at _____ (ii) _____ celled stages are recovered non-surgically and transferred to surrogate mothers
a) (A)-(i) zygote, (ii) pureline; (B)-(i) oestrogen, (ii) poly
b) (A)-(i) embryo, (ii) herd; (D)-(i) zygote, (ii) 4-6 c) (C)-(i) 6-8; (D)-(i) eggs, (ii) 4-8
d) (B)-(i) FSH, (ii) super; (C)-(i) 6-8
191. **Assertion:** Biofortification is the most practical aspect to improve health of the people.
Reason: Biofortification is breeding crops with higher levels of vitamins or minerals or higher proteins and healthier fats.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
192. An important germplasm storing center in india is
a) CDRI b) FRI c) ICRISAT d) NEERI
193. Apis dorsata is
a) little bee b) rock bee c) European bee d) Indian bee

194. Hisardale is a new breed of sheep developed in Punjab by crossing
a) Rhode Island ram and White leghorn ewe b) Cochin ram and Ghagus ewe
c) Merino ram and Bikaneri ewe d) Assel ram and White leghorn ewe
195. Which endangered animal is the source of world's finest lightest, warmest and most expensive wool the shahtoosh?
a) Chiru b) Nilgai c) Cheetal d) Kashmiri goat
196. Which of the following should be used as an explant to generate a disease free plant?
a) Anther b) Ovary cell c) Shoot tip d) Young embryo
197. Which of the following is a symbiotic nitrogen fixer
a) Azolla b) Glomus c) Azotobacter d) Frankia
198. Read the following statements regarding poultry farm management.
(i) Poultry birds include chicken, ducks, turkey and geese.
(ii) Brooder house should be crowd-free, rain proof and protected from predators.
(iii) The most common egg-type variety used for commercial production throughout the world is single comb white leghorn and its various strains.
(iv) Approximately 14 to 16 hours of light including daylight are required for optimum egg production.
Which of the above statements are correct?
a) (iii) and (iv) b) (i), (ii) and (iii) c) (i), (iii) and (iv) d) (i), (ii), (iii) and (iv)
199. Semi - dwarf variety of wheat introduced in india was
a) Jaya b) Ratna c) Sonalika d) IR - 8
200. Which of the following is not used as a biopesticide?
a) Trichoderma harzianum b) Nuclear Polyhedrosis Virus (NPV)
c) Xanthomonas campestris d) Bacillus thuringiensis
201. The use of predator to control a pest is called
a) Genetic engineering b) Biological control c) Chemical control d) Artificial control
202. **Assertion:** Phenotypic superiority of hybrid over either of its parents in one or more traits is termed hybrid vigour.
Reason: Suppression of expression of recessive harmful genes occurs in heterozygotes.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
203. Which group is not related with, petroplantation:
a) Euphorbiaceae b) Asclepiadiaceae c) Asclepiadaceae d) Lamiaceae
204. Which one of the following products of apiculture is used in cosmetics and polishes?
a) Honey b) Oil c) Wax d) Royal jelly
205. The entire collection of plants or seeds having all the diverse alleles for all genes in a given crop is
a) Germplasm collection b) Gene flow c) Gene library d) Gene pool

206. Which one is not used in the production of yoghurt:
a) Sterptococcus b) Streptococcus thermophilous c) Lactobacillus bulgaris
d) Both (2) & (3)
207. The term 'apiculture' refers to
a) tissue culture b) pisciculture c) bee-keeping d) animal-keeping.
208. The agriculture sector of India employs about
a) 50 percent of the population b) 70 percent of the population
c) 30 percent of the population d) 60 percent of the population
209. Turnip mosaic disease is caused by
a) bacteria b) viruses c) nematodes d) fungi
210. Match column I with column II and select the correct option from the codes given below.
- | Column I | Column II |
|---------------------|------------------------|
| A. Green revolution | (i) Milk production |
| B. Pisciculture | (ii) Crop plants |
| C. White revolution | (iii) Fish production |
| D. Blue revolution | (iv) Rearing of fishes |
- a) A-(ii), B-(iv), C-(iii), D-(i) b) A-(iv), B-(ii), C-(i), D-(iii) c) A-(iii), B-(ii), C-(iv), D-(i)
d) A-(ii), B-(iv), C-(i), D-(iii)
211. Which of the following is an example of mutation breeding?
a) Pusa Swarnim, resistant to white rust b) Mung bean, resistant to yellow mosaic virus
c) Pusa Sadabahar, resistant to chilli mosaic virus d) Pusa Gaurav, resistant to aphids
212. Which one of the microorganism is used for production of citric in industries?
a) Lactobacillus bulgaricus b) Penicillium citrinum c) Aspergillus niger
d) Rhizopus nigricans
213. Honey is _____.
a) acidic b) neutral c) alkaline d) basic after some days
214. An improved variety of transgenic basmati rice _____.
a) does not require chemical fertilisers and growth hormones
b) gives high yield and is rich in vitamin A
c) is completely resistant to all insect pests and diseases of paddy
d) gives high yield but has no characteristic aroma
215. All the following are objectives of dairy farm management, except
a) Improvement in quality of milk b) Selection of good breeds having high yielding potential
c) Selection of breeds which are vulnerable to diseases
d) Maintenance of quality and quantity of fodder
216. Sources of resistant genes in plant breeding may be
a) Cultivated varieties b) Germplasm collection of cultivated crops
c) Germplasm collection of wild relatives d) All of these

217. Given flow chart represents different steps of MOET. Study the flow chart carefully and select the correct answer for (1), (2) and (3).



- a)
1-FSH, 2-Super ovulation due to induced follicular maturation, 3- Transfer to surrogate mother
- b)
1-LH, 2-Super ovulation due to induced follicular maturation, 3- Transfer to surrogate mother
- c)
1-Progesterone, 2-Super ovulation due to induced follicular maturation, 3- Transfer to surrogate mother
- d)
HSH, 2-Transfer to surrogate mother, 3-Super ovulation due to induced follicular maturation
218. Which of the following statements is incorrect?
- a) Biofertilizers are used to maintain and improve soil fertility
- b) Chemical fertilizers pollute soil and water resources
- c) Chemical fertilizers are expensive
- d) Most pesticides used these days are specific in nature
219. Germplasm collection is the collection of
- a) germ cells b) semens c) plants/seeds with all the diverse alleles for all genes
- d) egg cells
220. Which bacteria is utilized in Gobar gas plant?
- a) Methanogens b) Nitrifying bacteria c) Ammonifying bacteria d) Denitrifying bacteria
221. Which one produce gas by decomposing the gobar (Dung) in gobar gas:-
- a) Fungus b) Virus c) Methanogenic bacteria d) Algae
222. Artificial insemination involves
- a) super ovulation b) semen collection c) egg collection d) embryo collection
223. The long term prospects for a truly human civilisation depend in a large measure on _____.
a) the ability of humanity to moderate its fecundity b) increasing the food production
c) colonisation of underpopulated areas d) control of human diseases

224. The material of biological origin, which is used to maintain and improve soil fertility is:-
a) Bio pesticide b) Bionutrient c) Chemical fertilizers d) Green manure
225. Stage of silkworm from which silk is obtained
a) Cocoon b) Adult c) Larva d) Egg
226. Micropropagation involves
a) vegetative multiplication of plants by using microorganisms
b) vegetative multiplication of plants by using small explants
c) vegetative multiplication of plants by using microspores
d) non-vegetative multiplication of plants by using microspores and megaspores
227. Which one of the following is the most suitable medium for culture of *Drosophila melanogaster*.
a) Agar agar b) Ripe banana c) Cow dung d) Moist bread
228. Inbreeding depression can be overcome by
a)
Mating of animals of same breed, but having no common ancestors on either side of their pedigree upto 4 - 6 Generations
b) mating males of one breed with superior females of another breed
c) Interspecific hybridisation d) All of these
229. Which of the following diseases is caused by virus?
a) Tobacco mosaic b) Late blight of potato c) Turnip mosaic d) Both (a) and (c)
230. Which of the following can drastically affect the egg and chicken consumption in a country?
a) Bird flu b) Inbreeding c) Out-crossing d) Cross-breeding
231. The reason why vegetatively reproducing crop plants are best suited for maintaining hybrid vigour is that _____.
a) they can be easily propagated b) they have a longer life span
c) they are more resistant to disease
d) once a desired hybrid is produced, there are no chances of losing it
232. The puffed-up appearance of dough is due to-
a) Growth of LAB b) Production of O_2 & ethanol c) Production of CO_2
d) Growth of yeast *Monascus*
233. Which of the following fermented beverage will not be produced by distillation of fermented broth.
a) Whisky b) Brandy c) Rum d) Wine
234. Artificial insemination means
a) Transfer of sperms of a healthy donor to a test tube containing ova
b) Transfer of sperms of husband to a test tube containing ova
c) Artificial introduction of sperms of a healthy donor into the vagina
d) Introduction of sperms of healthy donor directly into the ovary
235. The ability of plant cell to give rise to a complete plant is called
a) Tissue culturing b) Totipotency c) Pluripotency d) Hardening

236. Lysine and tryptophan are
a) proteins b) non-essential amino acids c) essential amino acids
d) aromatic amino acids
237. Which of the following are common freshwater fishes?
a) Mackerel and rohu b) Rohu, common carp and Catla c) Hilsa and sardine
d) None of these
238. ____ is the management of animals for milk and its products for human consumption
a) Poultry b) Dairying c) Apiculture d) Fisheries
239. Scented basmati rice is the contribution of
a) Dr. Borlaug b) Carlosn c) Dr.M.S Swaminathan d) Skoog and miller
240. **Assertion:** Light is essential in poultry farm management.
Reason: 14-16 hours of light including daylight is required for optimum production of eggs.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
241. Select the correct option to fill up the blanks in the following statements.
(i) Controlled breeding experiments are carried out using _____.
(ii) In MOET technology, the fertilised eggs at _____ cells stages, are recovered and transferred to surrogate mothers.
(iii) In MOET technology, the cow produces _____ eggs instead of one egg.
(iv) _____ is an industry devoted to the catching, processing or selling of fish.
a) (i) Artificial insemination, (ii) 8-32, (iii) 6-8, (iv) Fisheries
b) (i) Artificial insemination, (ii) 8-32, (iii) 6-8, (iv) Silviculture
c) (i) Artificial insemination, (ii) 6-8, (iii) 8-32, (iv) Pisciculture
d) (i) Artificial insemination, (ii)4-8, (iii) 8-32, (iv) Fisheries
242. For biogas production besides dung an extensive use of which weed is recommended in our country
a) Mangifera indica b) Hydrilla c) Eichhornia crassipes d) Solanum
243. Beewax is the secretion of abdominal glands of
a) drones b) worker bees c) queen bees d) worker and queen bees
244. In crop improvement programme, haploids are important because they _____.
a) require one half of nutrients b) are helpful in study of meiosis
c) grow better under adverse conditions d) form perfect homozygous
245. Which of the following points are important for successful bee-keeping?
(i) Knowledge of the nature and habits of bees.
(ii) Selection of suitable location for keeping the beehives.
(iii) Management of beehives during different seasons.
(iv) Cross hybridisation among the selected parents
a) (i), (iii) and (iv) b) (ii) and (iv) c) (i), (ii) and (iii) d) (i) and (iii)

246. The breeding carried out between animals of different breeds is called
a) out-crossing b) cross-breeding c) inbreeding d) both (a) and (b).
247. **Assertion:** Breeding, weeding, feeding and heeding are essential methods for livestock production.
Reason: Livestock management deals with processes and systems that increase yield and improve quality of products.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
248. Which one of the following crop varieties correctly matches with its resistance to a disease?
- a)
- | Variety | Resistance to diseases |
|------------|------------------------|
| Pusa Komal | Bacterial blight |
- b)
- | Variety | Resistance to diseases |
|----------------|------------------------|
| Pusa Sadabahar | White rust |
- c)
- | Variety | Resistance to diseases |
|--------------|------------------------|
| Pusa Swarnim | Tobacco Mosaic Virus |
- d)
- | Variety | Resistance to diseases |
|--------------|------------------------|
| Pusa Shubhra | Chilli Mosaic Virus |
249. A common biocontrol agent for the control of plant diseases caused by fungi is
a) Agrobacterium b) Glomus c) Trichoderma d) Baculovirus
250. A patient brought to a hospital with myocardial infarction is normally immediately given
a) Cyclosporin -A b) statins c) Penicillin d) Streptokinase
251. Use of certain chemicals and radiation to change the base sequences of genes of crop plants is termed
a) recombinant DNA technology b) transgenic mechanism c) mutation breeding
d) gene therapy.
252. Select the incorrect statement from the following.
a) Apiculture provides additional income generating source to the farmers.
b) Bee-keeping is labour intensive process.
c) Bee venom is used to cure certain diseases like gout and arthritis.
d) Honey is used as laxative, antiseptic and sedative.
253. In dairy farm management, we deal with processes and systems that increase yield and improve quality of milk. Which of the following statement is incorrect in this regard?
a)
Milk yield is primarily dependent on the quality of milk, therefore selection of high yielding breed is very important.
b)
The quality and quantity of fodder provided to cattle do not contribute much to the milk yield

c)

Cleanliness and hygiene both of the cattle and handlers are of paramount importance while milking, storage and transport of the milk and its products

d)

Regular inspections, visits by a veterinary doctor with proper record keeping help identify and rectify the problems of cattle as early as possible thus ensuring a proper milk yield

254. Which of the following can be used for cultivation of SCP?

a) Animal manure b) Straw c) Molasses d) All of these

255. Hormone responsible for growth of the root in micropropagation is

a) auxin b) gibberellin c) cytokinin d) abscisic acid.

256. Breeding for improved nutritional quality is undertaken with the objectives of improving

a) Vitamin content and quality only b) Minerals quality only
c) Protein, oil content and quality d) More than one options is correct

257. **Assertion:** Emasculation is removal of male parts.

Reason: Bagging is not required for emasculated flowers.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

258. Microbial insecticide is:

a) Bacillus polymixa b) Bacillus subtillo c) Bacillus subtillo d) Bacillus thuringensis

259. Formation of vinegar from alcohol is caused by

a) Bacillus subtitles b) Clostridium c) Acetobacter aceti d) Azotobacter

260. Match the terms given in column I with their descriptions given in column II and select the correct option from the codes given below.

Column I	Column II
A. Out-crossing	(i) Mating of closely related individuals within the same breed
B. Interspecific hybridisation	(ii) Mating of animals of same breed but having no common ancestors on either side of their pedigree for 4 - 6 generations.
C. Cross-breeding	(iii) Mating of animals of two different species
D. Inbreeding	(iv) Mating of animals belonging to different breeds

a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(iii), B-(ii), C-(iv), D-(i) c) A-(iv), B-(ii), C-(iii), D-(i)

d) A-(ii), B-(iv), C-(iii), D-(i)

261. Tropical cane grown in south india is

- a) Saccharum barberi with high sugar yield
b) S.Barberi with thinner stem and poor sugar content c) S.officinarum with thicker stem
d) S.officinarum with poor sugar content /yield
262. **Assertion:** Hisardale is cross breed of sheep.
Reason: Hisardale is developed by crossing Bikaneri ewe and Marino ram.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
263. Pebrine is a disease of _____.
a) honeybee b) fish c) silkworm d) lac insect
264. **Assertion:** A single outcross often helps to overcome inbreeding depression.
Reason: Out-crossing is best breeding method for increasing milk productivity.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
265. The infectious and contagious bacterial disease that affects cattle, buffaloes, horses, sheep and goats is
a) anthrax b) rinderpest c) tick fever d) necrosis
266. The most abundant sources of SCP on earth is
a) Chlorella b) Spirulina c) Scenedesmus d) Pulses
267. The pioneer country in the production of 'Fuel alcohol' is
a) Japan b) Brazil c) Saudi Arabia d) India
268. Which of the following is not a freshwater fish?
a) Salmon b) Mrigal c) Catla d) Rohu
269. The scientific process by which crop plants are enriched with certain desirable nutrients is called
a) crop protection b) breeding c) bio-fortification d) bio-remediation.
270. **Assertion:** In tissue culture, whole plant can be produced from plant cell.
Reason: The capacity to generate a whole plant from any cell/explant is called totipotency
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
271. What are the advantage of gobar gas over conventional utilization?
a) More efficient source of energy b) Used as good fertilizer
c) Reduces the chances of spreading of pathogens d) All the above

272. A wheat variety, Atlas 66, which has been used as a donor for improving cultivated wheat is rich in
a) iron b) carbohydrates c) proteins d) vitamins
273. Somaclones are
a) somatic hybrids b) genetically identical to the original plant
c) used to recover disease free plants d) sterile plants
274. Which of the following are the fishery by-products?
(i) Oil
(ii) Manure
(iii) Glue
(iv) Isinglass
(v) Shagreen
(vi) Leather
a) (i), (ii) and (vi) b) (iii), (iv) and (v) c) (i), (iii) and (vi) d) All of these
275. Animal husbandry deals with
a) Only caring of livestock b) Only breeding of livestock
c) Both caring and breeding of livestock d) Slaughtering of livestock
276. Heterosis can be defined as
a) When F_1 phenotype is superior to both parents
b) Only when F_1 phenotype resembles both parental phenotype c) Both (1) & (2)
d) Production of intersepecific hybrids only
277. Maximum percentage of alcohol present in the product of year fermentation
a) Brandy b) gin c) Rum d) wine
278. Which of the following is the pair of biofertilizers
a) Azolla and BGA b) Nostoc and legume c) Rhizobium and grasses
d) Salmonella % E.Coli
279. Shakti, Rattan and Protina (varieties of maize) are rich in
a) lysine b) glycine c) fats d) carbohydrates
280. In Lederberg's replica experiment what shall be used to obtain streptomycin-resistant strain?
a) minimal medium and streptomycin b) complete medium and streptomycin
c) only minimal medium d) only complete medium
281. Biogas is produced by anaerobic breakdown of biomass of agricultural waste by methanogenic
a) One step process b) Two step process c) Three step process d) Multistep process
282. Haploid plant cultures are got from _____.
a) leaves b) root tip c) pollen grain d) buds
283. Bacillus thuringiensis is used to control
a) Moth b) Flies c) Mosquito d) All the above
284. Breeding of crops with high levels of minerals, vitamins and protein is called:
a) Micropropagation b) Somatic hybridisation c) Biofortification d) Biomagnification

285. Which of the following crops have been brought to India from new world?
a) Cashewnut, Potato, rubber b) Mango, tea c) Tea, rubber, mango d) Coffee
286. Which of the following birds are included in poultry?
a) Chicken and ducks only b) Chicken, ducks, turkey c) Chicken only
d) Chicken, ducks, turkey, geese
287. A breed of cow is mated with closely related breed for five generations. It was found that production of milk has reduced subsequently and the animals are not keeping good health. Which of the following methods of animal breeding can overcome this problem?
a) Hybridisation b) Controlled breeding c) Out-crossing d) Cross breeding
288. Given below are four statements (i)-(iv). Which two of the following statements are correct?
(i) It is estimated that more than 70 percent of the
(ii) Stringent cleanliness and hygiene (both of the cattle and the handlers) are of paramount importance while milking, storage and transport of the milk and its products.
(iii) Out-breeding is the breeding between animals of the same breed only.
(iv) Crosses between different breeds is called inbreeding.
a) (i) and (ii) b) (i) and (iv) c) (iii) and (iv) d) (ii) and (iii)
289. Beer is obtained from
a) Molasses b) Graps c) Barley d) Rye
290. India and China have more than 70% of world livestock population. However, their contribution to world farm produce is only:
a) 10% b) 25% c) 40% d) 50%.
291. Somaclones are obtained by _____.
a) plant breeding b) irradiation c) genetic engineering d) tissue culture
292. The biggest constraint of plant breeding is
a) availability of desirable gene in the crop and its wild relatives b) infrastructure
c) trained manpower d) transfer of genes from unrelated sources.
293. Sonalika and Kalyan Sana are varieties of
a) wheat b) rice c) millet d) tobacco
294. Hairy leaves of many plants are associated with
a) resistance to insect pests b) resistance to viruses c) resistance to fungi
d) resistance to bacteria
295. It is estimated that more than _____ of the world livestock population is in India and China.
a) 25% b) 70% c) 40% d) 50%
296. During the formation of bread it becomes porous due to release of CO_2 by the action of:-
a) Yeast b) Bacteria c) Virus d) Protozoans
297. The use of honeybee is
a) to help in pollination b) production of beeswax c) production of honey d) all of these.
298. Fungicides and antibiotics are chemicals that

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- a) enhance yield and disease resistance b) kill pathogenic fungi and bacteria, respectively
c) kill all pathogenic microbes d) kill pathogenic bacteria and fungi respectively
299. Which of the following industry is devoted to the catching, processing or selling of fish, shellfish or other aquatic animals?
a) Aquaculture b) Inland Fishery c) Fishery d) Pisciculture
300. Himgiri developed by hybridisation and selection for disease resistance against rust pathogens is a variety of _____.
a) chilli b) maize c) sugarcane d) wheat
301. *Saccharomyces cerevisiae* is used in the formation:
a) Ethanol b) Methanol c) Acetic acid d) Antibiotics
302. Which one of the following microbes forms symbiotic association with plants and helps them in their nutrition?
a) Glomus b) Trichoderma c) Azotobacter d) Aspergillus
303. Yeast is used in the production of:-
a) Bread and beer b) Cheese and butter c) Citric acid and lactic acid
d) Lipase and pectinase
304. Taichung Native - 1 variety of rice was developed in
a) Taiwan b) Japan c) Mexico d) America
305. Animal Husbandry is:
a) Agricultural practice of breeding and raising the livestock
b) Deals with care and breeding like buffaloes, cows, pigs, horses, sheep, goat etc
c) Is a vital skill for farmers and is as much science as it is art d) All of these
306. Jaya and Ratna are the semi-dwarf varieties of
a) wheat b) rice c) cowpea d) mustard
307. Which of the following are edible marine fishes?
a) Catla, Rohu, clarias b) Hilsa, Mackerels, pomfrets c) Heteropneustes, wallago, calta
d) Labeo, calbasu, singhi
308. Which one of the following is being tried in India as a biofuel substitute for fossil fuels?
a) Jatropha b) Azadirachta c) Musa d) Aegilops
309. Read the following statements and select the correct option.
Statement 1: Ranikhet disease is a disease of poultry.
Statement 2: It is caused by a virus.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
310. Which biocontrol agent is very common in root ecosystem & is effective against several plant pathogens:

- a) Baculoviruses b) Trichoderma c) Nucleopolyhedrovirus
d) Ladybird beetle & Dragonflies
311. Breeding Crops with higher levels of vitamins and minerals of higher protein and healthier fats is called:
a) Biofortification b) Biomagnification c) Phytoremediation d) Domestication
312. Bio pesticide include:-
a) Only bionsecticide b) Only bioherbicide c) Bionsecticide & bioherbicide
d) Bioherbicide, bioinsecticide & bio fertilisers
313. Jaya and Ratna developed for green revolution in India are the varieties of _____.
a) maize b) rice c) wheat d) bajra
314. Atlas 66 variety of wheat possess/form
a) High protein content b) Scented grains c) Resistance for grassy stunt virus
d) Vitamin C
315. Micropropagation is
a) propagation of microbes in vitro b) propagation of plants in vitro
c) propagation of cells in vitro d) growing plants on smaller scale
316. The dwarf wheat varieties brought from Mexixo into india were
a) Sonalika and ratna b) Sharbati Sonora and Pusa Lerma
c) Sonora - 64 and Lerma Roja - 64 d) Jaya and sonalika
317. **Assertion:** Breeding and development of cultivars resistance to diseases enhances food production.
Reason: Cultivar resistance to diseases reduces the dependence on use of fungicides and bacteriocides.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
318. The technique of obtaining large number of plantlets by tissue culture method is called _____.
a) Plantlet culture b) Organ culture c) Micropropagation d) Macropropagation
319. Highets yielding grain crop of world is
a) Maize b) barley c) Wheat d) Rice
320. A group of animals which are related by descent and share many similarities are referred to as
a) breed b) race c) variety d) species
321. In honey, the main constituent is:
a) calcium b) sugar c) protein d) water
322. Among the following edible fishes, which one is a marine fish having rich source of omega-3-fatty acids?
a) Mystus b) Mangur c) Mrigala d) Mackerel

323. Which of the following is the "bird flu virus"?
- a) H_5N_1 b) Haemophilus influenzae c) HIV d) Rhino virus
324. Which of the following is incorrectly paired?
- a) Wheat - Himgiri b) Milch breed - Sahiwal c) Rice - Ratna d) Pusa Komal - Brassica
325. Which of the following measure is taken to realise the yield potential of cattle?
- a) Proper housing b) Adequate supply of water and fodder
c) Stringent cleanliness and hygiene d) All of these
326. Isinglass is used for:
- a) Production of insulin b) Breeding cattle, pig and poultry
c) Preparation of paints and varnishes d) clarification of vinegar, wines and beer
327. The chances of contracting bird flu from a properly cooked (above 100°C) chicken and egg are
- a) very high b) high c) moderate d) none
328. IPM (Integrated Pest Management) involves:
- a) tissue culture b) biological control c) bio-fertilizers d) confusion technique



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Time : 1 Mins

MICROBES IN HUMAN WELFARE 1

Marks : 800

- Microbes are present in
a) soil b) thermal vents c) polluted water d) all of these.
- In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Acetic acid production involves both aerobic and anaerobic processes.
Reason: Production of alcohol from glucose is an aerobic process and production of acetic acid from alcohol is an anaerobic process
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
- Which of these following methods is the most suitable for disposal of nuclear waste?
a) Bury the waste under Antarctic ice-cover.
b) Dump the waste within rocks under deep ocean.
c) Bury the waste within rocks deep below the Earth's surface.
d) Shoot the waste into space.
- Which of the following statements regarding antibiotics is not correct?
(i) Antibiotics are the attenuated microorganisms which in small concentration can kill or retard the growth of other harmful microorganisms
(ii) Penicillin was the first antibiotic discovered by Alexander Fleming (1928) while working on bacterium *Staphylococcus aureus*.
(iii) The full potential of penicillin as an effective antibiotic was established by Ernest Chain and Howard Florey.
(iv) Fleming, Chain and Florey were awarded the Nobel Prize in 1945.
a) (i) only b) (iii) only c) (ii) and (iv) d) (i), (iii) and (iv)
- Study the following statements and select the correct ones.
(i) Methanogens are archaebacteria which produce methane in marshy areas
(ii) Nostoc is a filamentous blue green alga which fixes atmospheric nitrogen
(iii) Many members of the genus *Glomus* form mycorrhiza
a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (i), (ii) and (iii)
- Which of the following is a non-symbiotic biofertiliser?
a) VAM b) Azotobacter c) Anabaena d) Rhizobium
- Wine and beer are produced directly by fermentation whereas brandy and whisky require both fermentation and distillation. This is because:

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- a) fermentation is inhibited at an alcohol level of 10-18% b) distillation prolongs storage
c) distillation improves quality d) distillation purifies the beverage
8. Which one of the following microorganisms forms symbiotic association with plants and helps them in their nutrition?
a) Glomus b) Azotobacter c) Klebsiella d) Azospirillum
9. Organic farming includes
a) use of fertilisers and pesticides of biological origin b) IPM (Integrated Pest Management)
c) locally developed pest resistant varieties d) all of these.
10. Baculoviruses (Nucleopolyhedrovirus) do not show
a) host specificity b) narrow spectrum applications c) effects on non-target pathogens
d) utility in IPM programme.
11. The common nitrogen fixer in paddy fields is _____.
a) Rhizobium b) Azospirillum c) Oscillatoria d) Frankia
12. A good producer of citric acid is _____.
a) Pseudomonas b) Clostridium c) Saccharomyces d) Aspergillus
13. Which one of the following is an example of carrying out biological control of pests/ diseases using microbes?
a) Trichodenna sp. against certain plant pathogens
b) Nucleopolyhedrovirus against white rust in Brassica
c) Bt - cotton to increase cotton yield d) Ladybird beetle against aphids in mustard
14. Which of the following is not used as abiopesticide?
a) Xanthomonas campestris b) Bacillus thuringiensis c) Trichoderma harzianum
d) Nucleopolyhedrovirus
15. Biochemical oxygen demand (BOD) in a river water
a) has no relationship with concentration of oxygen in the water
b) gives a measure of Salmonella in the water
c) increases when sewage gets mixed with river water
d) remains unchanged when algal bloom occurs.
16. Which of the following is non-symbiotic biofertiliser?
a) VAM b) Azotobacter c) Anabaena d) Rhizobium
17. Which one of the following combinations of organisms are responsible for the formation and flavour of yoghurt?
a) Lactobacillus bulgaricus and Streptococcus thermophilus
b) Rhizobium meliloti and Azotobacter c) Bacillus subtilis and Escherichia coli
d) Bacillus megathermus and Xanthomonas species
18. Conversion of milk to curd improves its nutritional value by increasing the amount of :
a) Vitamin B₁₂ b) Vitamin A c) Vitamin D d) Vitamin E
19. For retting of jute, the fermenting microbe used is _____.
a) Methophilic bacteria b) Butyric acid bacteria c) Helicobacter pylori
d) Streptococcus lactin

20. Match column I with column II and select the correct answer from the given codes

Column I	Column II
A. Mycorrhizae	(i) Azadirachtin
B. Bacillus thuringiensis	(ii) Phosphorus nutrition
C. Root nodules	(iii) Leghaemoglobin
D. Biopesticid	(iv) Bioinsecticide

- a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(ii), B-(iii), C-(iv), D-(i) c) A-(ii), B-(iv), C-(iii), D-(i)
d) A-(iii), B-(iv), C-(ii), D-(i)

21. Dragonflies are used to get rid of

- a) mosquitoes b) aphids c) butterfly caterpillars d) both (a) and (b).

22. Unicellular symbiotic organisms improve yield of legumes by

- a) fixing atmospheric nitrogen without colonising roots of host plant
b) fixing atmospheric nitrogen and colonising roots of host plant
c) inducing the host plant to absorb more phosphorus
d) stimulating the host plant to become tolerant to drought

23. Wine yeast is

- a) Saccharomyces ellipsoidens b) S.sake c) S.pireformis d) S.Cerevisiae

24. Select the correct group of biocontrol agents.

- a) Trichoderma, Baculovirus, Bacillus thuringiensis b) Oscillatoria, Rhizobium, Trichoderma
c) Nostoc, Azospirillum, Nucleopolyhedrovirus
d) Bacillus thuringiensis, Tobacco mosaic virus, Aphids

25. Which of the following statements is/are correct?

a)

The important examples of cyanobacteria as biofertilisers are Anabaena, Nostoc and Oscillatoria.

- b) All of these c) In paddy fields, cyanobacteria serve as an important biofertiliser.

d)

Vermicompost consists of organic matter prepared by the action of earthworms on human or animal waste.

26. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: An organ transplant patient if not provided with cyclosporin A may reject the transplanted organ.

Reason: Cyclosporin A inhibits activation of T-cells and interferes with destruction of non-self cells.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false. d) If both assertion and reason are false.

27. Statins used for lowering blood cholesterol level are extracted from

a) algae b) bacteria c) viruses d) yeast

28. The inoculum is added to the fresh milk in order to convert milk into curd, the term 'inoculum' here refers to

a) a starter rich in vitamin B₁₂ b) a starter rich in proteins
c) a starter containing millions of LAB d) an aerobic digester.

29. Study the given differences between primary sludge and activated sludge and select the incorrect ones.

	Primary sludge	Activated sludge
(i)	It is sludge formed during primary sewage treatment.	It is sludge formed during secondary sewage treatment
(ii)	It possesses flocs of decomposer microbes	It does not possess flocs of decomposer microbes.
(iii)	It does not require aeration.	Formation of activated sludge requires aeration,
(iv)	A lot of decomposition occurs during formation of primary sludge.	Very little decomposition occurs during formation of activated sludge.

a) (i) and (ii) b) (ii) and (iv) c) (i), (iii) and (iv) d) (ii) and (iii)

30. The purpose of biological treatment of waste water is to

a) reduce BOD b) increase BOD c) reduce sedimentation d) increase sedimentation.

31. The masses of bacteria held together by slime and fungal filaments to form mesh-like structures are called as

a) primary sludge b) flocs c) activated sludge d) anaerobic sludge.

32. Probiotics are _____.

a) cancer inducing microbes b) new kind of food allergens
c) live microbial food supplement d) safe antibiotics

33. Select the correct option to fill up the blanks.

(i) _____ are used in detergent formulations and are helpful in removing oily stains from the laundry.

(ii) _____ are ripened by growing *Penicillium roqueforti* on them.

(iii) _____ are produced without distillation whereas, _____ are produced by distillation of the fermented broth.

(iv) _____ antibiotic was used to treat American soldiers wounded in world war II.

(v) _____ is also called as kusht rog.

a)

(i) Lipases, (ii) Camembert cheese, (iii) Whisky and rum, wine and beer, (iv) Penicillin, (v) Leprosy

b)

(i) Lipases, (ii) Roquefort cheese, (iii) Wine and beer, whisky and rum, (iv) Penicillin, (v) Leprosy

- c)
(i) Streptokinases, (ii) Roquefort cheese, (iii) Wine and beer, whisky and rum, (iv) Streptomycin, (v) Whooping cough
- d)
(i) Amylases, (ii) Swiss cheese, (iii) Whisky and rum, wine and beer, (iv) Penicillin, (v) Diphtheria
34. Methanogenic bacteria are not found in
a) rumen of cattle b) gobar gas plant c) bottom of water-logged paddy fields
d) activated sludge.
35. Fermented beverage with maximum alcohol content is
a) Beer b) Brandy c) Whisky d) Gin
36. Microbe used for biocontrol of pest butterfly caterpillars is
a) *Saccharomyces cerevisiae* b) *Bacillus thuringiensis* c) *Streptococcus* sp.
d) *Trichoderma* sp.
37. The symbiotic association between fungi and roots of higher plants is referred to as
a) lichen b) mycorrhiza c) biofertiliser d) biocontrol agent
38. Big holes in Swiss cheese are made by a
a) a machine b) a bacterium that produces methane gas
c) a bacterium producing a large amount of carbon dioxide
d) a fungus that releases a lot of gases during its metabolic activities
39. The chemical substances produced by some microbes which can kill or retard the growth of other microbes are called
a) antiseptics b) antacids c) antibiotics d) all of these.
40. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: Secondary treatment of sewage is also called biological treatment while primary treatment is called physical treatment.
Reason: Primary sewage treatment depends only upon sedimentation properties of materials present in sewage and filtration.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
41. Which of the following is mainly produced by the activity of anaerobic bacteria on sewage?
a) Mustard gas b) Marsh gas c) Laughing gas d) Propane
42. _____ produced by bacterium *Streptococcus* and modified by genetic engineering is used as a clot buster for removing clots from the blood vessels of patients who have undergone myocardial infarction leading to heart attack.
a) Lipase b) Streptokinase c) Cyclosporin A d) Antibiotic streptomycin
43. The nutritive medium for growing bacteria and many fungi in laboratory is called

- a) growth media b) suspension media c) culture media d) colonial media.
44. Azolla pinnata has been found to be an important biofertiliser for paddy crops. This quality is due to the presence of
a) N_2 fixing bacteria b) N_2 fixing cyanobacteria c) mycorrhizae d) all of these
45. Methanogens do not produce
a) oxygen b) methane c) hydrogen sulphide d) carbon dioxide.
46. An organism used as a biofertiliser for raising soyabean crops is _____.
a) Azotobacter b) Azospirillum c) Rhizobium d) Nostoc
47. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Biofertilisers are preferred to chemical fertilisers.
Reason: Chemical fertilisers are generally more expensive and hazardous to environment.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
48. Which of the following food items is produced by the fermenting activity of microbes?
A. Idli
B. Dosa
C. Toddy
D. Cheese
a) A and C b) C and D c) A, B and C d) A, B, C and D
49. A free living nitrogen fixing cyanobacterium which also forms symbiotic association with the water fern Azolla is:
a) Tolypothrix b) Chlorella c) Nostoc d) Anabaena
50. Match the following list of bioactive substances and their roles.
- | Bioactive Substance | Role |
|---------------------|---|
| (i) Statin | (A) Removal of oil stains |
| (ii) Cyclosporin A | (B) Removal of clots from blood vessels |
| (iii) Streptokinase | (C) Lowering of blood cholesterol |
| (iv) Lipase | (D) Immuno-suppressive agent |
- a) i-(B), ii-(C), iii-(A), iv-(D) b) i-(D), ii-(B), iii-(A), iv-(C) c) i-(D), ii-(A), iii-(B), iv-(C)
d) i-(C), ii-(D), iii-(B), iv-(A)
51. Yeast is used in the production of _____.
a) Citric acid and lactic acid b) Lipase and Pectinase c) Bread and beer
d) Cheese and butter
52. Biogas is produced by
a) aerobic breakdown of biomass b) anaerobic breakdown of biomass
c) with the help of methanogenic bacteria d) both (b) and (c).
53. Modern detergents contain enzyme preparations of _____.
a) Acidophiles b) Alkaliphiles c) Thermoacidophiles d) Thermophiles

54. Identify the blank spaces A, B, C and D in the following table and select the correct answer.

Type of microbe	Scientific name	Commercial product
Bacterium	A	Streptokinase
B	Aspergillus niger	Citric acid
Fungus	Trichoderma polysporum	C
Bacterium	D	Butyric acid

A - Streptococcus

A - Clostridium butylicum

A - Streptococcus

B - Fungus

B - Streptococcus

B - Yeast

C - Cyclosporin A

C - Fungus

C - Cyclosporin A

a) D - Clostridium butylicum

b) D - Cyclosporin A

c) D - Lactobacillus

A - Streptococcus

B - Cyclosporin A

C - Statins

d) D - Clostridium butylicum

55. Wastewater treatment generates a large quantity of sludge, which can be treated by

a) anaerobic digesters b) floc c) chemicals d) oxidation pond

56. Which of the following statements is incorrect?

a)

Word antibiotic is a misnomer. Anti is a Greek word that means 'against', and bios means 'life', together they mean 'against life' (in the context of disease causing organisms); whereas with reference to human beings, they are 'pro life' and not against.

b)

Flocs are masses of bacteria with interwoven fungal filaments which form mesh-like structures.

c)

Components of biogas are methane (50 - 70%), carbon dioxide (30 - 40%) and traces of hydrogen, nitrogen and H_2S .

d) None of these

57. Read the following statements and select the correct option.

Statement 1 : BOD represents the amount of dissolved oxygen that would be consumed if all the organic matter in one litre of water were oxidised by microorganisms.

Statement 2 : High value of BOD indicates that water is highly polluted by organic matter.

a) Both statements 1 and 2 are correct.

b) Statement 1 is correct but statement 2 is incorrect

c) Statement 1 is incorrect but statement 2 is correct.

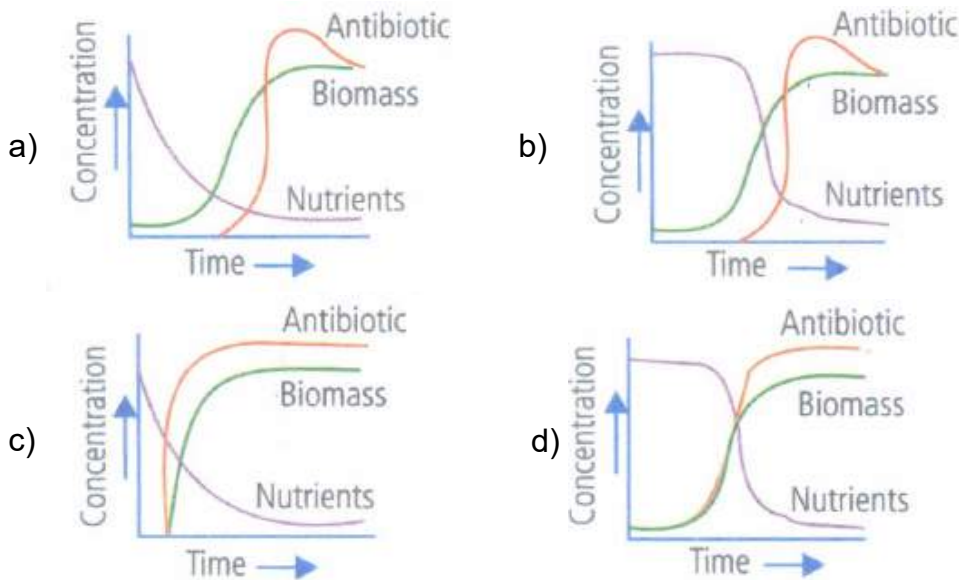
d) Both statements 1 and 2 are incorrect

58. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

Assertion: Toddy becomes unpalatable after 24 hours.

Reason: The fermentation of toddy is continued by naturally occurring yeasts.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
59. What would happen if oxygen availability to activated sludge flocs is reduced?
a) It will slow down the rate of degradation of organic matter.
b)
The center of flocs will become anoxic, which would cause death of bacteria and eventually breakage of flocs
c) Flocs would increase in size as anaerobic bacteria would grow around flocs.
d) Protozoa would grow in large numbers
60. What is agent orange?
a) A biodegradable insecticide b) A weedicide containing dioxin
c) Colour used in fluorescent lamp d) A hazardous chemical used in luminous paints
61. Which of the following is responsible for yoghurt formation?
a. Streptococcus thermophilus
b. Lactobacillus acidophilus
c. Lactobacillus bulgaricus
d. Streptococcus cremoris
a) a, b, & c b) a, d & c c) a & c d) a & d
62. Bacillus thuringiensis is used to control
a) bacterial pathogens b) fungal pathogens c) nematodes d) insect pests.
63. What gases are produced in anaerobic sludge digesters?
a) Methane and CO₂ only b) Methane, Hydrogen Sulphide and CO₂
c) Methane, Hydrogen Sulphide and O₂ d) Hydrogen Sulphide and CO₂
64. Match the following list of microbes and their importance:
- | | | |
|--------------------------------|-------|---|
| a. Sacharomyces cerevisiae | (i) | Production of immunosuppressive agents |
| b. Monascus Purpureus | (ii) | Ripening of swiss cheese |
| c. Trichoderma polysporum | (iii) | commercial production of ethanol |
| d. Propionibacterium sharmanii | (iv) | Production of blood cholesterol lowering agents |
- a) a(iii), b(i), c(iv), d(ii) b) a(iii), b(iv), c(i), d(ii) c) a(iv), b(iii), c(ii), d(i)
d) a(iv), b(ii), c(i), d(iii)
65. Which of the following curves correctly represents the process of antibiotic production by Streptomyces sp.?



66. Which of the following statements regarding baculoviruses as biocontrol agents is/are correct?

- The majority of baculovirus used as biocontrol agents are included in the genus - Nucleopolyhedrovirus
- Infection with baculoviruses occurs when susceptible hosts (e.g., some specific insects) eat virus particle present on foliage and dies.
- These are important in organic farming because of their specific action on harmful insects without causing any damage to beneficial insects as well as to the environment.
- All of these

67. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Statins	(i) Biogas
B. Dung	(ii) <i>Saccharomyces cerevisiae</i>
C. Ethanol production	(iii) <i>Monascus purpureus</i>
D. Cydospurin A	(iv) <i>Trichoderma polysporum</i>

- A-(iii), B-(i), C-(iv), D-(ii)
- A-(i), B-(iii), C-(iv), D-(ii)
- A-(iii), B-(ii), C-(iv), D-(i)
- A-(iii), B-(i), C-(ii), D-(iv)

68. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Most orchid seedlings cannot develop well in the absence of fungal mycelium.

Reason: Fungal mycelium increases efficiency of absorption only.

- If both assertion and reason are true and reason is the correct explanation of assertion
- If both assertion and reason are true but reason is not the correct explanation of assertion
- If assertion is true but reason is false.
- If both assertion and reason are false.

69. Which of the following microbes is a proteinacious infectious agent?

- Fungi
- Prions
- Bacteria
- Protozoa

70. Which of the following can be used as a biocontrol agent in the treatment of plant disease?

- a) Chlorella b) Anabaena c) Lactobacillus d) Trichoderma
71. Which of the following steps is taken by the Ministry of Environment and Forests to protect rivers from water pollution?
a) Ganga Action Plan b) Narmada Action Plan c) Yamuna Action Plan
d) Both (a) and (c)
72. *Monascus purpureus* is a yeast used commercially in the production of:
a) Citric acid b) Blood cholesterol lowering statins c) Ethanol
d) Streptokinase for removing clots from the blood vessel
73. Which of the following statements is/are incorrect?
(i) Cyanobacteria are autotrophic microbes widely distributed in aquatic and terrestrial habitats
(ii) *Anabaena*, *Nostoc* and *Oscillatoria* are photosynthetic N_2 - fixing cyanobacteria
(iii) *Tolypothrix* (BGA) can increase rice production by about 20%.
(iv) BGA add organic matter to the soil and increase its fertility.
(v) In our country, biofertilisers are not available commercially in the markets for farmers.
a) (v) Only b) (iv) Only c) (iii) Only d) None of these
74. *Trichoderma harzianum* has proved to be a useful microorganism for
a) gene transfer in higher plants b) biological control of soil-borne plant pathogens
c) bioremediation of contaminated soils d) reclamation of wastelands.
75. The primary treatment of wastewater involves the removal of
a) dissolved impurities b) stable particles c) toxic substances d) harmful bacteria
76. When domestic sewage mixes with river water
a) small animals like rats will die after drinking river water
b) the increased microbial activity releases micronutrients such as iron
c) the increased microbial activity uses up dissolved oxygen
d) the river water is still suitable for drinking as impurities are only about 0.1 %.
77. *Bacillus thuringiensis* (Bt) strains have been used for designing novel
a) biofertilisers b) bio-metallurgical techniques c) bio-mineralisation process
d) bio-insecticidal plants.
78. Read the following statements and select the correct option.
Statement 1: Besides curdling of milk, LAB also improve its nutritional quality by increasing vitamin B_{12} .
Statement 2: LAB, when present in human stomach, check disease causing microbes.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is correct but statement 2 is incorrect
d) Both statements 1 and 2 are incorrect
79. In the sewage treatment, bacterial flocs are allowed to sediment in a settling tank. This sediment is called as
a) inactivated sludge b) activated sludge c) primary sludge d) secondary sludge

80. Suppression of reproduction of one type of organism by utilising some features of its biology or physiology to destroy it or by use of another organism is known as _____.
a) comperition b) predation c) biological control d) physiological control
81. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Energy value of biogas is lower than that of organic matter.
Reason: Biogas minimises the chances of spread of fecal pathogens
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
82. Which of the following in sewage treatment removes suspended solid?
a) Secondary treatment b) Primary treatment c) Sludge treatment d) Tertiary treatment
83. Biofertilisers are
a) some bacteria and cyanobacteria b) fertilisers formed by ploughing in barseem
c) fertilisers obtained by decay of dead organisms
d) fertilisers prepared by mixing cattle dung with crop residues
84. Which one of the following help in absorption of phosphorus from soil by plant?
a) Glomus b) Rhizobium c) Frankia d) Anabaena
85. Biogases produced during sewage treatment are:
a) H_2S , CH_4 , SO_2 b) H_2S , N_2 , CH_4 c) CH_4 , H_2S , CO_2 d) CH_4 , O_2 , H_2S
86. Biofertilisers include:
a) Blue - green algae, rhizobia, other nitrogen-fixing bacteria and mycorrhiza fungi
b) Green algae, rhizobia and other nitrogen-fixing bacteria
c) Rhizobia, other nitrogen-fixing bacteria and brown algae
d) Blue green algae, rhizobia mycorrhizae funi and ref algae
87. In batch fermentation
a) substrates are added to the system all at once and runs until product is harvested
b)
nutrients are continuously fed into the reactor and the product is siphoned off during the run
c) new batches of microorganisms are screened for increase yield
d) small-scale production is used to synthesise product
88. Clot buster enzyme with firbrinolytic effect is
a) HMG CoA reductase b) Glucoamylase c) Stretokinase d) Protease
89. Streptomycin is obtained from
a) Streptomyces griseus b) S. cerevisiae c) S. venezuelae d) S. rimosus
90. Nitrogen fixing microbe associated with Azolla in rice field is.
a) Frankia b) Tolypothrix c) Spirulina d) Anabaena
91. Which one of the foliowing is not a biofertiliser?

- a) Agrobacterium b) Rhizobium c) Nostoc d) Mycorrhiza
92. Which of the following options includes biofertilisers?
- a) Cowdung manure and farmyard waste
- b) A quick, growing crop and ploughed back into the field c) Nostoc, Oscillatoria
- d) All of these
93. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
- Assertion:** Streptococcus thermophilus increases nutritional value of milk.
- Reason:** Curd and yoghurt have higher vitamin content than milk.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
- b) If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false. d) If both assertion and reason are false
94. Biogas contains
- a) 30% - 40% methane b) 50% - 70% CO₂ c) 50% - 70% methane d) 20% methane
95. Biopesticides are
- a) the chemicals which are used to destroy the pests
- b) the living organisms or their products which are used for the pest control
- c) the organisms which destroy the crops d) none of these.
96. Biological control component is central to advanced agricultural production. Which of the following is used as a third generation pesticide?
- a) Pathogens b) pheromones c) Insect repellents d) Insect hormone analogues
97. The reason that the chemical/synthetic fertilisers should be replaced by biofertilisers is that the former
- a) are source of environmental pollution b) are expensive
- c) exhaust the valuable energy resources for their manufacture d) all of these
98. Which of the following antibiotics was extensively used to treat American soldiers wounded in World War II?
- a) Neomycin b) Bacitracin c) Chloramphenicol d) Penicillin
99. Read the following statements and select the correct option.
- Statement 1:** Biocontrol refers to the use of biological methods for controlling plant diseases and pests.
- Statement 2:** Use of biocontrol measures will greatly reduce our dependence on toxic chemicals and pesticides.
- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect
- c) Statement 1 is incorrect but statement 2 is correct
- d) Both statements 1 and 2 are incorrect.
100. Cyanobacteria are
- a) heterotrophs b) chemotrophs c) autotrophs d) organotrophs

101. Which of the following antibiotics is not correctly matched with the source from which it is obtained?

a)

Antibiotic	Source
Penicillin	Penicillium chrysogenum

b)

Antibiotic	Source
Bacitracin	Bacillus licheniformis

c)

Antibiotic	Source
Griseofulvin	Penicillium griseofulvum

d)

Antibiotic	Source
Streptomycin	Bacillus griseus

102. An advantage of using yeasts rather than bacteria as recipient cells for the recombinant DNA of eukaryotes is that yeasts can

- a) produce restriction enzymes b) excise introns from the RNA transcript
c) remove methyl groups d) reproduce more rapidly.

103. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Rennet and fruit extract of *Withania somnifera* have antagonistic functions.

Reason: Rennet is obtained from calf's liver and is used for curdling of milk.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

104. Mycorrhiza does not help the host plant in

- a) enhancing its phosphorus uptake capacity b) increasing its tolerance to drought
c) enhancing its resistance to root pathogens d) increasing its resistance to insects.

105. Which one of the following pairs is wrongly matched?

- a) Alcohol - nitrogenase b) Fruit juice - Pectinase c) Textile - amylase
d) Detergents - lipase

106. Which of the following bacteria is present in the rumen of cattle?

- a) *Azotobacter* b) *Rhizobium* c) *Methanobacterium* d) *Azospirillum*

107. Which of the following is correctly matched for the product produced by them?

- a) *Methanobacterium*: Lactic acid b) *Penicillium notatum*: Acetic acid
c) *Saccharomyces cerevisiae*: Ethanol d) *Acetobacter aceti*: Antibiotics

108. Integrated Pest Management (IPM) discourages the excessive use of

- a) biological methods b) chemical pesticides c) mechanical methods d) all of these

109. Match the following columns and select the correct option.

Column-I	Column-II
(a) <i>Clostridium bretylicum</i>	(i) Cyclosporin-A
(b) <i>Trichodermapolysporum</i>	(ii) Butyric Acid
(c) <i>Monascus purpureus</i>	(iii) Citric Acid
(d) <i>Aspergillus niger</i>	(iv) Blood cholesterol lowering agent

- a) (i) (ii) (iv) (iii) b) (iv) (iii) (ii) (i) c) (iii) (iv) (ii) (i) d) (ii) (i) (iv) (iii)

110. Which of the following is not a nitrogen, fixing organism?
a) Nitrosomonas b) Rhizobium leghuminosarm c) Nostac d) Anabaena
111. BOD of wastewater is estimated by measuring the amount of
a) total organic matter b) biodegradable organic matter c) oxygen evolution
d) oxygen consumption.
112. A nitrogen-fixing microbe associated with Azolla in rice fields is _____.
a) Spirulina b) Anabaena c) Frankia d) Tolypothrix
113. The term antibiotic was first used by _____.
a) Flemming b) Pasteur c) Waksman d) Lister
114. Farmers have reported over 50% higher yields of rice by using which of the following biofertilisers?
a) Bacillus thuringiensis b) Legume - Rhizobium symbiosis c) Mycorrhizae
d) Azolla pinnata
115. Flocs are
a) Formed in primary setting tank b) Masses of fungal hyphae and green algae
c) Masses of bacteria associated with fungal filaments d) Formed in secondary settling tank
116. Enzyme which has the fibrinolytic effect is
a) protease b) amylase c) lipase d) streptokinase
117. Ethanol is commercially produced through a particular species of _____.
a) Saccharomyces b) Clostridium c) Trichoderma d) Aspergillus
118. Organic farming does not include
a) green manures b) chemical fertilisers c) farmyard manures d) compost
119. A drug used for patient A is obtained from the organism B. Identify A and B in the above statement and select the correct answer
- a)
- | A | B |
|-----------|--------------------|
| Swine flu | Monascus purpureus |
- b)
- | A | B |
|------|---------------------------|
| AIDS | Pseudomonas denitrificans |
- c)
- | A | B |
|-------|-------------------------|
| Heart | Penicillium chrysogenum |
- d)
- | A | B |
|------------------|------------------------|
| Organ transplant | Trichoderma polysporum |
120. Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes?
a) Sludge digest b) Industrial oven c) Bioreactor d) BOD incubator
121. Which of the following is not used as a biopesticide?
a) Trichoderma harzianum b) Nucleopolyhedrovirus c) Xanthomonas campestris
d) Bacillus thuringiensis
122. Match column I with column II and select the correct answer from the given codes

Column I	Column II
A. Ganga action plan	(i) N ₂ fixing
B. Bt cotton	(ii) Ministry of environment and forests

Column I	Column II
C. Rhizobium	(iii) Insect resistant plant
D. Nostoc	(iv) N ₂ fixing bacterium

- a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(iii), B-(ii), C-(iv), D-(i) c) A-(ii), B-(iv), C-(iii), D-(i)
 d) A-(i), B-(iii), C-(ii), D-(iv)

123. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

Assertion: Integrated pest management (IPM) programme at the same time deals with conservation of insects and destruction of insects.

Reason: IPM programmes are specially used in dealing with ecologically sensitive areas.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion
 c) If assertion is true but reason is false d) If both assertion and reason are false

124. Study the following statements and select the incorrect ones

- (i) Physical removal of large and small particles through filtration and sedimentation is called primary sewage treatment.
 (ii) Secondary sewage treatment is mainly a mechanical process.
 (iii) Activated sludge sediment in a sewage treatment plant is a rich source of aerobic bacteria.
 (iv) Biogas, commonly called as gobar gas, is pure methane.
 a) (i) and (ii) b) (ii) and (iv) c) (ii) and (iii) d) (iii) and (iv)

125. One of the major difficulties in the biological control of insect pests is the _____.

- a) practical difficulty of introducing the predator to specific areas
 b) method is less effective as compared with the use of insecticides
 c) predator does not always survive when transferred to a new environment
 d) the predator develops a preference to other diets and may itself become a pest

126. Which of the following diseases are treated by antibiotics?

- (i) Plague
 (ii) Diphtheria
 (iii) Leprosy
 (iv) Whooping cough
 a) (i), (ii) and (iii) b) (i), (iii) and (iv) c) (ii), (iii) and (iv) d) (i), (ii), (iii) and (iv)

127. Match the following organisms with the products they produce

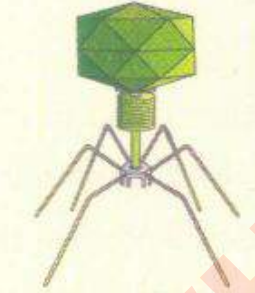


(a) Lactobacillus	(i) Cheese
(b) Saccharomyces cerevisiae	(ii) Curd
(c) Aspergillus niger	(iii) citric acid
(d) Acetobacter acetic	(iv) Bread
	(v) Acetic Acid

- a) (ii) (iv) (iii) (v) b) (iii) (iv) (v) (i) c) (ii) (i) (iii) (v) d) (ii) (iv) (v) (iii)

128. The free-living fungus Trichoderma can be used for:

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- a) killing insects b) biological control of plant diseases c) controlling butterfly caterpillars
d) producing antibiotics.
129. Which of the following is put into Anaerobic sludge digester for further sewage treatment?
a) Effluents of primary treatment b) Activated sludge c) Primary sludge
d) Floating debris
130. Which one of the following population interactions is widely used in medical science for the production of antibiotics?
a) Parasitism b) Mutualism c) commensalism d) Amensalism
131. Which of the following statements is not correct regarding mycorrhiza?
a) It helps in absorption of phosphorus from the soil
b) It is a symbiotic association of fungi with the roots of higher plants
c) It helps the plant in developing resistance to root- borne pathogens d) None of these
132. Which of the following is widely used as a successful biofertiliser in Indian rice fields?
a) Rhizobium b) Acacia arabica c) Acalypha indica d) Azolla pinnata
133. Match column I with column II and select the correct answer from the given codes.

Column I	Column II
A. 	(i) Adenovirus
B. 	(ii) Tobacco Mosaic Virus
C. 	(iii) Bacteriophage

- a) A-(i), B-(ii), C-(iii) b) A-(ii), B-(i), C-(iii) c) A-(iii), B-(ii), C-(i) d) A-(iii), B-(i), C-(ii)
134. Which of the following statements is incorrect?
a)
Word antibiotic is a misnomer. Anti is a Greek word that means 'against', and bios means 'life', together they mean 'against life' (in the context of disease causing organisms); whereas with reference to human beings, they are 'pro life' and not against.
b)
Flocs are masses of bacteria with interwoven fungal filaments which form mesh-like structures.

c)

Components of biogas are methane (50 - 70%), carbon dioxide (30 - 40%) and traces of hydrogen, nitrogen and H_2S .

d) None of these

135. Match the items in column 'A' and column 'B' and choose correct answer

Column A	Column B
(i) Lady bird	(A) Methanobacterium
(ii) Mycorrhiza	(B) Trichoderma
(iii) Biological control	(C) Aphids
(iv) Biogas	(D) Glomus

The correct answer is

- a) (i)-B, (ii)-D, (iii)-C, (iv)-A b) (i)-C, (ii)-D, (iii)-B, (iv)-A c) (i)-D, (ii)-A, (iii)-B, (iv)-C
d) (i)-C, (ii)-B, (iii)-A, (iv)-D.

136. Which of the following is included in biopesticide?

- a) Viruses and bacteria only b) Viruses, archaeobacteria and fungi only
c) Viruses, Bacteria, fungi insects d) Viruses, bacteria, fungi and nematodes

137. ___ is the first step of sewage treatment.

- a) Precipitation b) Chlorination c) Sedimentation d) Aeration

138. Which of the following is pair of bio-fertilisers?

- a) Azolla and BGA b) Nostoc and legumes c) Rhizobium and grasses
d) Salmonella and E. coli

139. An example of endomycorrhiza is :

- a) Glomus b) Agaricus c) Nostoc d) Rhizobium

140. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Nucleic acid complexes alone cannot cause diseases.

Reason: Only nucleoproteins can function as infectious agents.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.

141. Which one of the following is not a nitrogen-fixing organism?

- a) Anabaena b) Nostoc c) Azotobacter d) Pseudomonas

142. The aquatic fern, which is an excellent biofertiliser is _____.

- a) Azolla b) Pteridium c) Salvinia d) Marselia

143. A sewage treatment process in which a part of decomposer bacteria present in the wastes is recycled into the starting of the process is called as

- a) primary treatment b) activated sludge treatment c) tertiary treatment
d) none of these.

144. Dough kept overnight in warm weather becomes soft and spongy because of _____.

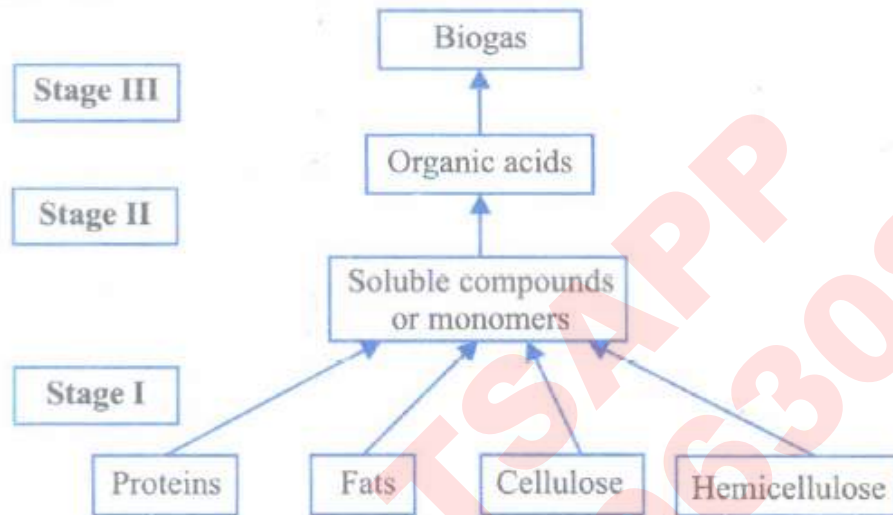
- a) absorption of carbon dioxide from atmosphere b) fermentation c) cohesion
d) osmosis
145. Which one of the following alcoholic drinks is produced without distillation?
a) Wine b) Whisky c) Rum d) Brandy
146. A microbial biocontrol agent that can be used to control butterfly caterpillars is
a) *Trichoderma polysporum* b) *Bacillus thuringiensis* c) *Streptococcus* d) mycorrhiza
147. The vitamin whose content increases following the conversion of milk into curd by lactic acid bacteria is
a) vitamin C b) vitamin O c) vitamin B₁₂ d) vitamin E
148. Human insulin is being commercially produced from a transgenic species of _____.
a) *Escherichia* b) *Mycobacterium* c) *Rhizobium* d) *Saccharomyces*
149. Nitrogen fixation in root nodules of *Alnus* is brought about by
a) *Frankia* b) *Azorhizobium* c) *Bradyrhizobium* d) *Clostridium*
150. Match column I with column II and select the correct answer from the given codes.
- | Column I | Column II |
|---------------------------|---|
| A. Methanogens | (i) BOD |
| B. Fermentors | (ii) Methane rich fuel gas |
| C. Organic waste in water | (iii) Production of methane |
| D. Biogas | (iv) Large vessels for growing microbes |
- a) A - (ii), B - (i), C - (iv), D - (iii) b) A - (iii), B - (iv), C - (i), D - (ii)
c) A - (ii), B - (iv), C - (iii), D - (i) d) A - (iv), B - (iii), C - (ii), D - (i)
151. Biofertilisers are organisms that enrich the nutrient quality of the soil. Which of the following can be used as biofertilisers?
a) Nitrogen fixing cyanobacteria b) Nitrogen fixing bacteria c) Mycorrhizae
d) All of these
152. The residue left after methane production from cattle dung is
a) burnt b) buried in land fills c) used as manure d) used in civil construction
153. Which one thing is not true about antibiotics?
a) The term 'antibiotic' was coined by Selman Waksman in 1942.
b) first antibiotic was discovered by Alexander Flemming.
c) Each antibiotic is effective only against one particular kind of germ.
d) Some persons can be allergic to a particular antibiotic.
154. Select the correct statement from the following?
a) Biogas is produced by the activity of aerobic bacteria on animal waste.
b) *Methanobacterium* is an aerobic bacterium found in rumen of cattle.
c) Biogas, commonly called gobar gas, is pure methane
d)
Activated sludge - sediment in settlement tanks of sewage treatment plant is a rich source of aerobic bacteria.
155. Living organisms used to enrich the nutrient quality of the soil are called as
a) biocontrol agents b) biofertilisers c) synthetic fertilisers d) natural fertilisers

156. Which one of the following is not used in organic farming?
a) Glomus b) Earthworm c) Oscillatoria d) Snail
157. Dosa and idli are fermented preparation of rice and Black Gram. The Fermentation is done with
a) Leuconostoc b) Streptococcus c) Saccharomyces
d) More than one option are correct
158. In which stage of sewage treatment desalination and chlorination of water is done?
a) Primary treatment b) Secondary treatment c) Tertiary treatment d) Both (1) & (2)
159. Which of the following statements is correct with regard to biocontrol agents?
a) Ladybird and dragonflies are used to get rid of aphids and mosquitoes respectively.
b) Bacillus thuringiensis bacteria are used to control butterfly caterpillars.
c) Trichoderma species are used to control several plant pathogens. d) All of these
160. Antibiotics are obtained from
a) bacteria b) fungi c) actinomycetes d) all of these.
161. Match column I with column II and select the correct answer from the given codes.

Column I	Column II
A. The stage in which of physical treatment of sewage is done	(i) Anaerobic digestion activated sludge and production of biogas
B. The stage in which biological treatment of sewage is done	(ii) Activated sludge
C. Name of the sediment in primary treatment	(iii) Aeration tanks
D. It is carried to aeration tanks from primary settling	(iv) Primary effluent
E. Name of the sediment in secondary treatment	(v) Primary sludge
F. Site of flocs growth	(vi) Secondary treatment
G. Function of sludge digester	(vii) Primary treatment

- a) A - (vii), B - (vi), C - (v), D - (iv), E - (ii), F - (iii), G - (i)
b) A - (i), B - (iii), C - (v), D - (vii), E - (ii), F - (iv), G - (vi)
c) A - (i), B - (ii), C - (iii), D - (iv), E - (v), F - (vi), G - (vii)
d) A - (vii), B - (vi), C - (i), D - (ii), E - (iii), F - (iv), G - (v)
162. In a microbiology laboratory, the technician uses heat to sterilise the nutrient solution that is used to grow a fungus. When the heating system broke down, he sterilised the solution by passing it (in a sterile environment) through a sterile filter with a pore size of 0.2 micrometers. When the fungus was grown on the filtered nutrient solution, it stopped growing and looked unhealthy within a few days, Which statements is the most likely explanation for the observed effects on the fungus?
a) The nutrient solution contained a virus
b) Heating makes the glucose in the nutrient solution more digestible

- c) Filtering removed one of the larger nutrient molecules
 d) The nutrient solution contained a bacterium that was pathogenic to the fungus.
163. Which is wrongly matched?
 a) Clostridium butylicum - Lactic acid b) Aspergillus niger - Citric acid c) Yeast- Statins
 d) Acetobacter acetic - Acetic acid
164. During the primary treatment of sewage, solid particles that settle down are called
 a) flocs b) primary sludge c) activated sludge d) anaerobic sludge.
165. Biogas generation is a three stage anaerobic digestion of animal and other organic wastes. Study the following flow chart and select the correct option for stages I, II and III



- a)
 In stage - I, anaerobic microorganisms bring about enzymatic breakdown of complex organic compounds into simple soluble compounds or monomers.
- b)
 In stage - II, monomers are converted into organic acids by fermentation causing microbes.
- c) In stage - III, organic acids are acted upon by methanogenic bacteria to produce biogas.
- d) All of these.
166. Identify the blank spaces A, B, C and D in the following table and select the correct answer.

Type of microbe	Scientific name	Commercial product
Bacterium	A	Lactic acid
Fungus	B	Cyclosporin A
C	Monascus purpureus	Statins
Fungus	Penicillium notatum	D

- A - Lactobacillus A - Acetobacter A - Lactobacillus
 B - Trichoderma polysporum B - Trichoderma polysporum B - Aspergillus niger
 C - Yeast C - Yeast C - Algae
 a) D - Penicillin b) D - Streptomycin c) D - Penicillin
 A - Lactobacillus
 B - Trichoderma polysporum
 C - Agaricus
 d) D - Penicillin

167. Identify the blank spaces A, B, C and D in the table given below and select the correct answer.

Type of microbe	Scientific name	Product	Medical application
Fungus	A	Cyclosporin A	B
C	Monascus purpureus	Statin	D

A - Trichoderma polysporum,

B - As an immunosuppressive agent,

C - Yeast (Fungus),

a) D - Lowering of blood cholesterol

A - Yeast (Fungus),

B - Lowering of blood cholesterol,

C - Trichoderma polysporum,

c) D - As an immunosuppressive agent

A - Trichoderma polysporum,

B - Lowering of blood cholesterol,

C - Yeast (Fungus),

b) D - As an immunosuppressive agent

A - Streptococcus,

B - As an immunosuppressive agent,

C - Bacterium,

d) D - Lowering of blood cholesterol

168. Microbes which cannot be cultured in cell free extracts are

a) Bacteria b) Fungi c) Viruses d) Algae

169. Match column I with column II and select the correct answer from the given codes.

Column I	Column II
A. Trichoderma	(i) Free living nitrogen fixing bacteria
B. Streptomyces	(ii) Biocontrol agent
C. Azospirillum	(iii) Lactic acid
D. Lactobacillus	(iv) Source of antibiotic

a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(ii), B-(iv), C-(i), D-(iii) c) A-(iii), B-(i), C-(ii), D-(iv)

d) A-(iv), B-(ii), C-(i), D-(iii)

170. Which one of the following is linked to the discovery of Bordeaux mixture as a popular fungicide?

a) Bacterial leaf blight of rice b) Downy mildew of grapes c) Loose smut of wheat

d) Black rust of wheat

171. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called _____.

a) biodegradation b) biopiracy c) bio-infringement d) bioexploitation

172. Activated sludge should have the ability to settle quickly so that it can:

a) be rapidly pumped back from sedimentation tank to aeration tank.

b)

absorb pathogenic bacteria present in wastewater while sinking to the bottom of the settling tank.

c) be discarded and anaerobically digested. d) absorb colloidal organic matter.

173. Methanogens, growing anaerobically on cellulosic material produce

a) methane b) methane and carbon dioxide c) methane and hydrogen

d) methane, carbon dioxide and hydrogen

174. Biofertilisers are the living organisms which:

a) bring about soil nutrient enrichment b) maximise the ecological benefits

c) minimise the environmental hazards d) all of these.

175. First mycoherbicide of the world was obtained from

- a) Trichoderma Polysporism b) Phytophthora palmivora c) Cactoblastis cactorum
d) NPV
176. Read the following statements and select the incorrect one.
a) Little decomposition occurs during the formation of primary sludge
b) Formation of primary sludge requires ample aeration
c) Activated sludge possess flocs of decomposer microbes
d) Formation of activated sludge requires aeration
177. When a natural predator (living organism) is applied on the other pathogen organisms to control them, this process is called as
a) biological control b) genetic engineering c) artificial control d) confusion technique
178. Lactobacillus acidophilus helps in formation of
a) Curd and yohurt b) Butter milk and curd c) Toghurt and Butter milk
d) Large holed swiss cheese
179. These bacteria grow anaerobically on cellulosic material, produce large amount of methane along with CO_2 and H_2 , and are collectively called as methanogens. Examples of such bacteria are
a) Methanobacterium b) Methanobrevibacter c) Methanococcus d) all of these
180. Read the following statements and select the incorrect one.
a) The dough used for making Dosa and Idli is fermented by bacteria
b) Microbes are used to ferment fish, soybean and bamboo shoots to make food
c)
The large holes in 'Swiss cheese' are due to production of large amount of CO_2 by a fungi called Propionibacterium sharmanii.
d) 'Toddy' is a traditional drink of Southern India made by fermentation by microbes.
181. In gobar gas, the maximum amount is that of :
a) Propane b) Methane c) Butane d) Carbon dioxide
182. Match the following list of bacteria and their commercially important products.
- | Bacterium | Product |
|-----------------------------|------------------|
| (i) Aspergillus niger | (A) Lactic acid |
| (ii) Acetobacter aceti | (B) Butyric acid |
| (iii) Clostridium butylicum | (C) Acetic acid |
| (iv) Lactobacillus | (D) Citric acid |
- a) i-(B), ii-(C), iii-(D), iv-(A) b) i-(B), ii-(D), iii-(C), iv-(A) c) i-(D), ii-(C), iii-(B), iv-(A)
d) i-(D), ii-(A), iii-(C), iv-(B)
183. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Dragonflies can be used to decrease occurrence of diseases like malaria, dengue, etc.
Reason: Baculoviruses are effective in controlling many insects and other arthropods.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

184. Which one of the following can be used as biofertiliser in cotton field?

- a) Azolla-Anabaena b) Streptococcus c) Azospirillum d) Azotobacter chroococcum

185. Study the following statements regarding lactic acid bacteria (LAB) which are used to convert milk into curd

- (i) They produce acids that coagulate and partially digest the milk proteins.
(ii) A small amount of curd added to the fresh milk as an inoculum contains millions of LAB, which at suitable temperature, multiply and convert milk into curd.
(iii) Conversion of milk into curd improves its nutritional quality by increasing vitamin B12.
(iv) LAB may result in acidity in the stomach of human beings.

Which of the given statements are correct?

- a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)

186. The technology of biogas production from cow dung was developed in India largely due to the efforts of

- a) Gas Authority of India b) Oil and Natural Gas Commission
c) Indian Agricultural Research Institute and Khadi & Village Industries Commission
d) Indian Oil Corporation.

187. Match different organisms in column I with their uses in column II and select the correct answer from the given codes

Column I	Column II
A. Lactobacillus acidophilus	(i) Formation of dough
B. Saccharomyces cerevisiae	(ii) Single cell proteins
C. Propionibacterium sharmanii	(iii) Conversion of milk into curd
D. Spirulina	(iv) Formation of Swiss cheese

- a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(iii), B-(i), C-(iv), D-(ii) c) A-(i), B-(iii), C-(iv), D-(ii)
d) A-(i), B-(iii), C-(ii), D-(iv)

188. Process of biogas production is

- a) aerobic process b) anaerobic process c) active process d) passive process.

189. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Beer and wine are called soft liquors while gin, rum etc., are hard liquors.

Reason: Beer and wine are made without distillation.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

190. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

Assertion: Nitrogenase enzyme gets inactivated in presence of oxygen yet N_2 fixation occurs

in aerobic cells of legume nodules.

Reason: Leghaemoglobin allows presence of oxygen just sufficient for cellular respiration only.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
- b) If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false. d) If both assertion and reason are false

191. Which of the following organisms is used in the production of beverages?

- a) *Penicillium notatum* b) *Saccharomyces cerevisiae* c) *Aspergillus niger*
- d) *Clostridium butylicum*

192. BOD is _____ in polluted water and _____ in potable water.

- a) more, less b) less, more c) less in both d) medium in both

193. A patient brought to a hospital with myocardial infraction is normally immediately given:

- a) Cyclosporin A b) Statins c) Penicillin d) Streptokinase

194. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

Assertion: Griseofulvin extracted from *P. griseofulvum* is used for ringworm treatment.

Reason: Trichophyton, Epidermophyton, etc., cannot grow well in presence of *Penicillium griseofulvum*.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false

195. Match column I with column II and select the correct answer from the given codes.

Column I	Column II
A. Azolla	(i) Symbiotic N_2 - fixer
B. Rotenone	(ii) Symbiotic association with N_2 - fixing cyanobacteria
C. <i>Crotalaria juncea</i>	(iii) Natural insecticide
D. Frankia	(iv) Green manure

- a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(ii), B-(iv), C-(iii), D-(i) c) A-(ii), B-(i), C-(iv), D-(iii)
- d) A-(i), B-(iii), C-(iv), D-(ii)

196. Which of the microorganism is used for production of citric acid in industries?

- a) *Lactobacillus bulgaris* b) *Penicillium citrinum* c) *Aspergillus niger*
- d) *Rhizopus nigricans*

197. Which of the following options contains the end products formed during anaerobic respiration in yeast?

- a) H_2O , CO_2 and energy b) H_2S , $C_6H_{12}O_6$ and energy c) CO_2 , C_2H_5OH and energy
- d) H_2O and CO_2

198. Which one of the following pairs is not correctly matched?

- a) *Streptomyces* - Antibiotic b) *Serratia* - Drug addiction c) *Spirulina* - Single cell protein
- d) *Rhizobium* - Biofertiliser

199. Fill up the blanks by selecting the correct option.

(i) Biogas is a mixture of gases which predominantly contains _____ and is used as _____

(ii) Methanogens are commonly found in the _____ during sewage treatment.

(iii) _____ species are free-living fungi and effective biocontrol agents of several plant pathogens

(i) methane, fuel,

(i) CO₂, fuel,

(i) methane, fuel,

(ii) anaerobic sludge,

(ii) primary sludge,

(ii) anaerobic sludge,

a) (iii) Trichoderma

b) (iii) Trichoderma

c) (iii) Baculoviruses

(i) methane, fuel,

(ii) aerobic sludge,

d) (iii) Trichoderma

200. Which of the following is wrongly matched in the given table?

a)

Microbe	Product	Application
Clostridium butylicum	Lipase	removal of oil stains

b)

Microbe	Product	Application
trichoderma polysporum	Cyclosporin A	immunosuppressive drug

c)

Microbe	Product	Application
Monascus Purpureus	Statins	Lowering of blood cholesterol

d)

Microbe	Product	Application
Streptococcus	Streptokinase	removal of clot from blood vessel



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

BIOTECHNOLOGY PRINCIPLES AND PROCESS 1

Marks : 1332

- Which of the following enzyme is known as molecular scissors
a) Ligase b) DNA polymerase c) Restriction enzyme d) Helicase
- Which of the following processes/techniques can be included under biotechnology?
(i) In vitro fertilisation
(ii) Synthesis of a gene
(iii) Correcting a defective gene
(iv) Developing a DNA vaccine
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)
- A transgenic food crop which may help in solving the problem of night blindness in developing countries is:
a) Stralink maize b) Bt soybean c) Golden rice d) Flavr savr tomatoes
- Rising of dough is due to
a) multiplication of yeast b) production of CO_2 c) emulsification
d) hydrolysis of wheat flour starch into sugars.
- Who among the following was awarded the Nobel Prize for the development of PCR technique?
a) Herbert Boyer b) Hargovind Khurana c) Kary Mullis d) Arthur Kornberg
- The Taq polymerase enzyme is obtained from:
a) Thiobacillus ferrooxidans b) Bacillus subtilis c) Pseudomonas putida
d) Thermus aquaticus
- In biotechnology what does vector means:
a) An extra chromosomal DNA that replicates autonomously b) Carrier of disease
c) Plasmid that can transfer gene to host cell d) Selectable marker
- The correct sequence of different steps of polymerase chain reaction is
a) annealing \rightarrow denaturation \rightarrow extension b) denaturation \rightarrow extension \rightarrow annealing
c) denaturation \rightarrow annealing \rightarrow extension d) extension \rightarrow denaturation \rightarrow annealing.
- Which of the following statements are correct with respect to a bioreactor?
(i) It can process large volumes of culture.
(ii) It provides optimum temperature and pH.
(iii) It is a completely automated tool.
(iv) It is a compact thermal cycler
a) (i) and (ii) b) (i), (ii) and (iii) c) (iii) and (iv) d) (ii) and (iii)

10. Match the terms given in column I with their definitions in column II and select the correct answer from codes given below.

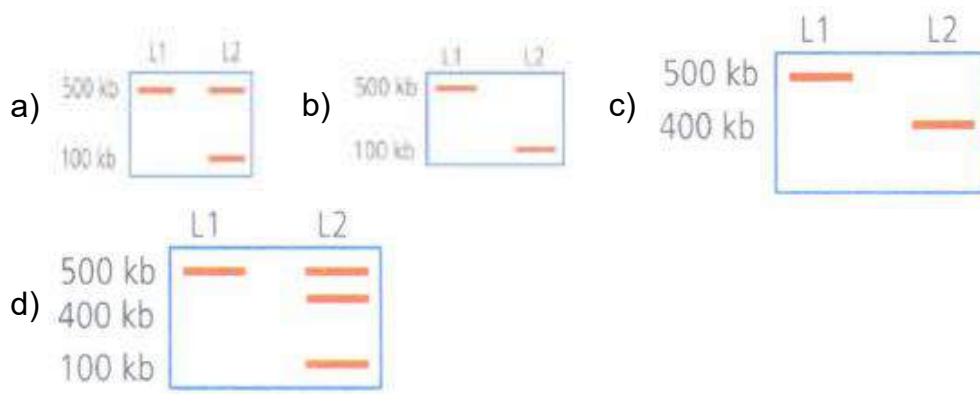
	Column I		Column II
A	Transformation	i	Sequences cut by restriction enzymes
B	Recognition site	ii	Process by which DNA fragments are separated based on their size
C	Gel electrophoresis	iii	Plasmid DNA that has incorporated human DNA
D	Recombinant DNA	iv	Process by which bacteria take up pieces of DNA from the environment

- a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(i), B-(ii), C-(iii), D-(iv)
d) A-(ii), B-(iii), C-(iv), D-(i)
11. _____ a crown gall bacterium, is called as 'natural genetic engineer' of plants.
a) Escherichia coli b) Streptomyces a/bus c) Agrobacterium tumefaciens
d) Azotobacter
12. The tumour inducing capacity of Agrobacterium tumefaciens is located in large-extrachromosomal plasmid and called -
a) Ti - Plasmid b) Ri - Plasmid c) Lambda phage d) Plasmid P^{BR} 322
13. Fill up the blanks and select the correct option.
(i) EcoRI cuts the DNA between bases _____ only when the sequence _____ is present in the DNA duplex.
(ii) Disruption of the cell membranes can be achieved by treating the bacterial cells, plant cells and fungal cells with enzymes respectively _____ and _____.
(iii) Since DNA has a _____ charge, it moves towards the _____ of the electrophoretic chamber.
a) (i) G and A, GAATTC (ii) endonuclease, cellulase, chitinase (iii) negative, anode
b) (i) G and A, GAATTC (ii) lysozyme, cellulase, chitinase (iii) positive, cathode
c) (i) G and A, GAATTC (ii) lysozyme, cellulase, chitinase (iii) negative, anode
d) (i) G and A, GAAATC (ii) lysozyme, cellulase, chitinase (iii) positive, cathode
14. Chemical knives of molecular biology are
a) Restriction endonucleases b) Exonuclease c) Reverse transcriptase d) Ligase
15. The figure shows the restriction enzyme cutting sites (R1-R3) in wild type (n) and mutant (n⁻) gene.



If a radioactively labelled probe (that hybridises at a sequence close to R1) is used for detecting the presence of DNA fragments after gel electrophoresis and Southern blotting, which of the following band patterns will you expect?

Note: L1: wild type DNA, L2: mutant DNA



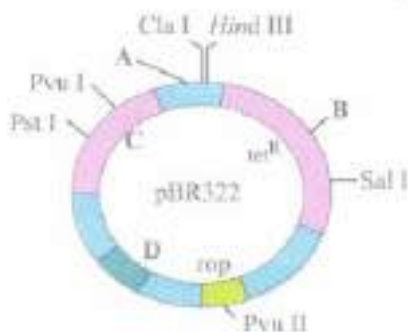
16. Which of the following is not used to transfer the recombinant DNA into the host?
 - a) Micro-injection method b) Gene gun method c) Bioreactors
 - d) Disarmed pathogen vectors
17. The restriction enzyme responsible for the cleavage of following sequence is

$$\begin{array}{c}
 5' - G - T - C \downarrow G - A - C - 3' \\
 3' - C - A - G \uparrow C - T - G - 5'
 \end{array}$$
 - a) EcoRI b) HindII c) BamHI d) EcoRII.
18. What map unit (Centimorgan) is adopted in the construction of genetic maps?
 - a) A unit of distance between two expressed genes representing 100% crossover.
 - b) A unit of distance between genes on chromosomes, representing 1% crossover.
 - c) A unit of distance between genes on chromosomes, representing 50% crossover.
 - d) A unit of distance between two expressed genes representing 10% crossover.
19. Transgenic plants are the ones:
 - a) Grown in artificial medium after hybridization in the field
 - b) Produced by a somatic embryo in artificial medium
 - c) Generated by introducing foreign DNA in to a cell and regenerating a plant from that cell
 - d) produced after protoplast fusion in artificial medium
20. Gene therapy first used in the treatment of:
 - a) Albinism b) Haemophilia c) SCID d) LIQID
21. Polymerase chain reaction technology (PCR- technique) is used for:
 - a) DNA identification b) DNA repair c) DNA amplification d) Cleave DNA
22. Genetic engineering is possible, because _____.
 - a) the phenomenon of transduction in bacteria is well understood
 - b) we can see DNA by electron microscope
 - c) We can cut DNA at specific sites by endonucleases like DNAs-I
 - d) restriction endonucleases purified from bacteria can be used in vitro
23. An advantage of using yeasts rather than bacteria as recipient cells for the recombinant DNA of eukaryotes is that yeasts can
 - a) produce restriction enzymes b) excise introns from the RNA transcript
 - c) remove methyl groups d) reproduce more rapidly.
24. DNA fragments generated by the restriction endonucleases in a chemical reaction can be separated by : _____.

- a) Polymerase chain reaction b) Electrophoresis c) Restriction mapping
d) Centrifugation
25. *Bacillus thuringiensis* forms protein crystals which contain insecticidal protein.
This protein:
a) does not kill the carries bacterium which is itself resistant to this toxin
b) binds with epithelial cells of midgut of the insect pest ultimately killing it
c) is coded by several genes including the gene cry
d) is activated by acid pH of the forgut of the insect pest
26. Which of the following is not a direct method of gene transfer in plants:
a) *Agrobacterium tumefaciens* b) Gene gun method c) Biolistic method
d) Electroporation
27. The source of the restriction enzyme HindIII is
a) *Escherichia coli* RY 13 b) *Escherichia coli* RY 13 c) *Bacillus amy/oliquefaciens* H
d) *Streptomyces albus*.
28. How many copies of DNA sample are produced in PCR technique after 6- cycle:
a) 4 b) 32 c) 6 d) 16
29. Study the following statements regarding recombinant DNA technology and select the incorrect ones.
(i) Taq polymerase extends the primers using the nucleotides provided in the reaction.
(ii) Antibiotic resistance genes are considered as desirable genes in recombinant DNA technology.
(iii) DNA fragments are separated according to their charge only, in agarose gel electrophoresis.
(iv) Transformation is a procedure through which piece of DNA is integrated in to the genome of a host bacterium.
(v) To produce higher yields of a desired protein, host cells can be multiplied in a continuous culture.
(vi) Downstream processing is one of the steps of polymerase chain reaction.
a) (ii), (iii) and (vi) b) (i), (iii) and (v) c) (ii), (iii) and (v) d) (i), (iv) and (v)
30. Which one of the following technique is used to produce the GM crops?
a) Micropropagation b) Somatic hybridization c) r-DNA technology d) Cross breeding
31. Which vector can clone only a small fragment of DNA?
a) Bacterial artificial chromosome b) Yeast artificial chromosome c) Plasmid d) Cosmid
32. **Assertion:** Genetic engineering can overcome the drawbacks of traditional hybridisation.
Reason: Genetic engineering can create desired DNA sequences to meet specific requirements.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

33. The specific palindromic sequence which is recognized by EcoRI is : _____.
a) 5'- CTTAG -3', 3'GAATTC - 5' b) 5'- GGATCC - 3' 3' _ CCTAGG- 5'
c) 5'- GAATTC - 3', 3' -CTTAAG - 5' d) 5' -GGAACC-3' 3' -CCTTGG_ 5'
34. Genetic engineering aims at :
a) Destroying wild gene b) Preserving defective gene
c) Curing human disease by introducing new gene d) All the above
35. An analysis of chromosomal DNA using the Southern hybridisation technique does not use _____.
a) Electrophoresis b) Blotting c) Autoradiography d) PCR
36. In gel electrophoresis, separated DNA fragments can be visualized with the help of:
a) acetocarmine in UV radiation b) ethidium bromide in infrared radiation
c) acetocarmine in bright blue light d) ethidium bromide in UV radiation
37. Which of the following restriction enzymes produces blunt ends?
a) Sal I b) Eeo RV c) Xho I d) Hind III
38. Which of the following combination of risk are associated with genetically modified food:
a) Toxicity b) Allergic reaction
c) Antibiotic resistance in microorganism present in alimentary canal d) All the above
39. If a person obtains transformants by inserting a recombinant DNA within the coding sequence of enzyme β -galactosidase, he will separate out recombinants from non-recombinants by which of the following observations?
a)
Non-recombinant colonies do not produce any colour whereas recombinants give blue coloured colonies.
b)
Recombinant colonies do not produce any colour whereas non-recombinants give blue coloured colonies.
c) Recombinants and non-recombinants both produce blue coloured colonies.
d) No colonies are formed due to insertional inactivation.
40. Read the given statements and select the correct option.
Statement 1 : Restriction endonuclease enzymes recognise a specific palindromic nucleotide sequence in the DNA.
Statement 2 : Restriction endonuclease enzymes are called as molecular scissors or biological scissors.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
41. Arrange the processes that occur in PCR in sequence:
a) Annealing - denaturation - extension b) Denaturation - annealing - extension
c) Extension - denaturation - annealing d) Denaturation - extension - annealing

42. Plasmids are important in biotechnology because they contain
- Recognition sites on recombinant DNA strands
 - Provirus incorporated into the host DNA
 - A vehicle for insertion of recombinant DNA into bacteria
 - Surface for respiratory process in bacteria
43. Which of the following is not required in the preparation of a recombinant DNA molecule?
- Restriction endonuclease
 - DNA ligase
 - DNA fragments
 - E.coli
44. Two microbes found to be very useful in genetic engineering are-
- Escherichia coli and Agrobacterium tumefaciens
 - Vibrio cholerae and a tailed bacteriophage
 - Diplococcus sp. and pseudomonas sp.
 - Crown gall bacterium and caenorhabditis elegans
45. Which one of the following is not a correct match?
- Tumour inducing - Ti plasmid
 - DNA probe - Identifies the desired DNA fragment
 - PCR - DNA staining
 - Agarose - Sea weeds
46. To isolate DNA from fungi we have to break the wall. This is done by
- Lysozyme
 - Cellulose
 - Invertase
 - Chitinase
47. If gene of interest was inserted at Sal I site in pBR322 the resulting plasmid will confer resistance to
- Ampicillin
 - Tetracycline
 - Kanamycin
 - Both (1) & (3)
48. Identify the plasmid among following
- Hind III
 - pBR-322
 - λ -phage
 - Both (2) & (3)
49. E. coli are used in production on:
- Rifampicin
 - LH
 - Ecdyson
 - Interferon
50. Which of the following cuts the DNA from specific places:
- Restriction endonuclease
 - Ligase
 - Exonuclease
 - Alkaline phosphate
51. Identify A, B, C and D in the given figure of E. coli cloning vector pBR322 and select the correct option.



- | a) | <table border="1"> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> <tr> <td>HindIII</td> <td>EcoRI</td> <td>amp^R</td> <td>ori</td> </tr> </table> | A | B | C | D | HindIII | EcoRI | amp ^R | ori |
|---------|---|------------------|-----|---|---|---------|-------|------------------|-----|
| A | B | C | D | | | | | | |
| HindIII | EcoRI | amp ^R | ori | | | | | | |
- | b) | <table border="1"> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> <tr> <td>HindIII</td> <td>BamHI</td> <td>kan^R</td> <td>amp^R</td> </tr> </table> | A | B | C | D | HindIII | BamHI | kan ^R | amp ^R |
|---------|---|------------------|------------------|---|---|---------|-------|------------------|------------------|
| A | B | C | D | | | | | | |
| HindIII | BamHI | kan ^R | amp ^R | | | | | | |
- | c) | <table border="1"> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> <tr> <td>BamHI</td> <td>PstI</td> <td>ori</td> <td>amp^R</td> </tr> </table> | A | B | C | D | BamHI | PstI | ori | amp ^R |
|-------|--|-----|------------------|---|---|-------|------|-----|------------------|
| A | B | C | D | | | | | | |
| BamHI | PstI | ori | amp ^R | | | | | | |
- | d) | <table border="1"> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> <tr> <td>EcoRI</td> <td>BamHI</td> <td>amp^R</td> <td>ori</td> </tr> </table> | A | B | C | D | EcoRI | BamHI | amp ^R | ori |
|-------|---|------------------|-----|---|---|-------|-------|------------------|-----|
| A | B | C | D | | | | | | |
| EcoRI | BamHI | amp ^R | ori | | | | | | |

52. Transgenic animal has

- a) Foreign DNA is all its cells b) Foreign RNA is all its cells
c) Foreign DNA is some of the cells d) Both 2 and 3
53. The term 'molecular scissors' refers to
a) recombinant DNA b) restriction enzymes c) Taq polymerase
d) palindromic nucleotide sequences.
54. Which one of the following is commonly used in transfer of foreign DNA into crop plants?
a) *Meloidogyne incognita* b) *Agrobacterium tumefaciens* c) *Penicillium expansum*
d) *Trichoderma harzianum*
55. An antibiotic resistance gene in a vector usually helps in the selection of:
a) competent cells b) transformed cells c) recombinant cells d) none of the above
56. Which one is not a restriction enzyme:
a) Eco R₁ b) Chitinase c) Bam H₁ d) Hind - II
57. Which of the following is a restriction endonuclease?
a) Protease b) DNase I c) RNase d) Hind II
58. The letter 'R' in EcoRI is derived from
a) the name of genus b) the name of strain c) the name of species
d) the term 'restriction'.
59. In vitro clonal propagation in plants is characterised by: _____.
a) PCR and RAPD b) Northern blotting c) Electrophoresis and HPLC d) Microscopy
60. Which of the following is the example of direct gene transfer:
a) Micronjection b) Electroporation c) Particle gun d) All the above
61. The gene 'rop' present in pBR322 cloning vector, codes for:
a) the proteins involved in the translation
b) the proteins involved in the replication of the plasmid
c) the proteins involved in the synthesis of ampicillin only
d) the proteins involved in the synthesis of tetracycline only.
62. The linking of antibiotic resistance gene with the plasmid vector became possible with _____.
a) DNA ligase b) Endonucleases c) DNA polymerase d) Exonucleases
63. In nematode resistance by RNA interference, some specific genes were introduced which form dsRNA. These were introduced in-
a) Nematode b) Host plant c) *Agrobacterium* d) All of these
64. Cry 1 endotoxins obtained from *Bacillus thuringiensis* are effective against:
a) Flies b) Nematodes c) Boll worms d) Mosquitoes
65. Choose the correct pair from the following.
a) Nucleases - Separate the two strands of DNA
b) Exonucleases - Make cuts at specific positions within DNA
c) Ligases - Join the two DNA molecules d) Polymerases - Break the DNA into fragments
66. Which of the following statements is not correct regarding EcoRI restriction endonuclease enzyme?

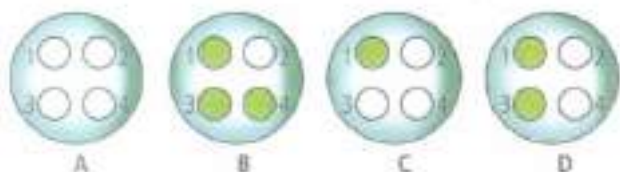
- a) It is isolated from *Escherichia coli* RY13
b) Its recognition sequence is 5'-GAATTC-3', 3'-CTTAAG-5'.
c) It produces complementary blunt ends d) None of these
67. The process of separation and purification of expressed protein before marketing is called _____.
a) Downstream processing b) Bioprocessing c) Post-production processing
d) Upstream processing
68. The *taq* polymerase enzyme is obtained from _____.
a) *Thermus aquaticus* b) *Thiobacillus ferrooxidans* c) *Bacillus subtilis*
d) *Pseudomonas putida*
69. One of the key factors, which makes the plasmid the vector in genetic engineering is
a) its resistance to antibiotics b) its resistance to restriction enzymes
c) its ability to carry a foreign gene d) its ability to cause infection in the host.
70. Which of the following is not a characteristic of pBR322 vector?
a) It was the first artificial cloning vector constructed in 1977 by Boliver and Rodriguez.
b) It is the most widely used, versatile and easily manipulated vector.
c) It has two antibiotic resistance genes tet^R and amp^R .
d) It does not have restriction site for *Sa*/I
71. Match column I with column II and select the correct answer from the given codes
- | Column - I | Column - II |
|-------------------------------|----------------------------------|
| A amp^R gene | i Artificial plasmid |
| B Separation of DNA fragments | ii Selectable marker |
| C HindIII | iii Electrophoresis |
| D pBR322 | iv <i>Haemophilus influenzae</i> |
- a) A-(iii), B-(ii), C-(i), D-(iv) b) A-(iv), B-(i), C-(iii), D-(ii) c) A-(ii), B-(iii), C-(iv), D-(i)
d) A-(ii), B-(iv), C-(i), D-(iii)
72. Find the odd one out:
a) vaccines - immunology b) eco degradation - pesticides
c) solar energy converter - pest control d) recombinant DNA - biotechnology
73. **Assertion:** Restriction enzymes recognise palindromic sequences.
Reason: Palindromic sequences read same in both directions of the two strands.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
74. What will be the effect if pBR322, a cloning vector does not carry 'ori' site?
a) Sticky ends will not produce. b) Transformation will not takes place.
c) The cell will transform into a tumour cell. d) Replication will not takes place.

75. **Assertion:** A bacterial cell with no restriction enzymes will be easily infected and lysed by bacteriophages.
Reason : Restriction enzymes catalyse synthesis of protective coat around bacterial cell that prevents bacteriophage attack.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
76. Second letter of the name of restriction endonuclease came from the:
a) Genus of organism b) Species of organism c) Family of organism
d) Class of organism
77. Tobacco plants resistant to a nematode have been developed by the introduction of DNA that produced (in the host cells):
a) an antifeedant b) a toxic protein c) both sense and anti-sense RNA
d) a particular hormone
78. **Assertion :** Asexual reproduction is more important with regard to biotechnology.
Reason : Asexual reproduction preserves the genetic information while sexual reproduction permits variations
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
79. Genetic engineering has been successfully used for producing:
a) transgenic Cow - Roise which produces high fat milk for making ghee
b) animals like bulls for farm work as they have super power
c) transgenic mice for testing safety of polio vaccine before use in humans
d) transgenic models for studying new treatments for certain cardiac diseases
80. A transgenic rice (Golden rice) has been developed for increased content of:
a) Vitamin A b) Vitamin B₁ c) Vitamin C d) Vitamin D
81. Gene silencing using RNAi technique is applied to make:
a) Nematode resistant plant b) Edible vaccines c) Iron fortified rice
d) Vitamin enriched cereales
82. Which one of the following enzyme is not involved in recombinant DNA technology
a) Exonuclease b) Endonuclease c) Ligase d) Catalase
83. Which of the following is required for micro-injection method of gene transfer?
a) Micro-particles b) Micro-pipettes c) Divalent cations d) UV radiations
84. In recombinant DNA technology, the term vector refers to:
a) the enzyme that cuts DNA into restriction fragments b) the sticky end of a DNA fragment
c) a plasmid used to transfer DNA into a living cell
d) a DNA fragment which carries only ori gene

85. Restriction endonuclease-
- a) cuts the DNA molecule randomly b) cuts the DNA molecule at specific sites
 - c) Restricts the synthesis of DNA inside the nucleus d) Synthesizes DNA
86. Which of the following contains the key tools for recombinant DNA technology?
- (i) Restriction endonucleases, ligases, vectors
 - (ii) Ligases, host organism, polymerase enzymes
 - (iii) Vectors, Taq polymerase, primers
 - (iv) Restriction exonucleases, ligases, primers, bioreactors
- a) (i), (ii) and (iii) b) (i) and (ii) c) (i), (iii) and (iv) d) (iii) and (iv)
87. **Assertion:** Downstream processing is generally considered more difficult and costlier in plants than in animals.
- Reason :** Rhizosecretion is used as a method to facilitate easier recovery of recombinant proteins from plants.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
88. Read the given statements and select the correct option.
- Statement 1 :** Both bacteria and yeast multiply very fast to form huge populations which express the desired gene.
- Statement 2 :** In recombinant DNA technology, human genes are often transferred into bacteria (prokaryotes) or yeast (eukaryotes).
- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct
- d) Both statements 1 and 2 are incorrect.
89. What is the criterion for DNA fragments movement on agarose gel during gel electrophoresis?
- a) The larger the fragment size, the farther it moves
 - b) The smaller the fragment size, the farther it moves
 - c) Positively charged fragments move to farther end
 - d) Negatively charged fragments do not move
90. During isolation of genetic material, the chemical used to precipitate out the purified DNA is
- a) bromophenol blue b) chilled ethanol c) ethidium bromide d) both (a) and (c).
91. PCR proceeds in three distinct steps governed by temperature they are in order of:
- a) Denaturation, Annealing, Synthesis b) Synthesis, Annealing, Denaturation
 - c) Annealing, Synthesis, Denaturation d) Denaturation, Synthesis, Annealing
92. The first clinical gene therapy was given for treating:
- a) Rheumatoid arthritis b) Adenosine deaminase deficiency c) Diabetes mellitus
 - d) Chicken pox
93. Significance of 'heat shock' method in bacterial transformation is to facilitate

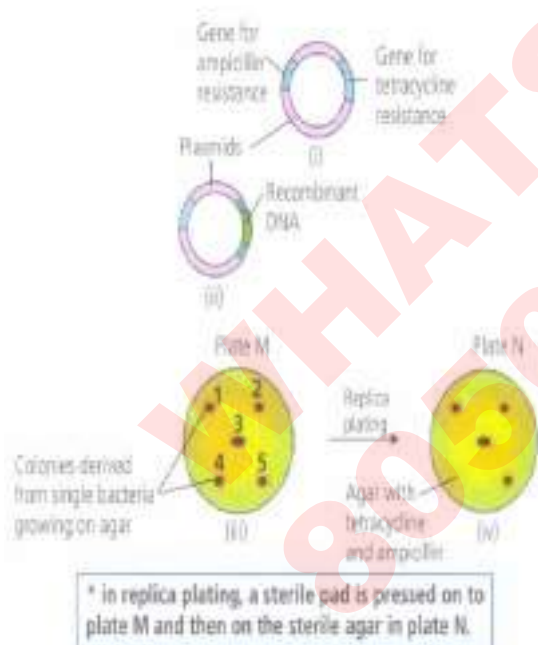
- a) binding of DNA to the cell wall b) uptake of DNA through membrane transport proteins
c) uptake of DNA through transient pores in the bacterial cell wall
d) expression of antibiotic resistance gene.
94. The DNA fragments separated on an agarose gel can be visualised after staining with _____.
a) Acetocarmine b) Aniline blue c) Ethidium bromide d) Bromophenol blue
95. The Ti plasmid, is often used for making transgenic plants. This plasmid is found in :
a) Yeast as a 2 μ m plasmid b) Azotobacter
c) Rhizobium of the roots of leguminous plants d) Agrobacterium
96. What is true about Bt toxin?
a) The concerned Bacillus has antitoxins
b) The inactive protoxin gets converted into active form in the insect gut
c) Bt protein exists as active toxin in the Bacillus
d)
The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication
97. The prerequisites for biotechnological production of antibiotics is
a) To search an antibiotic producing microorganism b) To isolate the antibiotic gene
c) To join antibiotic gene with E.coli plasmid d) All of the above
98. How many fragments will be generated on the digestion of a closed circular DNA molecule with a restriction enzyme having six recognition sites on the DNA?
a) 5 b) 7 c) 6 d) 9
99. PCR- technique is used in :
a) Production of transgenic microbes b) Production of genetically modified food
c) Forensic investigation d) r- DNA technique
100. Read the given statements and select the correct option.
Statement 1 : The cloning vector is required to have very few, preferably single, recognition sites for the commonly used restriction enzymes.
Statement 2 : Presence of more than one recognition sites within a cloning vector will generate several fragments, which will complicate the process of gene cloning.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
101. If a plasmid vector is digested with EcoRI at a single site then
a) one sticky end will be produced b) two sticky ends will be produced
c) four sticky ends will be produced d) six sticky ends will be produced.
102. The term 'recombinant DNA' refers to

- a) DNA of the host cell b) DNA with a piece of foreign DNA
c) DNA with selectable marker d) DNA with more than one recognition sites
103. The bacterium *Bacillus thuringiensis* is widely used in contemporary biology as:
a) Source of industrial enzyme b) Indicator of water pollution c) Insecticide
d) Agent for production of dairy products
104. Which of the following is not a cloning vector?
a) Cosmid b) pBR322 c) Sa/I d) Phagemid
105. Match column I with column II and select the correct answer from the given codes.
- | Column - I | Column - II |
|------------------------------|------------------------|
| A Recombinant DNA technology | i Chilled ethanol |
| B Precipitation of DNA | ii DNA staining |
| C Transposons | iii Jumping genes |
| D Ethidium bromide | iv Genetic engineering |
- a) A-(iv), B-(i), C-(iii), D-(ii) b) A-(i), B-(iii), C-(ii), D-(iv) c) A-(ii), B-(i), C-(iii), D-(iv)
d) A-(iv), B-(ii), C-(i), D-(iii)
106. Biolistics (gene-gun) is suitable for:
a) Constructing recombinant DNA by joining with vectors b) DNA finger printing
c) Disarming pathogen vectors d) Transformation of plants cells
107. A bacterium commonly used in plant genetic engineering is
a) *E. Coli* b) *Agrobacterium* c) *Mycobacterium* d) *Rhizobium*
108. GEAC makes decision regarding
a) the validity of GM research b) the safety of introducing GM organism for public services
c) the validity of biopatents d) more than one options are correct
109. Four mutant strains of bacteria (1 - 4) all require substance S to grow (each strain is blocked at one step in the S-biosynthesis pathway). Four plates were prepared with minimal medium and a trace of substance S, to allow a small amount of growth of mutant cells. On plate A, mutant cells of strain 1 were spread over entire surface of the agar to form a thin lawn of bacteria. On plate B, the lawn was composed of mutant cells of strain 2, and so on. On each plate, cells of each of the four mutant types were inoculated over the lawn, as indicated in the figure by the circles. Dark circles indicate excellent growth. A strain blocked at a later step in the S substance metabolic pathway accumulates intermediates that can 'feed' a strain blocked at an earlier step.



- What is the order of genes (1 - 4) in the metabolic pathway for synthesis of substance S?
a) $2 \rightarrow 4 \rightarrow 3 \rightarrow 1$ b) $2 \rightarrow 1 \rightarrow 3 \rightarrow 4$ c) $1 \rightarrow 3 \rightarrow 4 \rightarrow 2$ d) $1 \rightarrow 2 \rightarrow 4 \rightarrow 3$
110. Human insulin is being commercially produced from a transgenic species of:
a) *Mycobacterium* b) *Rhizobium* c) *Saccharomyces* d) *Escherichia*

111. *Agrobacterium tumefaciens* used in Genetic engineering for:
 a) DNA - mapping b) DNA - modification c) Gene transfer d) DNA finger printing
112. Given below is a sample of a portion of DNA strand giving the base sequence on the opposite strands?
 5' _____ GAATTC _____ 3'
 3' _____ CTTAAG _____ 5'
- What is so special shown in it?
 a) Replication completed b) Deletion mutation c) Start codon at the 5' end
 d) Palindromic sequence of base pairs
113. DNA ligase is an enzyme that catalyses the:
 a) splitting of DNA threads into small bits b) joining of the fragments of DNA
 c) denaturation of DNA d) synthesis of DNA
114. The first restriction endonuclease isolated was:
 a) EcoRI b) BamHI c) *san* d) HindII
115. Analyse the given diagram which shows steps involved in the procedure of selecting transformed bacteria.



- Identify the bacterial colony which has undergone transformation?
 a) Colony 5 b) Colony 2 c) Colony 4 d) Colony 3
116. Genetic material of Retroviruses is
 a) DNA b) RNA c) Protein d) ssDNA
117. Read the following four statement (A-D) about certain mistakes in two of them.
 (A) The first transgenic buffalo, Rosie produced milk which was human alpha- lactalbumin enriched.
 (B) Restriction enzymes are used in isolation of DNA form other macro molecules.
 (C) Downstream processing is one of steps of R-DNA technology.
 (D) Disarmed pathogen vectors are also used in transfer of R-DNA into the host.
- Which are the two statement having mistakes?

- a) Statement (A) and (B) b) Statement (B) and (C) c) Statement (C) and (D)
d) Statement (A) and (C)
118. Purines found both in DNA and RNA are _____.
a) Adenine and guanine b) Guanine and cytosine c) Cytosine and rhyennine
d) Adenine and thymine
119. Agrobacterium tumefaciens contains contains a large plasmid, which induces tumour in the plants it is termed as-
a) Ti plasmid b) Ri plasmid c) recombinant plasmid d) Shine Delgrano sequence
120. Tumor including plasmid transforms
a) Nematodes b) Bacteria c) Fungi d) Several dicot plants
121. The term 'chemical knife' refers to
a) endonucleases b) cellulases c) polymerases d) endonucleases
122. The bacteria Pseudomonas is useful because of its ability to:
a) Transfer genes from one plant to another
b) Decompose a variety of organic compounds c) Fix atmospheric nitrogen in the soil
d) Produce a wide variety of antibiotics
123. Find out correct recognisation sequence of following restriction endonuclease enzyme:
a)

	Bam HI	Eco RI
(1)	GGATCC	GAATTC
	CCTAGG	CTTAAG

b)

	Bam HI	Eco RI
(2)	GAATCAATTGCAAC	
	CTTAGTT	AACGTTG

c)

	Bam HI	Eco RI
(3)	GCATGGAGCTCC	
	CGTACC	TCGAGG

d)

	Bam HI	Eco RI
(4)	GACTAAGCCTTA	
	CTGATT	CGGAAT
124. The process of RNA interference has been used in the development of plants resistant to:
a) Nematodes b) Fungi c) Viruses d) Insects
125. Which of the following correctly depicts the recognition site for EcoRI?
a) $G - A - A - T - \overset{\downarrow}{T} - C$ b) $G - T - C \overset{\downarrow}{-} G - A - C$
 $C - T - T - A - \underset{\uparrow}{A} - G$ $C - A - G \overset{\uparrow}{-} C - T - G$
c) $G \overset{\downarrow}{-} T - C - G - A - C$ d) $G \overset{\downarrow}{-} A - A - T - T - C$
 $C - A - G - C - T \overset{\uparrow}{-} G$ $C - T - T - A - A \overset{\uparrow}{-} G$
126. The most important feature in a plasmid to be used as a vector is:
a) origin of replication (on) b) presence of a selectable marker
c) presence of sites for restriction endonuclease d) its size
127. In bacteria, plasmid is _____.
a) extra - chromosomal material b) main DNA c) non-functional DNA d) repetitive gene
128. If you want to recover many copies of the target DNA, you will choose a vector:

- a) which does not have origin of replication b) which has antibiotic resistance gene
c) whose origin supports high copy number d) which has only one restriction site
129. Identify the palindromic sequence in the following.
a) $\frac{GAATTC}{CTTUUG}$ b) $\frac{GGATCC}{CCTAGG}$ c) $\frac{CCTGG}{GGACC}$ d) $\frac{CGATA}{GCTAA}$
130. Which of the following enzyme is used to join DNA fragments:
a) Terminase b) Endonuclease c) Ligase d) DNA polymerase
131. Which of following feature is not necessary for cloning vector-
a) Oringin of replication b) high copy number c) selectable marker d) Cloning sites
132. While isolating DNA from bacteria, which of the following enzymes is not used?
a) Lysozyme b) Ribonuclease c) Deoxyribonuclease d) Protease
133. RNAi results in
a) Silencing of m-RNA translation
b) Silencing of a specific m-RNA due to complementary ds RNA molecule.
c) Silencing of m-RNA molecule d) Silencing of DNA for m-RNA transcription
134. Which one of the following represents a palindromic sequence in DNA?
5'- CATTAG-3' 5'-GATACC-3' 5'-GAATTC-3' 5'-CCAATG-3'
a) 3'-GATAAC-5' b) 3'-CCTAAG-5' c) 3'-CTTAAG-5' d) 3'-GAATCC-5'
135. Who is the father of genetic engineering?
a) Steward Linn b) Stanley Cohen c) Paul Berg d) Kary Mullis
136. Which one of the foolowing has found extensive use in genetic engineering work in plants
a) Bacillus coagulens b) Agrobacterium tumefaciens c) Clotridium septicum
d) Xanthomonas citri
137. A bacterial cell was transformed with a recombinant DNA that was generated using a human gene. However, the transformed cells did not produce the desired protein. Reasons could be
a) human gene may have intron which bacteria cannot process
b) amino acid codons for humans and bacteria are different
c) human protein is formed but degraded by bacteria d) all of the above.
138. Which of the following is not a source of restriction endonuclease?
a) Haemophilus influenzae b) Escherichia coli c) Entamoeba coli
d) Bacillus amyloliquifaciens
139. Plasmids are extra-chromosomal genetic material found in
a) Algae b) Mammalian bond c) Bacteria d) Viruses
140. The cutting of DNA at specific locations became possible with the discovery of _____.
a) Probes b) Selectable markers c) Ligases d) Restriction enzymes
141. Read the following statements and select the correct ones.
(i) Same kind of sticky ends are produced when a DNA has been cut by different restriction enzymes.
(ii) Exonucleases make cuts at specific positions within the DNA.

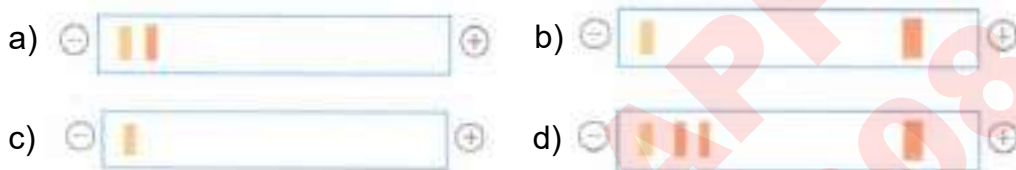
- (iii) Hind II was the first restriction endonuclease to be isolated.
- (iv) A bacteriophage has the ability to replicate within bacterial cells by integrating its DNA with bacterial DNA.
- (v) Presence of more than one recognition sites for an enzyme within the vector complicates the gene cloning.
- a) (i), (iii) and (v) b) (i) and (iv) c) (iii) and (iv) d) (ii), (iii) and (iv)
142. In a polymerase chain reaction, temperature required for the steps
- (i) Denaturation,
(ii) Annealing and
(iii) Extension are respectively
- a) (i) 94°C (ii) 40°C (iii) 72°C b) (i) 40°C (ii) 72°C (iii) 94°C c) (i) 94°C (ii) 72°C (iii) 40°C
d) (i) 72°C (ii) 94°C (iii) 40°C
143. Gel electrophoresis is used for _____.
- a) cutting of DNA into fragments. b) separation of DNA fragments according to their size.
c) construction of recombinant DNA by joining with cloning vectors.
d) isolation of DNA molecules.
144. The restriction enzyme EcoRI has the property of
- a) endonuclease activity b) exonuclease activity c) ligation activity
d) correcting the topology of replicating DNA
145. The stickiness of DNA ends facilitates the action of which enzyme:
- a) DNA polymerase b) DNA Ligase c) Restriction endonuclease
d) Alkaline phosphatase
146. Which of the following tools of recombinant DNA technology is incorrectly paired with its use?
- a) EcoRI - Production of sticky ends b) DNA ligase - Multiplication of rDNA molecules
c) ori- copy number d) Selectable marker - Identification of transformants
147. A device in which large volume of living cells are cultured in order to get a specific product is called
- a) PCR b) agitator c) bioreactor d) assimilator
148. Which of the following should be chosen for best yield if one were to produce a recombinant protein in large amounts?
- a) Laboratory flask of largest capacity
b) A stirred-tank bioreactor without in-lets and out-lets c) A continuous culture system
d) Any of the above
149. Which of the following bacteria is used as a vector for plant genetic engineering?
- a) *Agrobacterium tumefaciens* b) Bacteriophages c) *Thermus aquaticus*
d) *Pyrococcus furiosus*
150. Bt-cotton has which of the following special features?
- a) This plant is completely resistant to insects b) It requires less fertilizers
c) Its leaf is resistant to pest but boll is destroyed by bollworms

- d) This plant is resistant to certain insects
151. In EcoRI, R is stand for
a) Strain b) Species c) Genus d) order
152. The DNA molecule to which the gene of interest is integrated for cloning is called _____.
a) Vector b) Template c) Canier d) Transformer
153. Micro-injection is a method used to
a) produce sticky ends of DNA b) provide protection against pathogen c) purify the DNA
d) inject recombinant DNA into the nucleus of an animal cell.
154. Using recombinant DNA technology, genes from a donor cell can be inserted into a bacterium for DNA replication and protein synthesis. The kind of cells that can be used as gene donors in this technology are
a) bacteria only b) either yeast or bacteria c) eukaryotic cells only d) any of these.
155. Which one is used as a vector for gene transfer cloning gene?
a) Salmonella typhimurium DNA b) Ti plasmid c) Antibiotic resistance Amp' and Ter' loci
d) Ori minus pBR 322
156. **Assertion:** All expression vectors are cloning vectors and vice versa.
Reason: Expression vectors have at least the regulatory sequences i.e., promoters, operators, ribosomal binding sites, etc. having optimum function in the chosen control but not origin of replication.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
157. The term "competent" refers to:
a) increasing the competition between cells b) making cells impermeable for DNA
c) increasing the efficiency with which DNA enters the bacterium through pores in its cell wall
d) making cells permeable for divalent cations.
158. During the processing of the prohormone "proinsulin" into the mature "insulin"
a) C - peptide is added to proinsulin b) C - peptide is removed from proinsulin
c) B - peptide is added to proinsulin d) B - peptide is removed from proinsulin
159. "Transgenic" plants are produced by:
a) Inducing gene mutation b) Arresting spindle fibre formation
c) Deleting sex chromosomes d) Introducing foreign genes
160. In RDT, the term vector refers to
a) Plasmids that can transfer foreign DNA into a living cell
b) Plasmids that can cut DNA at specific bases
c) Plasmids that can join DNA at specific bases
d) Plasmids that can degrade harmful proteins
161. Genetic modification (GM) has been used to:

- a) Create tailor made plants b) Supply alternative resources to industries
c) Enhanced nutritional value of food d) All of the above
162. The restriction enzyme(s) used in recombinant DNA technology making staggered cuts in DNA leaving sticky ends is/ are:
a) Eco RI b) HindIII c) BamHI d) All of the above
163. Which of the following is the example of chemical scissors:
a) Eco - RI b) Hind - III c) Bam - I d) All the above
164. The nucleic acid extracted from animal liver is loaded and run on agarose gel. After staining, it shows following pattern:



If the remaining sample is treated with RNase and loaded in gel what result would you expect?



165. Which of the following method is not used for gene transfer in plants?
a) Biolistics b) Micropropagation c) Microinjection d) Agrobacterium co-culture
166. Read the following statements and select the correct ones.
(i) Electrophoresis is a technique used for the separation of molecules based on their size and charge.
(ii) Plasmids are extra-chromosomal, self-replicating, usually circular, double stranded DNA molecules found naturally in many bacteria and also in some yeast.
(iii) It is not advisable to use an exonuclease enzyme while producing a recombinant DNA molecule.
(iv) In EcoRI, the roman numeral I indicates that it was the first enzyme isolated from E.coli RY 13.
a) (i) and (ii) b) (iii) and (iv) c) (i), (ii) and (iv) d) (i), (ii), (iii) and (iv)
167. **Assertion:** Special methods are used for transformation i.e., incorporation of recombinant DNA into host.
Reason: DNA is a hydrophilic molecule.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
168. Which of the following is required to perform polymerase chain reaction?
a) Primers, dNTPs and DNA polymerase b) DNA, CaCl₂ and nuclease c) Mg⁺², DNA
d) Both (a) and (c)
169. Match the scientists in column I with their related discoveries in column II and select the correct option from the given codes.

Column - I	Column - II
A Kary Mullis	i Father of genetic engineering
B Paul Berg	ii Nobel prize for the discovery of restriction endonucleases
C Stanley Cohen and Herbert Boyer	iii Developed polymerase chain reaction
D Arber, Smith and Nathan	iv Isolated an antibiotic resistant gene from a plasmid of the bacterium <i>Salmonella typhimurium</i>

- a) A-(iii), B-(i), C-(iv), D-(ii) b) A-(iii), B-(iv), C-(i), D-(ii) c) A-(iv), B-(ii), C-(iii), D-(i)
d) A-(i), B-(iii), C-(iv), D-(ii)

170. Which one of the following palindromic base sequences in DNA can be easily cut at about the middle by some particular restriction enzyme?

- 5' _____ GAATTC _____ 3' 5' _____ CACGTA _____ 3'
a) 3' _____ CTTAAG _____ 5' b) 3' _____ CTCAGT _____ 5'
5' _____ CGTTTCG _____ 3' 5' _____ GATATG _____ 3'
c) 3' _____ ATGGTA _____ 5' d) 3' _____ CTACTA _____ -5'

171. DNA cannot pass through a cell membrane as

- a) it is too big to cross the membrane b) it is a hydrophilic molecule
c) membrane does not have specific proteins to facilitate the transport d) none of these.

172. The different steps of recombinant DNA technology are given below randomly.

- (i) Isolation of the DNA fragments or genes to be cloned
(ii) Introduction of the recombinant DNA into a suitable cell (usually *E. coli*) called host (transformation)
(iii) Multiplication/expression of the introduced gene in the host
(iv) Selection of the transformed host cells, and identification of the clone containing the desired gene/DNA fragment
(v) Insertion of the isolated gene in a suitable plasmid vector Which of the following represents the correct sequence of steps?
a) (i) → (iii) → (ii) → (iv) → (v) b) (iii) → (ii) → (i) → (v) → (iv)
c) (i) → (v) → (ii) → (iv) → (iii) d) (v) → (i) → (iii) → (iv) → (ii)

173. The transfer of genetic material from one bacterium to another through the mediation of a vector like virus is termed as

- a) transduction b) conjugation c) transformation d) translation

174. Match the following columns:

Column I	Column II
A Golden rice	i Eli Lilly
B PCR	ii Herbert boyer
C Insulin	iii Kary mullis
D Recombin	iv peter Bayer

- a) A-iv, B-iii, C-i, D-ii b) A-iv, B-iii, C-ii, D-i c) A-iii, B-iv, C-i, D-ii d) A-iii, B-iv, C-ii, D-i

175. Two bacteria found to be very useful in genetic engineering experiments are _____.

- a) Nitrosomonas and Klebsiella b) Escherichia and Agrobacterium
c) Nitrobacter and Azotobacter d) Rhizobium and Diplococcus

176. Which of the following steps are catalysed by Taq polymerase in a PCR reaction?

- a) Denaturation of template DNA b) Annealing of primers to template DNA
c) Extension of primer end on the template DNA d) All of the above

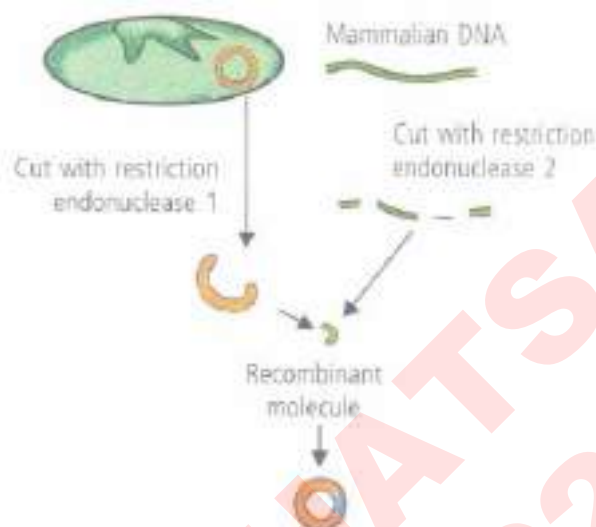
177. Taq - polymerase which is used for amplification of DNA related with:

- a) Hybridoma technique b) PCR - technique c) Gene cloning d) r- DNA technology

178. Genetically engineered human insulin is called:

- a) Humulin b) Haematin c) Hybridoma d) Hybrid

179. The basic procedure involved in the synthesis of recombinant DNA molecule is depicted below. The mistake in the procedure is



- a) Enzyme polymerase is not included. b) The mammalian DNA is shown double stranded.
c) Two different restriction enzymes are used. d) Only one fragment is inserted.

180. **Assertion:** E.coli having pBR322 with DNA insert at BamHI site cannot grow in medium containing tetracycline.

Reason: Recognition site for BamHI is present in tet^R region of pBR322.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false. d) If both assertion and reason are false.

181. Which of the following statements are correct?

- (i) Restriction enzymes cut the strand of DNA a little away from the centre of the palindrome site, but between the same two bases on the opposite strands.
(ii) Hind II always cuts DNA molecules at a particular point by recognising a specific sequence of six base pairs.
(iii) Separated DNA fragments cannot be visualised without staining on an agarose gel electrophoresis.
(iv) 'Ori' is the sequence responsible for controlling the copy number.
(v) DNA is a positively charged molecule.

- a) (i), (iii) and (v) b) (i), (ii), (iii) and (iv) c) (iii), (iv) and (v) d) (i), (ii), (iii), (iv) and (v)

182. The sticky ends of a fragmented DNA molecule are made of
a) calcium salts b) endonuclease enzyme c) unpaired bases d) methyl groups
183. Who is given the credit for constructing first artificial recombinant molecule?
a) Hargobind Khorana b) Stanley Cohen and Herbert Boyer c) Linus Pauling
d) Arber and Nathans
184. In recombinant DNA technology, a plasmid vector is cleaved by:
a) modified DNA ligase b) a heated alkaline solution
c) the same enzyme that cleaves the donor DNA
d) the different enzymethan that cleaves the donor DNA
185. Which is pallindromic sequence:
GAATTC GCAAAG ATCGGC ATCGCT
a) CTTAAG b) CGTTTC c) TAGCCG d) TAGCGA
186. Read the given statements and select the correct option.
Statement 1: The tumour inducing plasmid (Ti plasmid) acts as a cloning vector in recombinant DNA technology.
Statement 2: The Ti plasmid which is used in the mechanisms of delivering genes to a cell remains pathogenic.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
187. During insertional inactivation, the presence of a chromogenic substrate gives blue coloured colonies if the plasmid in the bacteria does not have an insert. The blue colour is produced by the enzyme
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
188. A genetically engineered micro- organism used successfully in bioremediation of oil spills is a species of:
a) Pseudonas b) Trichoderma c) Xanthomonas d) Bacillus
189. The specific DNA sequence where EcoRI cuts is
a) GATTCTG b) GAATTC c) GTTCAA d) TTCCAA
190. Process used for amplification or multiplication of DNA in DNA fingerprinting is
a) polymerase chain reaction b) southern blotting c) northern blotting d) none of these.
191. Bacteria possessing restriction endonucleases remain:
a) Affected by bacteriophages b) Resistant to bacteriophages c) Resistant to drugs
d) Resistant to heat

192. The tumor inducing capacity of _A_ is located in large extra-chromosomal plasmid called Ti plasmid. Choose the option which correctly fills up the blanks _A_
- a) *Thermus aquaticus* b) *Salmonella typhimurium* c) *E.coli*
 - d) *Agrobacterium tumefaciens*
193. Which one of the following techniques made it possible to genetically engineer living organism?
- a) Hybridization b) Recombinant DNA techniques c) X- ray diffraction
 - d) Heavier isotope labelling
194. The C - prepeptide is
- a) not present in proinsulin b) present in mature insulin
 - c) removed during maturation of insulin d) also present in artificial insulin
195. Manipulation of DNA in genetic engineering became possible due to the discovery of:
- a) Restriction endonuclease b) DNA ligase c) Transcriptase d) Primase
196. The protein products of the following Bt toxin genes cryIAC and cryIIAb are responsible for controlling:
- a) Balloworm b) Roundworm c) Moth d) Fruit fly
197. Which of the following microbes transform normal plant and animal cells to cancerous cells respectively?
- a) Retroviruses and *Rhizobium* b) *Escherichia coli* and *Agrobacterium tumefaciens*
 - c) *Agrobacterium tumefaciens* and Retroviruses
 - d) *Agrobacterium tumefaciens* and *A.rhizogenes*
198. What is antisense technology?
- a) A cell displaying a foreign antigen used for synthesis of antigens.
 - b) Production of somaclonal variants in tissue cultures.
 - c)
- When a piece of RNA that is complementary in sequence is used to stop expression of a specific gene.
- d) RNA polymerase producing DNA.
199. Restriction enzymes are:
- a) Not always required in genetic engineering b) Essential tool in genetic engineering
 - c) Nucleases that cleave DNA at specific sites d) (2) and (3) both
200. Which of the following is not required in PCR-
- a) DNA primer b) DNA template c) RNA primer d) Taq polymerase
201. In addition to Taq polymerase enzyme which other thermostable DNA polymerases have been isolated to be used in polymerase chain Reaction (PCR)?
- a) Pfu polymerase isolated from *Pyrococcus furiosus*
 - b) Tti polymerase (vent polymerase) isolated from *Thermococcus litoralis*
 - c) Both (a) and (b) d) None of these

202. The colonies of recombinant bacteria appear white in contrast to blue colonies of non-recombinant bacteria because of _____.
a) Insertional inactivation of alpha-galactosidase in non-recombinant bacteria
b) Insertional inactivation of alpha-galactosidase in recombinant bacteria
c) Inactivation of glycosidase enzyme in recombinant bacteria
d) Non-recombinant bacteria containing beta-galactosidase
203. Restriction enzyme Eco RI cuts the DNA between bases G and A only when the sequence DNA is:
a) GATATC b) GAATTC c) GATTCC d) GAACTT
204. Having become an expert on gel electrophoresis, you are asked to examine a gel. Where would you find the smallest segments of DNA?
a) Near the positive electrode, farthest away from the wells
b) Near the negative electrode, close to the wells
c) Near the negative electrode, farthest away from the wells
d) Near the middle, they tend to slow down after the first few minutes.
205. Which is not correctly matched:
a) Agrobacterium \Rightarrow Ti- plasmid b) Cosmid \Rightarrow Vector DNA
c) Rhizobium \Rightarrow Asymbiotic N_2 - fixer d) Albinism \Rightarrow Autosomal recessive gene
206. Which one of the following characteristics is generally not preferred for a cloning vector?
a) An origin of replication b) An antibiotic resistance marker c) Multiple restriction sites
d) A high copy number
207. A foreign DNA and plasmid cut by the same restriction endonuclease can be joined to form a recombinant plasmid using:
a) Eco RI b) Taq polymerase c) Polymerase III d) Ligase
208. What is the nature of plasmid?
a) Found in viruses b) Contains genes for vital activities c) Part of nuclear chromosome
d) Widely used in gene transfer
209. If a recombinant DNA bearing gene for resistance to antibiotic ampicillin is transferred to E.coli cells, the host cells become transformed into ampicillin resistant cells. If such bacteria are transferred on agar plates containing ampicillin, only transformants will grow and the untransformed recipient cells will die. The ampicillin resistant gene in this case is called as
a) selectable marker b) recombinant protein c) cloning site d) chemical scalpels
210. Chromosomes in bacterial cell can be 1-3 in number and _____.
a) can be circular as well as linear within the same cell. b) are always circular.
c) are always linear. d) can be either circular or linear, but never both within the same cell.
211. Silencing of mRNA has been used in producing transgenic plants resistant to:
a) Bacterial blights b) Bollworms c) Nematodes d) White rusts
212. Consumption of which one of the following foods can prevent the kind of blindness associated with vitamin 'A' deficiency?
a) Golden rice b) Bt-Brinjal c) Flavr savr tomato d) Canola

213. A giant rat is formed in the laboratory, what is the reason:
a) Gene mutation b) Gene synthesis c) Gene manipulation d) Gene replication
214. Which of the following is not a component of downstream processing?
a) Separation b) Purification c) Preservation d) Expression
215. Commonly used vectors for human genome sequencing are _____.
a) T-DNA b) BAC and YAC c) Expression Vectors d) kT/A Cloning Vectors
216. **Assertion:** The matrix used in gel electrophoresis should have controllable pore size.
Reason : Agarose concentration can be changed to change pore sizes.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
217. Which one of the following is a case of wrong matching?
a) Somatic hybridization - Fusion of two diverse cells
b) Vector DNA - Site for tRNA synthesis
c) Micro propagation - In vitro production of plants in large numbers
d) Callus - Unorganized mass of cells
218. A single strand of nucleic acid tagged with a radioactive molecule is called _____.
a) Vector b) Plasmid c) Selectable marker d) Probe
219. The term "molecular scissors" generally refers to:
a) DNA polymerases b) RNA polymerases c) Restriction endonucleases
d) DNA ligases
220. **Assertion:** Genetic engineering requires both nucleases and ligases.
Reason: Ligases produce the nick in the recombinant DNA molecule.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.
221. Cultivation of Bt cotton has been much in the news. The prefix "Bt" means:
a) "Barium - treated" cotton seeds.
b) "Bigger thread" variety of cotton with better tensile strength.
c) Produced by "biotechnology" using restriction enzymes and ligases.
d) Carrying an endotoxin gene from *Bacillus thuringiensis*.
222. The use of bio - resources by multinational companies & other organisations without proper authorisation from the countries & people concerned, is known as-
a) Biopatent b) Biopiracy c) Biower d) Biodiversity
223. Which of the following sequence is palindromic?
GAATTC ATGCAG ATGCAG TGCATC
a) CTTAAG b) TACGTC c) TACGTC d) ACGTAG
224. The microinjection of desired genes from other organism into fertilized eggs of animals results in?

- a) monstrosities b) free Martins c) transgenic animals d) twins
225. A restriction endonuclease breaks bonds between the
a) base pairs of a DNA molecule b) base pairs of a DNA-RNA hybrid molecule
c) sugar and phosphate components of a nucleic acid molecule
d) exons and introns of a DNA molecule.
226. In a polymerase chain reaction after the denaturation step why the mixture needs to cool down to a lower temperature?
a) To permit specific annealing of the primers b) To give a halt to the reaction mixture
c) To increase the activity of enzyme Taq polymerase
d) To obtain the multiple copies of the DNA
227. Which of following is not true for cloning vector
a) more than two origin site of replication b) Vector should have selectable marker gene
c) single recognition site for the commonly used restriction enzyme
d) pBR-322 have tetracycline resistance
228. In the isolation of DNA, removal of protein and RNA is carried out by enzymes _____ and _____ respectively.
a) lysozyme, ribonuclease b) protease, cellulase c) protease, ribonuclease
d) ribonuclease, chitinase
229. Gel electrophoresis is used for
a) construction of recombinant DNA by joining with cloning vectors
b) isolation of DNA molecules c) cutting of DNA into fragments
d) separation of DNA fragments according to their size.
230. BACs and YACs are:
a) Natural DNA obtained from bacteria and yeast
b) Useful vectors foreucaryotic gene transfer
c) Artificial DNA obtained from bactericial and yeast d) (2) & (3) both
231. Bt - cotton is resistant for:
a) Round - Worm b) Fluke - Worm c) Boll - Worm d) Pin - Worm
232. The polymerase chain reaction is a technique used for
a) amplification of DNA b) amplification of enzymes c) amplification of proteins
d) all of these.
233. Identify the wrong statement with regard to restriction enzymes.
a) They are useful in genetic engineering.
b) sticky ends can be joined by using DNA ligases.
c) Each restriction enzyme functions by inspecting the length of a DNA sequence.
d) They cut the strand of DNA at palindromic sites.
234. Which one of following is method of gene silencing
a) tRNA b) rRNA c) RNAi d) mRNA

235. **Assertion** : In a chemical engineering process, it is necessary to prepare sterile ambience.
Reason : Sterile ambience inhibits the growth of undesirable microbes during manufacture of product like antibiotics, vaccines and enzymes
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
236. In the process of insertional inactivation:
- a)
a recombinant DNA is inserted within the coding sequence of enzyme β -galactosidase, resulting in inactivation of the enzyme
- b)
a recombinant DNA is inserted within the coding sequence of proteins involved in the replication of the plasmid
- c) a recombinant DNA is inserted within the recognition site for EcoRI
- d) none of the above.
237. When the genotype of an organism is improved by the addition of foreign gene, the process is called?
- a) Tissue culture b) Genetic diversity c) Genetic Engineering d) Plastic surgery
238. DNA or RNA segment tagged with a radioactive molecule is called _____.
a) Vector b) Probe c) Clone d) Plasmid
239. Select the correct option to fill up the blanks.
- (i) _____ is a natural polymer extracted from _____.
- (ii) The DNA fragments purified by gel electrophoresis are used in constructing _____ by joining them with _____.
- (iii) The ligation of alien DNA is carried out at a _____ present in one of the two _____ in a plasmid vector.
- (iv) _____ enzyme remains active during the high temperature induced denaturation of ds DNA.
- (v) DNA fragments are resolved according to their _____ through _____ in agarose gel electrophoresis.
- a)
(i) Agarose, sea weeds (ii) recombinant DNA, cloning vector (iii) restriction site, antibiotic resistance genes (iv) Taq polymerase (v) size, sieving effect
- b)
(i) Agarose, sea weeds (ii) Restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerase (v) size, sieving effect

c)

(i) Agarose, sea weeds (ii) restriction site, antibiotic resistance genes (iii) recombinant DNA, cloning vector (iv) Taq polymerase (v) size, sieving effect

d)

(i) Size, sieving effect (ii) agarose, sea weeds (iii) recombinant DNA, cloning vector (iv) Taq polymerase (v) restriction site, antibiotic resistance genes

240. For transformation, micro-particles coated with DNA to be bombarded with gene gun are made up of _____.

a) Silver or Platinum b) Platinum or Zinc c) Silicon or Platinum d) Gold or Tungsten

241. The correct order of steps in Polymerase Chain Reaction (PCR) is :

a) Denaturation, Extension, Annealing b) Annealing, Extension, Denaturation

c) Extension, Denaturation, Annealing d) Denaturation, Annealing, Extension

242. Important objective of biotechnology in agriculture section is

a) To produce pest resistant varieties of plants b) To increase the nitrogen content

c) To decrease the seed number d) To increase the Plant weight

243. Given table gives an account of differences between PCR and gene cloning. Which of the following points shows the incorrect difference?

	Parameter	PCR	Gene cloning
1.	Efficient	More	Less
2.	Apparatus Requirement	DNA	Restriction enzyme, ligase, vector, bacterial cell
3.	Manipulation	in vitro	in vitro and in vivo
4.	Cost	More	Less
5.	Automation	Yes	No
6.	Error probability	Less	More
7.	Time for a typical experiment	2-4 days	4 hours
8.	Application	More	Less

a) 1 and 3 b) 4, 5 and 6 c) 4 and 7 d) 4, 7 and 8

244. T-DNA for gene transfer is present in:

a) *Bacillus thuringiensis* b) *Meloidogyne incognita* c) *Agrobacterium tumefaciens*d) *E. coli*

245. First transgenic plant:

a) Potato b) Tomato c) Tobacco d) Maize

246. Which of the following is used as a best genetic vector in plants:

a) *Bacillus thuringiensis* b) *Agrobacterium tumefaciens* c) *Pseudomonas putida*

d) All of these

247. Which of the following is not a feature of the plasmid?

a) Single stranded b) Independent replication c) Circular structure

d) Small, circular double-stranded

248. Primers are

- a) chemically synthesised oligonucleotides that are complementary to the regions of DNA
b) chemically synthesised oligonucleotides that are not complementary to the regions of DNA
c) chemically synthesised, autonomously replicating circular DNA molecules
d) specific sequences present on recombinant DNA.
249. Which of the following is not a genetically modified plant?
a) Bt-cotton b) Flavr savr tomato c) Pusa swarnim d) Golden rice
250. Modern biotechnology consist:
a) Genetic engineering b) tissue culture c) Microbiology d) All the above
251. What is true for plasmid?
a) Plasmids are widely used in gene transfer. b) These are found in virus.
c) Plasmid contains gene for vital activities. d) These are main part of chromosome.
252. Which of the following statements does not hold true for restriction enzyme?
a) It recognises a palindromic nucleotide sequence. b) It is an endonuclease.
c) It is isolated from viruses.
d) It produces the same kind of sticky ends in different DNA molecules.
253. Plasmid has been used as vector because:
a) It is circular DNA which have capacity to join to eukaryotic DNA.
b) it can move between prokaryotic and eukary- otic cells. c) Both ends show replication.
d) It has antibiotic resistance gene.
254. The function of polymerase chain reaction (PCR) is:
a) translation b) transcription c) DNA amplification d) None of these
255. A kind of Biotechnology involving manipulation of DNA is
a) DNA replication b) Genetic engineering c) Denaturation d) Renaturation
256. Restriction endonucleases are used in genetic engineering to form
a) Recombinant molecule of protein b) Recombinant molecule of DNA
c) Recombinant molecule of protein & DNA d) Recombinant cell
257. An improved variety of transgenic basmati rice:
a) is completely resistant to all insect pests and diseases of paddy
b) gives high yield but has no characteristic aroma
c) does not require chemical fertilizers and growth hormones
d) gives high yield and is rich in vitamin A
258. Which kind of therapy was given in 1990 to a four year old girl with adenosine deaminase (ADA) deficiency?
a) Gene therapy b) Chemotherapy c) Immunotherapy d) Radiation therapy
259. Stirred tank bioreactors have been designed, for _____.
a) addition of preservatives to the product. b) purification of the product.
c) ensuring anaerobic conditions in the culture vessel.
d) availability of oxygen throughout the process

260. Which of the following is correct match

	Column - I		Column - II
A	ADA - deficiency	i	α -1 antitrypsin
B	Emphysema	ii	Bone marrow transplatation
C	Insulin	iii	Diabetes mellitus
D	insect resistance	iv	T ₁ - Plasmid

- a) A(ii), B(i), C(iii), D(iv) b) A(i), B(ii), C(iii), D(iv) c) A(iii), B(iv), C(ii), D(i)
d) A(iv), B(iii), C(ii), D(i)

261. Which of the following statements are correct for the enzyme Taq polymerase?

- (i) It remains active during the high temperature induced denaturation of dsDNA.
(ii) It requires primers for carrying out the process of polymerisation.
(iii) It synthesises the RNA region between the primers, using dNTPs and Mg²⁺.
a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) None of these

262. Read the given statements and select the correct option.

Statement 1 : In insertional inactivation, blue colour produced by bacterial colonies indicates that the plasmid does not have an insert into the bacterial genome.

Statement 2 : Presence of insert results into insertional inactivation of β -galactosidase enzyme and the colonies do not produce any colour.

- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

263. **Assertion:** A piece of DNA inserted into an alien organism generally does not replicate if not inserted into a chromosome.

Reason: Chromosomes have specific sequences called 'ori' region where DNA replication is initiated.

- a) If both assertion and reason are false.
b) If both assertion and reason are true and reason is the correct explanation of assertion.
c) If both assertion and reason are true but reason is not the correct explanation of assertion.
d) If assertion is true but reason is false.

264. Which vector is commonly used in the transfer of gene in a crop plant.

- a) Plasmids of B. Subtilis b) Bacteriophages c) Ti - Plasmids of Agrobacterium
d) E. Coli Phages

265. There is a restriction endonuclease called EcoRI. What does "co" part in it stand for?

- a) colon b) coelom c) coenzyme d) coli

266. Genetic engineering is:

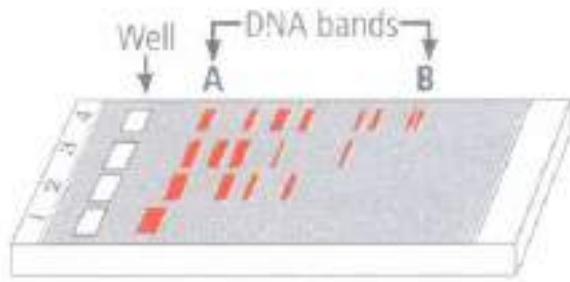
- a) study of extra nuclear gene b) Manipulation of genes by artificial method
c) Manipulation of RNA d) Manipulation of enzymes

267. In agarose gel electrophoresis, DNA molecules are separated on the basis of their

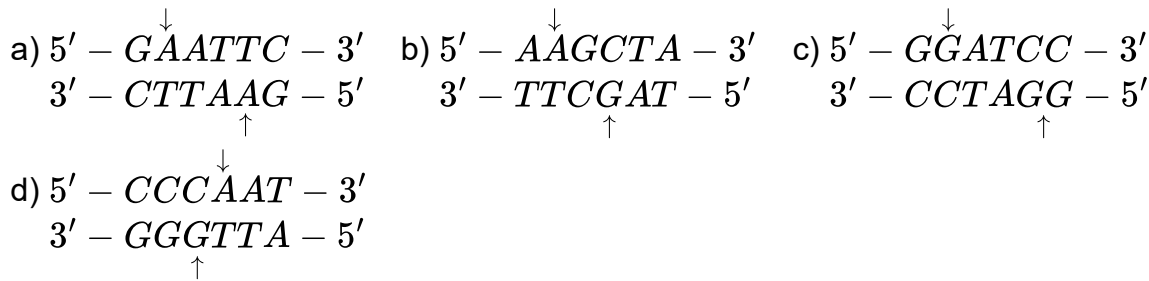
- a) separated on the basis of their b) size only c) charge to size ratio d) all of the above.

268. Which of the following peptide chain is not present in mature insulin.
a) A- peptide b) B- peptide c) C- peptide d) A & B peptides
269. Which of the following is not a tool of genetic engineering?
a) Cloning vector b) Restriction enzyme c) Foreign DNA d) GMO
270. The process of replication in plasmid DNA, other than initiation, is controlled by _____.
a) mitochondrial gene b) bacterial gene c) plasmid gene d) None of the above
271. Maximum number of existing transgenic animals is of:
a) Fish b) Mice c) Cow d) Pig
272. A suitable vector for gene cloning in higher organism is
a) Baculovirus b) Retrovirus c) *Salmonella typhimurium* d) *Neurospora crassa*
273. **Assertion :** Restriction enzymes *Hin* and *Hpa* are produced from two different genera of bacteria.
Reason: *Hin* is produced from *Haemophilus* while *Hpa* is produced from *Hematococcus*.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
274. The term 'chimeric DNA' refers to:
a) DNA with overhanging stretches b) DNA with palindromic sequence
c) a recombinant DNA d) molecular scissors
275. In genetic engineering, the antibiotics are used.
a) As selectable markers b) To select healthy vectors
c) As sequences from where replication starts d) To keep the culture free of infection
276. Which one is true statement regarding DNA polymerase used in PCR?
a) It is used to ligate introduced DNA in recipient cell b) It serves as a selectable marker
c) It is isolated from a virus d) It remains active at high temperature
277. Cry - gene which synthesizes crystal protein isolated from:
a) *Bacillus thuringiensis* b) *Rhizobium* c) *Bacillus polymyxa* d) *Colostridium*
278. Plasmid used to construct the first recombinant DNA was isolated from which bacterium species?
a) *Escherichia coli* b) *Salmonella typhimurium* c) *Agrobacterium tumefaciens*
d) *Thermus aquaticus*
279. Stirred-tank bioreactors have advantages over shake flasks because they
a) provide high temperature and pH b) provide better aeration and mixing properties
c) do not allow the entry of CO₂ d) are easy to operate.

280. Study the given figure carefully and select the incorrect statements regarding this.



- (i) It represents a typical agarose gel electrophoresis in which lane 1 contains undigested DNA.
 - (ii) Smallest DNA bands are formed at A and largest DNA bands are formed at B.
 - (iii) The separated DNA fragments can be visualized after staining in the visible light.
 - (iv) The separated DNA bands are cut out from the agarose gel and extracted from the gel piece. This step is known as elution.
- a) (i) and (ii) b) (ii) and (iii) c) (ii) and (iv) d) (i) and (iv)
281. Agarose extracted from seaweeds finds use in _____.
a) Spectrophotometry b) Tissue culture c) PCR d) Gel electrophoresis
282. The role of DNA ligase in the construction of a recombinant DNA molecule is:
a) formation of phosphodiester bond between two DNA fragments
b) formation of hydrogen bonds between sticky ends of DNA fragments
c) ligation of all purine and pyrimidine bases d) none of the above
283. Chimeric DNA is :
a) DNA which contains uracil b) DNA synthesized from RNA c) Recombinant DNA
d) DNA which contains single strand
284. Which one of the following is used as vector for cloning genes into higher organism?
a) Baculovirus b) Salmonellatyphimurium c) Rhizopus nigricans d) Retrovirus
285. In biolistic method of gene transfer, the microparticles coated with foreign DNA are bombarded into target cells at a very high velocity. These microparticles are made up of:
a) silver or tungsten b) arsenic or silver c) gold or tungsten d) none of these
286. Bt.toxin dose not show harmful effect on human and not target insect, because:
a) It is non toxic to animal and human b) It's receptors are not present in humans
c) Human and other animals have resistance against Bt. toxins
d) Acidic nature of stomach and absence of specific receptor on human gut.
287. Which of the following steps should be performed by a person in order to visualise the bands of DNA fragments obtained from gel electrophoresis?
a) Exposure of DNA fragments to UV radiations.
b) Staining with bromophenol blue followed by exposure to UV radiations.
c) Staining with ethidium bromide followed by exposure to UV radiations.
d) Person can see the bands without staining.
288. Which of the following sequences is recognised by restriction enzyme BamHI?



289. Golden rice is a promising transgenic crop. When released for cultivation, it will help in
a) Alleviation of vitamin A deficiency b) pest resistance c) Herbicide tolerance
d) Producing a petrol - like fuel from rice
290. Which of the following has popularised the PCR (polymerase chain reactions)?
a) Easy availability of DNA template b) Availability of synthetic primers
c) Availability of cheap deoxyribonucleotides
d) Availability of 'thermostable' DNA polymerase
291. Function of restriction endonuclease enzyme is:
a) Useful in genetic engineering b) protects the bacterial DNA against foreign DNA
c) Helpful in transcription d) Helpful in protein synthesis
292. pBR322 was the first artificial cloning vector to be constructed. What does "BR" stands for?
a) Bacteriophage and Recombinant b) Boliver and Rodriguez c) Boyer and Replicative
d) None of these
293. Which of the following is not naturally occurring gene:
a) cry - gene b) Bt - gene c) RNAi, gene d) Cellular defense gene
294. First artificially synthesised hormone is:
a) Secretin b) Insulin c) Glucagen d) Renin
295. Which of the following is related to genetic engineering?
a) Mutation b) plasmid c) Plastid d) Heterosis
296. The sequence that controls the copy number of the linked DNA in the vector, is termed.
a) Palindromic sequence b) Recognition site c) Selectable marker d) Ori site
297. The name of durg used in cancer treatment produced by biotechnology is
a) Interferon b) [HGH] Human growth hormone c) TSH d) insulin
298. What is the source of the Ti (Tumor inducing) plasmid which is modified and used as a cloning vector to deliver desirable genes into plants cells?
a) Agrobacterium tumifaciens b) Thermophilus aquaticus c) Pyrococcus furiosus
d) Aedes aegypti
299. According to EFB, "The integration of natural science and organisms, cells, parts thereof and molecular analogues for products and services," is known as:
a) Biochemistry b) Bioinformatics c) Biotechnology d) Biology
300. Polyethylene glycol method is used for _____.
a) biodiesel production. b) seedless fruit production. c) energy production from sewage.
d) gene transfer without a vector.

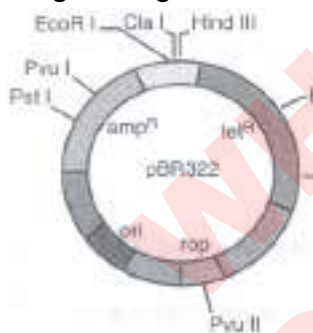
301. Match column I (enzyme) with column II (characteristic/ activity) and select the correct answer from the given codes.

Column I	Column II
A Taq DNA polymerase	i Cleaves the ends of linear DNA
B Exonuclease	ii Breakdown of fungal cell wall
C Protease	iii Stable above 90°C
D Chitinase	iv Made only by eukaryotic cells
	v Degradation of proteins

- a) A-(iii), B-(iv), C-(i), D-(ii) b) A-(iv), B-(iii), C-(i), D-(ii) c) A-(ij), B-(i), C-(v), D-(iii)
d) A-(iii), B-(i), C-(v), D-(ii)
302. Which of the given statements is correct in the context of observing DNA separated by agarose gel electrophoresis?
- a) DNA can be seen in visible light. b) DNA can be seen without staining in visible light.
c) Ethidium bromide stained DNA can be seen in visible light.
d) Ethidium bromide stained DNA can be seen under exposure to UV light.
303. 'Restriction' in restriction enzyme refers to
- a) cleaving of phosphodiester bond in DNA by the enzyme
b) cutting of DNA at specific position only
c) prevention of the multiplication of bacteriophage in bacteria d) all of the above.
304. Gel electrophoresis is a
- a) technique of separation of charged molecules under the influence of magnetic field
b) technique of incorporation of DNA molecules into the cell through transient pores made due to electrical impulses
c) technique of separation of DNA fragments through the pores of agarose gel under the influence of electric field
d) technique of separation and purification of gene products.
305. The correct sequence of making a cell competent is
- a) treatment with divalent cations → incubation of cells with recombinant DNA on ice → heat shock (42°C) → placing on ice
b) heat shock (42°C) → incubation of cells with recombinant DNA on ice → treatment with divalent cations → placing on ice
c) treatment with divalent cations → placing on ice → incubation of cells with recombinant DNA on ice → heat shock (42°C)
d) incubation of cells with recombinant DNA on ice → heat shock (42°C) → treatment with divalent cations → placing on ice

306. Genetically engineered bacteria have been used in commercial production of
a) Thyroxin b) testosterone c) Human insulin d) Melatonin
307. **Assertion :** Use of chitinase enzyme is necessary for isolation of DNA from yeast cells but not in case of Spirogyra.
Reason: Fungal cell wall is made up of fungal cellulose or chitin.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true and reason is the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
308. An enzyme catalysing the removal of nucleotides from the ends of DNA is
a) endonuclease b) exonuclease c) DNA ligase d) Hind II
309. Thermal cycle takes place in which technique
a) Gel electrophoresis b) PCR- technique c) Centrifugation d) Southern blotting
310. Which of the following bonds are formed by action of DNA ligase?
a) Sugar-phosphate bond b) Phosphodiester bond c) Phosphate-phosphate bond
d) Both (1) & (2)
311. Some of the characteristics of Bt cotton are :
a) High yield and production of toxic protein crystals which kill dipteran pests
b) High yield and resistance to bollworms c) Long fibre and resistance to aphids
d) Medium yield, long fibre and resistance to beetle pests
312. PCR and Restriction Fragment Length Polymorphism are the methods for _____.
a) Study of enzymes b) Genetic transformation c) DNA sequencing
d) Genetic Fingerprinting
313. Match column I with column II with respect to the nomenclature of restriction enzyme EcoRI and select the correct answer from the given codes.
- | Column - I | Column -II |
|------------|----------------------------------|
| AE | i 1st in order of identification |
| Bo | ii Name of genus |
| CR | iii Name of species |
| DI | iv Name of strain |
- a) A-(iii), B-(i), C-(ii), D-(iv) b) A-(ii), B-(i), C-(iii), D-(iv) c) A-(i), B-(ii), C-(iii), D-(iv)
d) A-(ii), B-(iii), C-(iv), D-(i)
314. The genetically-modified (GM) brinjal in India has been developed for:
a) Enhancing mineral content b) Drought - resistance c) Insect - resistance
d) Enhancing shelf life
315. pBR- 322 which is frequently used as a vector for cloning gene is-
a) an original bacterial plasmid b) a modified bacterial plasmid c) a viral genome
d) a transposon
316. Which structure involved in genetic engineering:
a) Plastid b) Plasmid c) Codon d) None

317. Recombinant DNA is obtained by cleaving the pro - DNA by _____.
a) primase b) exonucleases c) ligase d) restriction endonuclease
318. Introduction of foreign genes for improving genotype is called
a) Biotechnology b) Tissue culture c) Genetic engineering d) Both (1) & (3)
319. In pBR322, tetracycline resistance gene (tet^R) has recognition site for which of the following restriction endonuclease?
a) HindIII b) BamHI c) EcoRI d) PstI
320. A researcher identifies a naturally occurring variant possessing characteristics of interest. This plant is selectively bred. This is an example of
a) Traditional plant breeding b) Transgenic technology c) Mutant selection
d) Cross breeding
321. Read the following statements and select the incorrect ones.
(i) When the transformed cells on agar plates containing ampicillin are spread, both transformed and untransformed cells will grow.
(ii) Restriction enzymes are used in isolation and separation of DNA from other macromolecules.
(iii) Downstream processing is one of the steps of rDNA technology.
(iv) Disarmed pathogen vectors are also used in transfer of rDNA into the host.
a) (ii) and (iii) b) (iii) and (iv) c) (i) and (iii) d) (i) and (ii)
322. The given figure is the diagrammatic representation of E.coli vector pBR 322.



- Which one of the given options correctly identifies its certain component(s)?
a) Ori - original restriction enzyme b) Rop - Reduced osmotic pressure
c) Hind III, EcoR I - selectable markers d) Amp^R, tet^R - antibiotic resistance genes
323. A piece of nucleic acid using to find out a gene, by forming hybrid with it, is called as :
a) Sticky end b) Blunt end c) c - DNA d) DNA probe
324. Introduction of food plants developed by genetic engineering is not desirable because _____.
a) economy of developing countries may suffer.
b) these products are less tasty as compared to the already existing products.
c) this method is costly.
d) there is danger of entry of viruses and toxins with introduced crop.
325. Restriction endonucleases are enzymes which _____.
a) make cuts at specific positions within the DNA molecule.
b) recognize a specific nucleotide sequence for binding of DNA ligase.
c) restrict the action of the enzyme DNA polymerase.
d) remove nucleotides from the ends of the DNA molecule.

326. DNA product is used for:
- a) DNA finger printing b) Detection of pathogenic bacteria
 - c) Medical genetics to find whether a person carries a particular gene or not
 - d) All the above
327. Characteristics of vector include all, except
- a) Presence of 'ori' b) Presence of antibiotic resistance gene as selection marker
 - c) Large size d) MCS
328. A genetically manipulated organism containing in its genome one or more inserted gene of another species is called :
- a) Transposon b) Gene expression c) Transgenic organism d) Retroposons
329. Stirred-tank bioreactors have been designed for:
- a) Purification of product b) Addition of preservatives to the product
 - c) Availability of oxygen throughout the process
 - d) Ensuring anaerobic conditions in the culture vessel
330. A gene whose expression helps to identify transformed cell is known as :
- a) Selectable marker b) Vector c) Plasmid d) Structural gene
331. Main objective of production/use of herbicide resistant GM crops is to:
- a) Eliminate weeds from the field without the use of herbicides
 - b) Encourage eco-friendly herbicides
 - c) Reduce herbicide accumulation in food articles for health safety
 - d) Eliminate weeds from the field without the use of manual labour
332. Enzyme 'Taq polymerase' used in PCR, has been isolated from bacterium:
- a) Agrobacterium tumefaciens b) Thermus aquaticus c) Streptomyces aureofaciens
 - d) Escherichia coli
333. **Assertion:** PCR primers must not have self complementary regions.
Reason: Self complementary regions result in hairpin structures adversely affecting the PCR.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false.
 - d) If assertion is false but reason is true.



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

BIOTECHNOLOGY AND ITS APPLICATIONS 1

Marks : 717

- Which part of the tobacco plant is infected by *Meloidogyne incognita*
a) Leaf b) Stem c) Root d) Flower
- Bt corn has been made resistant from corn borer disease by introduction of the gene
a) cryIAb b) cryIIAb c) amp^R d) Trp
- In Bt Cotton, the Bt toxin present in plant tissue as protoxin is converted into active toxin due to:
a) Alkaline PH of the insect gut b) Acidic pH of the insect gut
c) Action of gut microorganism d) Presence of conversion factors in insect gut
- C-peptide of human insulin is
a) a part of mature insulin molecule b) responsible for formation of disulphide bridges
c) removed during maturation of pro-insulin to insulin
d) responsible for its biological activity
- How many recombinant therapeutics worldwide have been approved for human use?
a) 13 b) 25 c) 30 d) 40
- Some of the steps involved in the production of humulin are given below. Arrange them in the correct sequence and select the correct option.
(i) Synthesis of gene (DNA) for human insulin artificially
(ii) Culturing recombinant *E. coli* in bioreactors.
(iii) Purification of humulin
(iv) Insertion of human insulin gene into plasmid.
(v) introduction of recombinant plasmid into *E. coli*
(vi) Extraction of recombinant gene product from *E. coli*.
a) (ii), (i), (iv), (iii), (v), (vi) b) (i), (iii), (v), (vi), (ii), (iv) c) (i), (iv), (v), (ii), (vi), (iii)
d) (iii), (v), (ii), (i), (vi), (iv)
- Silencing of a gene could be achieved through the use of
a) RNAi only b) antisense RNA only c) both RNAi and antisense RNA
d) none of the above
- 'Nif' gene for nitrogen fixation in cereal crops like wheat, jowar etc., is introduced by cloning
a) *Rhizobium meliloti* b) *Bacillus thuringiensis* c) *Rhizopus stolonifer*
d) *Agrobacterium tumefaciens*
- Which of the following risks are associated with genetically modified foods?

- a) Toxicity in human beings b) Allergic reactions in human beings
c) Antibiotic resistance in microorganisms present in alimentary canal d) All of these
10. Study the following statements regarding organic farming and select the correct ones.
(i) It utilises genetically modified crops like Bt cotton.
(ii) It uses only naturally produced inputs like compost and biofertilisers.
(iii) It does not use pesticides and urea.
(iv) It produces vegetables rich in vitamins and minerals.
a) (i) and (ii) b) (iii) and (iv) c) (ii) and (iii) d) (ii), (iii) and (iv)
11. An example of gene therapy is
a) production of injectible hepatitis B vaccine
b) production of vaccines in food crops like potatoes which can be eaten
c) introduction of gene for adenosine deaminase in persons suffering from SCID
d) production of test tube babies by artificial insemination and implantation of fertilised eggs
12. Pathophysiology is the
a) study of physiology of pathogen b) study of normal physiology of host
c) study of altered physiology of host d) none of the above
13. Which organism is held responsible for causing root-Knots in food and fibre crops especially tobacco?
a) *Caenorhabditis elegans* b) *Meloidogyne incognita* c) *Nicotiana glauca* d) *Ascaris*
14. Study the following statements and select the incorrect ones
(i) 'Bt' in 'Bt cotton' indicates that it is a genetically modified crop produced through biotechnology.
(ii) The anticoagulant 'hirudin' is being produced from transgenic *Brassica napus* seeds.
(iii) 'Flavr Savr' transgenic tomatoes remain fresh for a longer period than the normal tomato variety.
(iv) Golden rice is a transgenic variety of *Oryza sativa*, which is rich in β -carotene and helps to prevent night blindness.
a) (i) only b) (i) and (iv) c) (ii) and (iii) d) (i), (ii), (iii) and (iv)
15. Who is recognised as Father of Green Revolution?
a) Norman Ernest Borlaug b) Verghese Kurien c) Ernst Mayr d) Eli Lilly
16. Which of the following statements is incorrect about gene therapy in ADA deficiency?
a) Lymphocytes from patient's blood are taken out and cultured
b) A functional ADA-cDNA is introduced into these lymphocytes
c) Lymphocytes are then introduced in the body of patient
d) Patient does not require periodic infusion of genetically engineered lymphocyte
17. Tobacco plant resistant to a nematode have been developed by the introduction of DNA that produced in the host cells:
a) Both sense and anti-sense RNA b) A particular hormone c) An antifeedant
d) A toxic protein

18. Assertion: The first clinical gene for ADA therapy was given to cure SCID.
Reason: The normal gene was delivered into the patient's cells using retroviral vector.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
19. Which body of the Government of India regulates GM research and safety of introducing GM organisms for public services?
a) Bio-safety committee b) Indian council for Agriculture Research
c) Genetic engineering Approval Committee
d) Research Committee on Genetic Manipulation.
20. Which variety of rice was patented by a U.S. company even though the highest number of varieties of this rice are found in India?
a) Sharbati Sonora b) Co-667 c) Basmati d) Lerma Rojo
21. Early detection of a disease is possible by
a) PCR b) gene therapy c) recombinant DNA technology and ELISA d) both (a) and (c)
22. Assertion: Transgenic plants having virus coat protein gene, express resistance to that virus and other related varieties.
Reason: Coat protein gene interferes with uncoating of viruses inside the plant cells
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
23. The most common substrate used in distilleries for the production of ethanol is _____.
a) corn meal b) soya meal c) ground gram d) molasses
24. In RNAi, genes are silenced using
a) ssDNA b) dsDNA c) dsRNA d) ssRNA
25. Assertion: ELISA test is based on antigen-antibody interactions where a pathogen can be detected by the presence of antibodies (proteins, glycoproteins, etc.) on it.
Reason: The pathogen antibody to be identified is immobilised on the surface of specially constructed ELISA plates and is then tested.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
26. The process of RNA interference has been used in the development of plants resistant to _____.
a) nematodes b) fungi c) viruses d) insects
27. Which type of pH conditions are required for action by Bt toxin?
a) 8.6 b) 1 c) 7.0 d) 6.8
28. Consumption of which one of the following foods can prevent the kind of blindness associated with vitamin A deficiency?
a) Flavr Savr tomato b) Canola c) Golden rice d) Bt-Brinjal

29. Assertion: Plantibodies are animal antibodies produced in plants.
Reason: Plantibodies are just a theoretical concept.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
30. Use of bio-resources by multinational companies and other organisations without proper authorisation from the countries and people concerned without compensatory payment is termed as
a) resource partitioning b) biopiracy c) patenting d) biofortification
31. Assertion: USA's patent of brazzein is an example of biopiracy.
Reason: Brazzein a protein obtained from West African plant, *Pentadiplandra brazzeana* and the gene encoding it has been patented by USA.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
32. Though Green Revolution has been a resounding success in terms of agricultural production, yet it has failed in its overall social objectives because
a) it has not succeeded in making India totally and permanently self-sufficient in food
b) use of agrochemicals becomes very expensive for Indian farmers as well as these have harmful effects on environment
c) in regional terms, only Punjab and Haryana states, and the eastern plains of river Ganges in West Bengal state, showed reasonably good results, but results were less impressive in other parts of India
d) all of these
33. Which of the following genes were introduced in cotton to protect it from cotton bollworms?
a) CryAc and CryAb b) BtAc and BtAb c) CryIAc and CryIIAb d) Nif genes
34. GEAC stands for
a) Genome Engineering Action Committee b) Ground Environment Action Committee
c) Genetic Engineering Approval Committee
d) Genetic and Environment Approval committee
35. What triggers activation of protoxin to active Bt toxin of *Bacillus thuringiensis* in boll worm?
a) Moist surface of midgut b) Alkaline PH of gut c) Acidic PH of stomach
d) Body temperature
36. Match the organism with its use in biotechnology.

Column - I	Column -II
(a) <i>Bacillus Thuringiensis</i>	(i) Cloning vector
(b) <i>Thermus aquaticus</i>	(ii) Construction of first rDNA Molecule

(c) <i>Agrobacterium tumefaciens</i>	(iii) DNA polymerase
(d) <i>Salmonella typhimurium</i>	(iv) Cry proteins

Select the correct option from the following

- a) (iii) (ii) (iv) (i) b) (iii) (iv) (i) (ii) c) (ii) (iv) (iii) (i) d) (iv) (iii) (i) (ii)
37. Bt cotton variety that was developed by the introduction of toxin gene of *Bacillus thuringiensis* (Bt) is resistant to: _____.
a) Plant nematodes b) Insect predators c) Insect pests d) Fungal diseases
38. Molecular probes are used for many genetic disorders like
a) Duchenne muscular dystrophy b) cystic fibrosis c) Tay-Sachs disease d) all of these
39. Adenosine deaminase deficiency can be permanently cured by which of the following methods?
a) Bone marrow transplantation b) Enzyme replacement therapy
c) Gene therapy at early embryonic stages d) All of these
40. Animals that have had their DNA manipulated to possess and express a foreign gene are called
a) transgenic animals b) somatic hybrids c) somaclones d) super animals
41. Golden rice is yellow in colour due to the presence of
a) riboflavins b) β -carotene c) vitamin B₁ d) complex genetic material
42. Pollen tablets are available in the market for: _____.
a) In vitro fertilisation b) Breeding programmes c) Supplementing food
d) Ex-situ conservation
43. Assertion: Green revolution was comparatively less effective in developing world where farmers were dependent on conventional breeding.
Reason: In developing world, inability to buy expensive agro-chemicals forced farmers to rely on conventional breeding.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
44. Some of the characteristics of Bt cotton are: _____.
a) long fibre and resistance to aphids
b) medium yield, long fibre and resistance to beetle pests
c) high yield and production of toxic protein crystals which kill dipteran pests
d) high yield and resistance to bollworms
45. A transgenic food crop which may help in solving the problem of night blindness in developing countries is _____.
a) Flavr Savr tomatoes b) Starlink maize c) Bt Soybean d) Golden rice
46. 95% of the existing transgenic animals are
a) fish b) pigs c) sheep d) mice

47. Study the following steps which are followed during the process of gene therapy while treating a patient of SCID.
- (i) Retrovirus infects lymphocytes extracted from bone marrow of the patient and cultured.
 - (ii) Engineered cells are injected into patient's bone marrow.
 - (iii) Normal allele is inserted into a retrovirus.
 - (iv) Retrovirus makes a DNA copy of its RNA. This DNA carrying the normal allele gets inserted into the chromosome of the host cell.
- Arrange the above given steps in correct sequence and select the correct option.
- a) (iii), (i), (ii), (iv) b) (iii), (i), (iv), (ii) c) (iv), (ii), (iii), (i) d) (iv), (iii), (i), (ii)
48. Genetic engineering has been successfully used for producing _____.
a) animals like bulls for fatm work as they have super power.
b) transgenic mice for testing safety of polio vaccine before use in humans.
c) transgenic models for studying new treatments for certain cardiac diseases
d) transgenic cow - rosie which produces high fat milk for making ghee.
49. All are the biotechnological applications in order to increase food production except
a) apiculture b) agro-chemical based agriculture c) organic farming
d) genetically engineered crop-based agriculture
50. Assertion: Colon bacilli can be used to produce glycoproteins that can be used for hepatitis B treatment.
Reason: Hepatitis B is a viral disease and its spread in the body can be checked using interferons.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion
 - c) If assertion is true but reason is false d) If both assertion and reason are false
51. Study the following statements regarding Bt toxins produced by bacterium *Bacillus thuringiensis* and select the correct one.
- a)
Most strains of *Bacillus thuringiensis* produce proteins that kill certain insects such as lepidopterans, coleopterans and dipterans
 - b)
Bt toxin proteins do not kill the bacteria themselves because the toxin proteins occur in an inactive form called protoxins
 - c)
When an insect ingests the inactive Bt toxin, it is converted to an active form of toxin due to alkaline pH of the gut which solubilises the protein toxin crystals
 - d) All of these
52. X is the right granted by a government to an inventor to prevent others from commercial use of his invention. When 'X' are granted for biological entities and for products derived from them, these are called 'Y'.
Read the above paragraph and identify X and Y.

- a) X - patent, Y - biopatent b) X - piracy, Y - biopiracy c) X - patent, Y - biopiracy
d) X - piracy, Y - biopatent
53. 'Flavr Savr' variety of tomato which remains fresh for a longer period than normal tomato variety
a) has high amount of enzyme polygalacturonase
b) has reduced amount of enzyme polygalacturo-nase c) is a pest resistant variety
d) is rich in vitamin A and prevents night blindness
54. The site of production of ADA in the body is
a) erythrocytes b) lymphocytes c) blood plasma d) osteocytes
55. What causes the inactive form of Bt toxin i.e., protoxin to get converted into its active form in the body of an insect?
a) Temperature of the gut b) Enzymes present in the saliva c) Alkaline pH of the gut
d) There is no specific reason
56. A genetic disorder can be cured through
a) rDNA technology b) embryo transfer c) gene therapy d) all of these
57. Which step has been taken by Government of India to cater to the requirement of patent terms and other emergency provisions in this regard?
a) Biopiracy Act b) Indian Patents Bill c) ETI Act d) Negotiable instruments Act
58. Transgenic plants are the one _____.
a) generated by introducing foreign DNA into a cell and regenerating a plant from that cell.
b) produced after protoplast fusion in artificial medium.
c) grown in artificial medium after hybridisation in the field.
d) produced by a somatic embryo in artificial medium.
59. Assertion: Human insulin can be produced into bacterial cells using biotechnology.
Reason: To produce human insulin the A, Band C polypeptides of the human insulin are produced separately in the bacterial cells, extracted and combined by creating disulphide bonds.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
60. The first clinical gene therapy was given for treating:
a) Diabetes mellitus b) Chicken pox c) Rheumatoid arthritis
d) Adenosine deaminase deficiency
61. Match the following columns and select the correct option.

Column - I	Column - II
(a) Bt cotton	(i) Gene therapy
(b) Adenosine deaminase	(ii) Cellular defence deficiency
(c) RNAi	(iii) Detection of HIV infection
(d) PCR	(iv) Bacillus thuringiensis

Select the correct option.

- a) (ii) (iii) (iv) (i) b) (i) (ii) (iii) (iv) c) (iv) (i) (ii) (iii) d) (iii) (ii) (i) (iv)
62. The trigger for activation of toxin of *Bacillus thuringiensis* is
a) acidic pH of stomach b) high temperature c) alkaline pH of gut
d) mechanical action in the insect gut
63. A human protein which is being obtained from transgenic animals and is used to treat emphysema is
a) alpha-lactalbumin b) thyroxine c) α -1-antitrypsin d) insulin
64. Bt cotton is not
a) a GM plant b) insect resistant c) a bacterial gene expressing system
d) resistant to all pesticides
65. The silencing of mRNA has been used in producing transgenic plants resistant to :
a) Boll worms b) Nematodes c) White rusts d) Bacterial blights
66. Read the given statements and select the correct option.
Statement 1: PCR technique is helpful in detecting bacterial and viral diseases even when symptoms of the disease are not yet visible.
Statement 2: Very low concentrations of bacteria or viruses in human body can be detected by amplification of their nucleic acids using the PCR technique.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
67. There was great excitement around the world when the sheep 'Dolly' was cloned using a nucleus derived from an adult cell of its 'mother' which was then transplanted into an enucleated egg. There is also excitement when it is announced that genes causing human diseases, like muscular dystrophy, have been cloned. Which statement about these two examples of cloning is correct?
a) They both involve cutting a piece of DNA from the genome
b) One involves the cloning of a nucleus and the other is the cloning of a piece of DNA
c) They both produce products genetically identical to the original donor of cellular material
d) They raise no ethical questions
68. The two polypeptides of human insulin are linked together by :
a) Phosphodiester bond b) Covalent bond c) Disulphide bridges d) Hydrogen bonds
69. Read the given statements and select the correct option.
Statement 1: Transgenic mouse is termed as 'super mouse' because it is twice big in size than the normal mouse.
Statement 2 : In 'super mouse', the gene for human growth factor has been introduced and expressed
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect

- c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
70. The crops engineered for glyphosate are resistant and tolerant to _____.
a) Bacteria b) Insects c) Herbicides d) Fungi
71. Maximum number of existing transgenic animals is of : _____.
a) fish b) mice c) cow d) pig
72. Continuous addition of sugars in 'fed batch' fermentation is done to _____.
a) produce methane b) obtain antibiotics c) purify enzymes d) degrade sewage
73. RNA interference involves
a) synthesis of cDNA and RNA using reverse transcriptase
b) silencing of specific mRNA due to complementary RNA
c) interference of RNA in synthesis of DNA d) synthesis of mRNA from DNA
74. A probe which is a molecule used to locate specific sequences in a mixture of DNA or RNA molecules could be
a) a single stranded RNA b) a single stranded DNA c) either RNA or DNA
d) can be ssDNA but not ssRNA
75. Human insulin is being commercially produced from a transgenic species of
a) Mycobacterium b) Rhizobium c) Saccharomyces d) Escherichia
76. Which one of the following is now being commercially produced by biotechnological procedures?
a) Nicotine b) Morphine c) Quinine d) Insulin
77. Read the given statements and select the correct option.
Statement 1: The transgenic food may cause toxicity and produce allergy in human beings.
Statement 2: The bacteria present in alimentary canal of human beings may become resistant to the antibiotics by taking up the antibiotic resistant gene that is present in the GM food.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
78. For effective treatment of a disease:
a) early diagnosis is required but understanding of its pathophysiology is not required
b) early diagnosis is not required but understanding of its pathophysiology is required
c) early diagnosis and understanding of its pathophysiology is required
d) neither early diagnosis not understanding of its pathophysiology is required
79. Which of the following statements is not correct?
a) The functional insulin has A and B chains linked together by hydrogen bonds.
b) Genetically engineered insulin is produced in E-Coli.

- c) In man insulin is synthesised as proinsulin,
d) The proinsulin has an extra peptide called C - peptide
80. Which of the following statements is not correct?
- a)
Insulin used for diabetic patients was earlier extracted from pancreas of slaughtered cattle and pigs which was more efficient than the genetically engineered insulin.
- b)
PCR technique is applied to detect HIV in suspected AIDS patients and to detect mutations in genes in suspected cancer patients
- c)
Bone marrow transplantation requires periodic infusion of genetically engineered lymphocytes in ADA deficient patients
- d) Bioremediation is the one of the applications of biotechnology
81. Gene therapy can be referred to as
- a) pre-clinical testing for inherited diseases in newborns
b) treatment of diseases caused by genetic defect
c) genetic engineering using rDNA technology
d) cancer treatment using in vitro cultured stem cells
82. Match column I containing transgenic organisms with their specific characteristics in column II and select the correct option from the given codes.
- | Column I | Column II |
|----------------|------------------------------------|
| A. Golden rice | (i) Protein - enriched milk |
| B. Bt cotton | (ii) Increased shelf life |
| C. Flavr Savr | (iii) Enriched with vitamin A |
| D. Rosie cow | (iv) High yield and pest resistant |
- a) A-(iii), B-(iv), C-(ii), D-(i) b) A-(iii), B-(ii), C-(iv), D-(i) c) A-(ii), B-(iv), C-(iii), D-(i)
d) A-(i), B-(iv), C-(ii), D-(iii)
83. Which of the following companies started selling humulin in the year 1983?
- a) Eli Lilly b) Genetech c) GEAC d) None of these
84. The first clinical gene therapy was done for the treatment of
- a) AIDS b) cancer c) cystic fibrosis
d) SCID (Severe Combined Immuno Deficiency resulting from deficiency of ADA)
85. Golden rice is
- a) a variety of rice grown along the yellow river China
b) long stored rice having yellow colour tint c) a transgenic rice having gene for β -carotene
d) wild variety of rice with yellow coloured grains
86. Bacillus thuringiensis (Bt) strains have been used for designing novels ____.
- a) Biofertilisers b) Bio-metallurgical techniques c) Bio-mineralization processes
d) Bioinsecticidal plants

87. A new variety of rice was patented by a foreign company, though such varieties have been present in India for a long time. This is related to _____.
a) Lerma Rojo b) Sharbati Sonora c) Co - 667 d) Basmati
88. Which of the following is true for Golden rice?
a) It is pest resistant, with a gene from *Bacillus thuringiensis*.
b) It is drought tolerant, developed using *Agrobacterium* vector.
c) It has yellow grains, because of a gene introduced from a primitive variety of rice.
d) It is Vitamin A enriched, with a gene from daffodil
89. The transgenic animals are those which have _____.
a) foreign DNA in some of its cells. b) foreign DNA in all its cells
c) foreign RNA in all its cells d) DNA and RNA both in the cells
90. _____ is a single stranded DNA or RNA, tagged with a radioactive molecule and is used to detect mutated genes.
a) RNAi b) Probe c) Plasmid d) Primer
91. Technique used to detect the DNA in a clone is
a) polymerase chain reaction b) gel electrophoresis c) chromatography
d) autoradiography
92. Golden rice is a genetically modified crop plant where the incorporated gene is meant for biosynthesis of _____.
a) Vitamin C b) Omega 3 c) Vitamin A d) Vitamin B
93. Match column I with column II and select the correct option from the given codes.
- | Column I | Column II |
|----------------------------|-----------------------------|
| A. α -I-antitrypsin | (i) AIDS |
| B. Transposon | (ii) Gene therapy |
| C. ELISA | (iii) Emphysema |
| D. Retroviral vector | (iv) Mobile genetic element |
- a) A-(i), B-(iii), C-(ii), D-(iv) b) A-(iii), B-(iv), C-(i), D-(ii) c) A-(i), B-(ii), C-(iii), D-(iv)
d) A-(iii), B-(i), C-(ii), D-(iv)
94. Choose the correct option regarding retrovirus.
a) An RNA virus that can synthesise DNA during infection
b) A DNA virus that can synthesise RNA during infection c) A ssDNA virus
d) A dsRNA virus
95. Assertion: Complementary pairing between nucleotides is used to diagnose presence of a specific DNA segment in a mixture.
Reason: DNA probes having radioactive isotopes help to detect DNA by autoradiography.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
96. Assertion: The RNAi can be introduced in an organism by insertion of gene encoding complementary RNA only.
Reason: There are no methods by which in vitro synthesised complementary RNA can be

inserted in an organism to induce RNAi (RNA interference).

- a) If both assertion and reason are true and reason is the correct explanation of assertion
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion
 - c) If assertion is true but reason is false d) If both assertion and reason are false
97. Which of the following agricultural challenges cannot be solved with transgenic techniques?
- a) Crops are damaged by frost or drought b) Crops are damaged by insect pests
 - c) Public concern about safety of synthetic pesticides
 - d) Public preference for organic vegetables
98. Bt toxins are
- a) intracellular lipids b) intracellular crystalline proteins c) extracellular crystalline proteins
 - d) intracellular polysaccharides
99. Potential pathogens for bioweapons are
- a) *Bacillus anthracis* b) *Yersinia pestis* c) *Vibrio cholerae* d) all of these
100. You discovered a novel eukaryotic organism that glows in the dark. You believe this trait is due to a single gene, and you wish to clone the gene. Which of the following strategies is most likely to be successful?
- a)
Isolate the genomic DNA from the organism, digest with a restriction endonuclease, insert into a plasmid vector and transform into bacteria. Screen colonies for the ability to glow in the dark
 - b)
Isolate the genomic DNA from the organism, digest with a restriction endonuclease, insert into a plasmid vector and transform into eukaryotic cells such as yeast. Screen colonies for the ability to glow in the dark
 - c)
Isolate mRNA from the organism, reverse transcribe and generate cDNA, insert into a plasmid vector and transform into bacteria. Screen colonies for the ability to glow in the dark
 - d)
Isolate mRNA from the organism, reverse transcribe and generate cDNA, insert into a plasmid vector and transform into eukaryotic cells such as yeast. Screen colonies for the ability to glow in the dark
101. Rules of conduct that may be used to regulate our activities in relation to the biological world is called
- a) bioethics b) biowar c) biopatent d) biopiracy
102. Main objective of production/use of herbicide-resistant GM crops is to _____.
- a) eliminate weeds from the field without the use of manual labour.
 - b) eliminate weeds from the field without the use of herbicides.
 - c) encourage eco-friendly herbicides.
 - d) reduce herbicide accumulation in food articles for health safety.

103. A monopoly granted to a person who has either invented a new and useful article, made improvement in an existing article or invented a new process of making an article is called
a) biopiracy b) bioethics c) patent d) genetic modification
104. Which of the following Bt crops is being grown in India by the farmers?
a) Cotton b) Brinjal c) Soyabean d) Maize
105. Which of the following has been covered under the broad patent category?
a) Triticum b) Oryza c) Pisum sativum d) Brassica
106. Giant mouse has been produced through
a) gene transfer b) gene differentiation c) tissue culture d) all of these
107. What is true about Bt toxin?
a) Bt protein exists as active toxin in the Bacillus.
b)
The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication.
c) The concerned Bacillus has antitoxins.
d) The inactive protoxin gets converted into active form in the insect gut.
108. What does 'Bt' in Bt toxin represent?
a) Bioterrorism b) Bleeding toxin c) Bacillus Thuringiensis d) Blue tooth toxin
109. Which kind of therapy was given in 1990 to a four year old girl with Adenosine Deaminase deficiency (ADA)?
a) Gene therapy b) Chemo therapy c) Immunotherapy d) Radiation therapy
110. Which of the following statements is/are correct?
a)
The current interest in the manipulation of microbes, plants and animals has raised serious ethical issues
b)
One possible risk of genetic engineering is the accidental production of antibiotic resistant microorganisms
c)
Although risks are possible, genetic engineering offers more of a contribution to human welfare than threats
d) All of these
111. Bt toxin kills insects by
a) inhibiting protein synthesis b) generating excessive heat
c) creating pores in the midgut epithelial cells, leading to cell swelling and lysis
d) obstructing a biosynthetic pathway
112. Which of the following is not a benefit of transgenic animals?
a) Investigation of new treatments for diseases b) Early detection of diseases
c) Testing the safety of vaccines d) To produce useful biological products

113. Which of the following features of genetic code does allow bacteria to produce human insulin by recombinant DNA technology?
- a) Genetic code is redundant b) Genetic code is nearly universal
c) Genetic code is specific d) Genetic code is not ambiguous
114. Agrochemical based agriculture includes
- a) fertilisers and pesticides b) genetically modified crops c) RNA interference
d) all of these
115. Which of the following statements are correct regarding the process of RNA interference?
- (i) This is used to prevent the infestation of protozoans.
(ii) It takes place in some eukaryotic and all prokaryotic organisms as a method of cellular defense.
(iii) The method involves silencing of a specific mRNA due to a complementary dsRNA molecule.
(iv) It is a novel strategy to produce pest-resistant plants.
- a) (iii) and (iv) b) (i) and (iii) c) (i) and (ii) d) (ii), (iii) and (iv)
116. 'Golden rice' developed through transgene approach is enriched with
- a) high lysine content b) high methionine content c) high glutenin content
d) high vitamin A content
117. Name the scientists associated with development of Golden Rice
- a) Ingo Potrykus and Peter Beyer b) Milstein and Kohler
c) Stanley Miller and Harold Urey d) Stanley Cohen and Herbert Boyer
118. Which of the following statements regarding the structure of proinsulin and mature insulin are not correct?
- (i) Proinsulin is made up of three polypeptide chains- A, B and C.
(ii) C - polypeptide chain with 33 amino acids is removed prior to insulin formation.
(iii) Mature insulin is made up of 51 amino acids arranged in two polypeptide chains- A and B.
(iv) Polypeptide chain A has 30 amino acids and polypeptide chain B has 21 amino acids.
(v) Polypeptide chains A and B are interconnected by only one S - S linkage
- a) (i) and (ii) b) (iii) and (iv) c) (iv) and (v) d) (iii), (iv) and (v)
119. Assertion: Organisations like GEAC are necessary to monitor GM researches and to test the safety of introducing GM organisms for public services.
Reason: GM researches can have unpredictable results which even can be disastrous when genetically modified organisms are introduced into the ecosystem.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
120. What might be an advantage of beginning gene therapy prior to birth?
- a) This would give the body plenty of time to utilise the new genes
b) The body would not reject it as it has not yet recognised 'self'.

- c) The cells being extremely young, are more receptive of gene therapy
d) There probably is not any advantage
121. Which of the following statements regarding gene therapy is/are correct?
- a)
it is an application of biotechnology, in which a defective gene is manipulated by introduction of a normal, healthy and functional gene
- b)
The genetic disorders that are being investigated for gene therapy, range from sickle-cell anaemia to severe combined immuno-deficiency (SCID)
- c)
The first clinical gene therapy was given in 1990 to a 4-year old girl with adenosine deaminase (ADA) deficiency
- d) All of these
122. Select the incorrect matched pair.
- a) Monoclonal antibodies - Hybridomas b) PCR - Phenylketonuria
c) Bioweapons - Bacillus anthracis d) Tracy - First transgenic animal for food production
123. ADA is an enzyme which is deficient in a genetic disorder SCID. What is the full form of ADA?
- a) Adenosine deoxyaminase b) Adenosine deaminase c) Aspartate deaminase
d) Arginine deaminase
124. The genetically-modified (GM) brinjal in India has been developed for _____.
a) insect-resistance b) enhancing shelf life c) enhancing tmineral content
d) drought-resistance
125. Assertion: Biotechnology produces transgenic microorganisms that function as microfactories for proteins.
Reason: Transgenic microorganisms can be developed to produce proteins of human use like insulin.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
126. Bacillus thuringiensis forms protein crystals which contain insecticidal protein. This protein:
a) Binds with epithelial cells of midgut of the insect pest ultimately killing it
b) Is coded by several genes including the gene cry
c) Is activated by acid pH of the foregut of the insect pest
d) Does not kill the carrier bacterium, which is itself resistance to its toxin
127. Which statement about genetically modified (GM) food is false?

- a)
Scientists have used genetic modification, in various forms, as a mean of improving crop yields, crop quality, and pest resistance for many years
- b)
Genetic modification includes products made by artificial mutagenesis and by non-natural crosses between unrelated species
- c)
A major difficulty in labelling foods as 'GM-free' is that it is virtually impossible to measure genetically modified DNA or protein molecules in most food made from GM crops
- d)
The recent decision by McCain Foods to stop processing GM potatoes means that they will eventually use less pesticides to produce the potatoes that are required to make fries
128. What is true for monoclonal antibodies?
- a) These antibodies obtained from one parent and for one antigen.
b) These antibodies obtained from parent and for two antigens.
c) These antibodies obtained from one parent and for many antigens.
d) These antibodies obtained from many parents and for many antigens.
129. Golden rice is a transgenic crop of the future with the following improved trait: _____.
a) insect resistance b) high lysine (essential amino acid) content c) high protein content
d) high vitamin-A content
130. Select the correct options to fill up the blanks.
- (i) _____ enzyme is crucial for the immune system to function and its absence is caused by the deletion of a gene.
(ii) Insulin consists of _____ and _____ that are linked together by _____
(iii) Transgenic mice are being used to test the safety of the _____
(iv) _____ involves silencing of a specific mRNA due to a complementary dsRNA molecule that binds to and prevents translation of the mRNA.
- a)
(i) Adenosine deaminase (ii) A-chain, B-chain, disulphide bridges (iii) polio vaccine (iv) RNAi
- b)
(i) RNAi (ii) A-chain, B-chain, disulphide bridges (iii) adenosine deaminase (iv) polio vaccine
- c) (i) Adenosine deaminase (ii) A-chain, B-chain, hydrogen bonds (iii) polio vaccine (iv) RNAi
- d)
(i) RNAi (ii) A-chain, B-chain, non-covalent bridges (iii) polio vaccine (iv) adenosine deaminase
131. The name of Norman Borlaug is associated with: _____.
a) white revolution b) green revolution c) yellow revolution d) blue revolution
132. Which of the following is not a genetically modified organism (GMO)?
a) Golden rice b) Rosie c) Dogie d) Dolly
133. Which of the following statements is/are correct with regard to the disadvantages of GM crops?

- a) GM crops can affect human health by causing allergic reactions
- b)
- Transgenes in commercial crops can endanger native species e.g., the Bt toxin gene expressed in pollen might endanger pollinators like honeybees
- c) Production of GM crops causes damage to the natural environment and is always costly
- d) All of these
134. Cry endotoxins obtained from *Bacillus thuringiensis* are effective against _____.
a) mosquitoes b) flies c) nematodes d) bollworms
135. Which one of the following is not used as biofertiliser?
a) *Bacillus thuringiensis* b) *Anabaena* c) *Nostoc* d) *Rhizobium*
136. The organisation which makes decisions regarding the validity of GM research and the safety of introducing GM-organisms for public services is
a) Genetic Engineering Approval Committee b) Genome Environment Action Committee
c) Genetic Environment Approval Committee
d) Genetics and Ethical Issue Action Committee
137. Which of the following statements is correct regarding Genetic Engineering Approval committee (GEAC)?
a) It makes decision regarding the validity of GM research
b) It ensures the safety of introducing GM-organisms for public services
c)
Genetic modification of organisms can have unpredictable results when such organisms are introduced into the ecosystem. Therefore, the Indian government has set up organisation such as GEAC
d) All of these
138. NaCl is harmful to most crop plants. A scientist at the University of Toronto genetically modified a plant so that it could be grown in dry parts of the world where the available water has a high level of NaCl. This genetically modified plant accumulates NaCl in its vacuoles where it accumulates to abnormally high levels. Which feature would be observed in the genetically modified plant when compared to a non-modified plant?
a) The leaves in the modified plant are more yellow in colour
b) The modified plant has salt crystals on the surface of its leaves
c)
The cytosol (the material between the plasma membrane and the vacuole membrane, excluding the organelles) in the modified plant has a lower osmotic pressure
d) The cytosol in the modified plant has a higher osmotic pressure
139. First genetically modified plant commercially released in India is
a) golden rice b) Flavr Savr c) Bt brinjal d) Bt cotton
140. Given below are certain features of mouse. Read them and select why mouse is the most preferred animal for studies on gene transfer.
(i) Short oestrous cycle and gestation period

- (ii) Relatively short generation time
 - (iii) Convenient in vitro fertilisation
 - (iv) Production of several offspring per pregnancy.
 - a) (i) and (ii) only b) (i) only c) (i), (ii) and (iv) only d) (i), (ii), (iii) and (iv)
141. Given are names of some transgenic animals. Identify the name of transgenic sheep.
- a) Rosie b) Dogie c) Tracy d) ANDI
142. Which of the following is the nematode that attacks the roots of tobacco plants?
- a) *Agrobacterium tumefaciens* b) *Rhizobium leguminosarum* c) *Meloidogyne incognita* d) *Taenia solium*
143. Which of the following statements is not correct regarding the genetic modification of crops?
- a) It makes crops more tolerant to abiotic stresses
 - b) It results in decreased efficiency of mineral usage by plants
 - c) It helps to reduce post harvest losses d) It enhances the nutritional value of food
144. Bacteria genetically engineered to express a gene from a plant will:
- a) synthesise a protein with the same sequence of amino acids as in the plant and, therefore, the protein will have the same structure and function as in the plant
 - b) synthesise a protein with essentially the same sequence of amino acids as in the plant with differences relating to different codon Wobble rules between prokaryotes and eukaryotes
 - c) not be able to synthesise a protein due to the presence of exon splicing sequences in the DNA sequence from the plant
 - d) not be able to synthesise a protein because translation is coupled with transcription and post-transcriptional processing does not occur in it
145. Bt toxin gene has been cloned from the bacteria and expressed in plants to provide resistance to insects without the need for insecticides. Examples of such plants are
- a) cotton and corn b) rice and potato c) tomato and soybean d) all of these
146. Assertion: 'Cry' proteins are named so because they are crystal proteins.
Reason: 'Cry' proteins are solubilised in acidic environment of insect midgut and then release toxic core fragments after proteolytic action.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
 - b) If both assertion and reason are true but reason is not the correct explanation of assertion
 - c) If assertion is true but reason is false d) If both assertion and reason are false
147. Bacterial artificial chromosomes (BACs), cosmids, phages, plasmids and yeast artificial chromosomes (YACs) are all commonly used cloning vectors that differ in their cloning capacities, with a range from approximately 100 bp to 1000 kb. Which of the following is the correct order for these vectors in terms of increasing cloning capacity?

- a) BAC, cosmid, phage, plasmid, YAC b) YAC, BAC, cosmid, phage, plasmid
c) Plasmid, phage, cosmid, BAC YAC d) Plasmid, cosmid, phage, BAC YAC

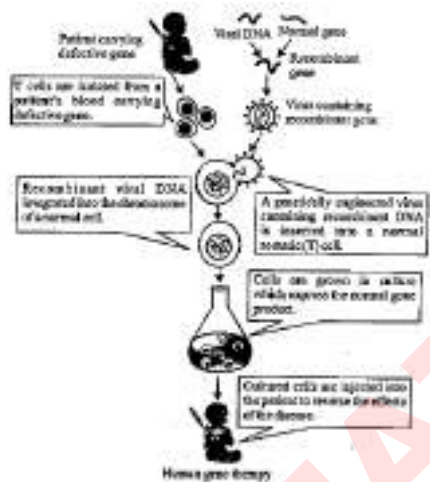
148. Hirudin is

- a) a protein produced by *Hordeum vulgare*, which is rich in lysine
b) a toxic molecule isolated from *Gossypium hirsutum*, which reduces human fertility
c) a protein produced from transgenic *Brassica napus* which prevents blood clotting
d) an antibiotic produced by a genetically engineered bacterium *Escherichia coli*

149. α -1 antitrypsin is

- a) an antacid b) an enzyme c) used to treat arthritis d) used to treat emphysema

150. Figure given below depict the procedure for gene therapy. Pick up the disorders for which this technique has been applied successfully.



- a) Adenosine Deaminase (ADA) Deficiency b) AIDS c) Myasthenia gravis
d) Both (a) and (c)

151. The transgenic plant 'Flavr Savr' tomato carries an artificial gene for

- a) delayed ripening process b) longer shelf life c) enhanced flavour d) all of these

152. Select the correct statement regarding an improved variety of transgenic basmati rice i.e., golden rice

- a) It does not require the use of chemical fertilisers
b) It is completely resistant to all insect pests and diseases.
c) It gives high yield but no characteristic aroma
d) It gives high yield and is rich in vitamin A

153. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?

- a) X phage b) Ti plasmid c) Retrovirus d) PBR 322

154. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called:

- a) Biodegradation b) Biopiracy c) Bio-infringement d) Bioexploitation

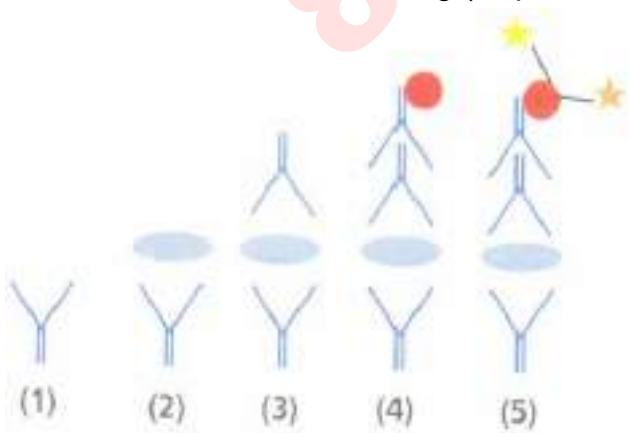
155. Which two of the above statements are correct?

- a) 2 and 4 b) 3 and 4 c) 1 and 3 d) 1 and 2

156. The first human hormone produced by recombinant DNA technology is _____.

- a) Insulin b) Estrogen c) Thyroxin d) Progesterone
157. What is the permanent cure of adenosine deaminase (ADA) deficiency in children?
- a) Bone marrow transplantation
- b) Enzyme replacement therapy in which functional ADA is given to patient by injection
- c) Infusion of genetically engineered lymphocytes (in which functional ADA - cDNA is introduced) into the patient's blood
- d) Introduction of gene isolated from the bone marrow cells which produce ADA, into the cells of the patient at early embryonic stages
158. Bt toxin genes have been expressed in plants in order to provide resistance against
- (i) lepidopterans and fungi
- (ii) animals and bacteria
- (iii) bacteria and fungi
- (iv) coleopterans and dipterans
- (v) lepidopterans
- a) (ii) and (iii) b) (i), (ii) and (iv) c) (iii) and (v) d) (iv) and (v)
159. During the processing of proinsulin into the mature insulin
- a) C-peptide is added to proinsulin b) C-peptide is removed from proinsulin
- c) B-peptide is added to proinsulin d) B-peptide is removed from proinsulin
160. Which genes encode the protein to control bollworms infection in cotton plants?
- a) cry IIAb b) cry IAc c) Both (1) & (2) d) Cry IAb
161. Assertion: GM salmon was the first transgenic animal for performing vaccine safety tests.
Reason: For the production of GM salmon, genetically modified ova were fused with normal sperms of the same species.
- a) If both assertion and reason are true and reason is the correct explanation of assertion
- b) If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false d) If both assertion and reason are false
162. Biopiracy means
- a) use of biopatents b) thefts of plants and animals c) stealing of bioresources
- d) exploitation of bioresources without authentic permission
163. Transgenic animals are those which have:
- a) Foreign DNA in some of its cells b) Foreign DNA in all its cells
- c) Foreign RNA in all its cells d) DNA and RNA both in the cells
164. CryIIAb and cryIAb produce toxins that control
- a) cotton bollworms and corn borer respectively
- b) corn borer and cotton bollworms respectively
- c) tobacco budworms and nematodes respectively
- d) nematodes and tobacco budworms respectively

165. Assertion: *Bacillus anthracis* exemplifies how biotechnology can be used for destructive processes.
Reason: The spores of anthrax bacterium were spread via letters in the form of powder.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
166. A doctor while operating on an HIV(+ve) patient accidentally cuts himself with a scalpel. Suspecting himself to have contracted the virus which test will he take to rule out/confirm his suspicion?
a) PCR b) Routine urine examination c) TLC d) DLC
167. Read the given statements and select the correct option.
Statement 1: GMO tomato 'Flavr Savr' has increased shelf life and better nutrient quality.
Statement 2: This is achieved by reducing the amount of cell wall degrading enzyme 'polygalacturonase' responsible for fruit softening.
a) Statement 1 is incorrect but statement 2 is correct
b) Both statements 1 and 2 are incorrect c) Both statements 1 and 2 are correct
d) Statement 1 is correct but statement 2 is incorrect
168. Read the following statements regarding ELISA and select the incorrect one.
a) It is used for the early diagnosis of diseases
b) It is based on the principle of antigen-antibody interaction
c) Infection by pathogen can be detected by the presence of antigens like proteins and glycoproteins
d) None of these
169. Which of the following types of ELISA contain the following steps?
Antigen binding, Blocking, Primary antibody, Secondary antibody, Enzyme-linked antibody, Substrate, Colorimetric reading (Represented in diagram).



- a) Direct ELISA b) Indirect ELISA c) Competitive ELISA d) Sandwich ELISA
170. Which Indian plants have either been patented or attempts have been made to patent them by western nations for their commercial use?
a) Basmati rice b) Turmeric c) Neem d) All of these have been targeted

171. Bt toxin protein crystals present in bacterium *Bacillus thuringiensis*, do not kill the bacteria themselves because
a) bacteria are resistant to the toxin b) toxins occur as inactive protoxins in bacteria
c) bacteria enclose toxins in a special sac d) none of these
172. Second generation vaccines are prepared by recombinant DNA technology. Which out of the following are the examples of such vaccines?
a) Hepatitis B virus vaccine b) Herpes virus vaccine c) Salk's polio vaccine
d) Both (a) and (b)
173. Read the given statements and select the correct option.
Statement 1: Foods derived from transgenic crops are called as GM foods.
Statement 2: Health and food safety concerns have been raised to ensure the safety of GM foods.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
174. The Bt toxin is not toxic to human beings because
a) the pro Bt toxin activation requires temperature above human body temperature
b) the Bt toxin recognises only insect -specific targets
c) the pro Bt toxin activation requires pH lower than that present in human stomach
d) conversion of pro Bt toxin to Bt toxin takes place in highly alkaline conditions
175. A protoxin is
a) a primitive toxin b) a denatured toxin c) toxin produced by protozoa d) inactive toxin
176. Biopatents are
(i) right to use invention
(ii) right to use biological entities
(iii) right to use products
(iv) right to use process
a) (i) and (ii) b) (ii) only c) (i), (ii) and (iv) d) (i), (ii), (iii) and (iv)
177. What is ANDI?
a) Transgenic cow b) Transgenic dog c) Transgenic sheep d) Transgenic monkey
178. Maximum application of animal cell culture technology today is in the production of _____.
a) edible proteins b) insulin c) interferons d) vaccines
179. How many recombinant therapeutics are being marketed in India?
a) 8 b) 12 c) 15 d) 30
180. The bacterium *Bacillus thuringiensis* is widely used in contemporary biology as _____.
a) insecticide b) agent for production of dairy products c) source of industrial enzyme
d) indicator of water Pollution



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Time : 1 Mins

ORGANISMS AND APPLICATIONS 1

Marks : 1337

1. The semilog of per minute growing bacteria is plotted against time. What will be the shape of graph?
a) Sigmoid b) Hyperbolic c) Ascending straight line d) Descending straight line
2. In which one of the following is nitrogen not a constituent?
a) Pepsin b) Idioblast c) Bacteriochlorophyll d) Invertase
3. The key elements that determine differences in environmental conditions of different habitats include
a) temperature b) light c) soil d) all of these.
4. Which of the following is an important adaptation of animals to the cold climate?
a) Thin layer of body fat b) Aestivation c) Increased tendency to shiver
d) Reduced surface area to volume ratio
5. Ozone layer of upper atmosphere is being destroyed by:
a) Sulphurdioxide b) Carbondioxide c) Chlorofluorocarbon d) Smog
6. Assertion: At high altitude a person, from plain areas, may experience altitude sickness.
Reason: At high altitudes atmospheric pressure is generally high leading to symptoms like nausea, fatigue, etc.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
7. Consider the following four statements about certain desert animals such as kangaroo rat:
(i) They have dark colour and high rate of reproduction and excrete solid urine
(ii) They do not drink water, breath at a low rate to conserve water and have their body covered with thick hair.
(iii) They feed on dry seeds and do not require drinking water
(iv) The excrete very concentrated urine and do not use water to regulate body temperature
Which two of the above statements for such animals are true?
a) (i) and (ii) b) (iii) and (iv) c) (ii) and (iii) d) (iii) and (i)
8. Which of the following is an advantage of predation?
a) It serves as conduits for energy transfer across trophic levels.
b) It keeps population of organisms of lower trophic level under control

- c)
Predators help in maintaining species diversity in a community, by reducing the intensity of competition among competing prey species.
- d) All of these
9. Several plant and animal species present together at a place constitute a
a) genus b) population c) biome d) community
10. Which of the following is not an attribute of a population?
a) Mortality b) Species interaction c) Sexratio d) Natality
11. The two climatic factors which largely determine the vegetation and soil types are
a) Temperature and precipitation b) Temperature and light c) Light and precipitation
d) Light and weather
12. In an ecosystem:
a) Primary producers are more than primary consumers
b) Primary consumers are large than primary producers
c) Secondary consumers are larger than primary producers
d) Primary consumers are least depend on primary producers
13. Lichens in a habitat indicates -
a) Zinc in soil b) Copper in soil c) Carbon monoxide in air d) Lack of air pollution
14. Which of the following exhibits mutualism?
a) Mycorrhizae living on the roots of higher plants b) Wasps pollinating fig inflorescence.
c) Sea anemone often found on the shell of hermit crab d) All of these
15. Cause of mimicry is _____.
a) concealment b) attack (offence) c) protection (defence) d) both (b) and (c)
16. Which is not true for J-shaped growth curve?
a) Exponential phase is prolonged b) Population never grows beyond carrying capacity
c) Population crash occurs d) Population seldom reaches equilibrium
17. Species interaction with negative influence on both is referred to as:
a) amensalism b) mutualism c) commensalism d) competition
18. An animal that can survive at 10°C and 40°C both, can be placed under the category of
a) conformers b) regulators c) migratory organisms d) modifiers
19. Ecological niche is
a) the surface area of the ocean b) an ecologically adapted zone
c) the physical position and functional role of a species within the community
d) formed of all plants and animals living at the bottom of a lake.
20. Which of the following pair is correctly matched?
a) Uricotelism - Aquatic habitat b) Parasitism - Intra-specific relationship
c) Excessive perspiration - Xeric adaptation d) Streamlined body - Aquatic adaptation
21. Carbon cycle includes (the following is a logical sequence) -

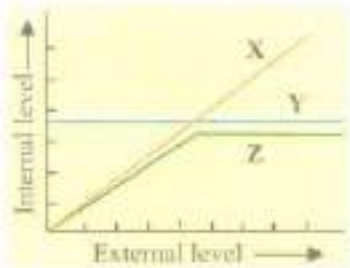
- a) Producer - consumer - decomposer b) Decomposer - consumer - producer
c) Producer - decomposer - consumer d) Consumer - producer - decomposer
22. Water holding capacity of the soil depends upon
a) chemical composition of soil b) particle size of soil c) aggregation of soil particles
d) all of these.
23. Natality refers to:
a) Number of individuals leaving the habitat b) Birth rate c) Death rate
d) Number of individuals entering a habitat
24. The maximum possible number of individuals that a habitat can support is called its
a) fecundity b) surviving ability c) carrying capacity d) biotic potential.
25. In plant succession last community is called:
a) Ecotone b) Climax community c) Serial community d) Ecosystem
26. Match the following given population interactions
- | | |
|---------|-------------------|
| (a) +/+ | (i) Predation |
| (b) -/- | (ii) Ammensalism |
| (c) +/- | (iii) Competition |
| (d) -/0 | (iv) Mutualism |
- a) (a) - iii, (b) - ii, (c) - i, (d) - iv b) (a) - iv, (b) - iii, (c) - ii, (d) - i
c) (a) - iii, (b) - i, (c) - iv, (d) - ii d) (a) - iv, (b) - iii, (c) - i, (d) - ii
27. Niche overlap indicates _____.
a) two different parasites on the same host.
b) sharing of one or more resources between the two species.
c) mutualism between two species. d) active cooperation between two species.
28. Main air pollutant among the following is -
a) CO b) CO₂ c) N₂ d) Sulphur
29. Which of the following would necessarily decrease the density of a population in a given habitat?
a) Natality > mortality b) Immigration > emigration c) Mortality and emigration
d) Natality and immigration
30. The branch of science which studies the interactions among organisms and between organisms and physical environment is called as
a) epidemiology b) ecology c) ethology d) etiology
31. The community which starts succession at a place is termed
a) Climax community b) Serial community c) Pioneer community d) Primary community
32. Ecosystem may be defined as -
a) A localized association of several plants and animals
b)
Different communities of plants, animals and microbes together with their physico-chemical environment.

- c) Different communities of plants microbes plus their physico - chemical environment
- d) None of the above

33. Adaptation may be

- a) behavioural b) morphological c) physinlogical d) all of these.

34. The given graph represents how three different living organisms (X, Y and Z) cope with the external environmental conditions. Study the graph and select the correct option regarding X, Y and Z.



- a) X could be a mammal b) Y could be a bird c) Z could be a mammal
- d) X could be a bird

35. The Quercus species are dominant component in.

- a) Alpine forests b) Scrub forests c) Temperate forests d) Tropical rain forests

36. Certain characteristic demographic features of developing countries are _____.

- a) high fertility, low or rapidly falling mortality rate, rapid population growth and a very young age distribution.
- b) high fertility, high density, rapidly rising mortality rate and a very young age distribution.
- c) high infant mortality, low fertility, uneven population growth and very young age distribution.
- d) high mortality, high density, uneven population growth and a very old age distribution.

37. In a forest ecosystem green plants are -

- a) Primary producers b) Consumers c) Primary consumers d) Decomposers

38. Organisms may avoid stressful conditions by suspending their activities for sometime. If they do it to avoid high temperature it is called _____ and if they do it to avoid low temperature then it is called

- a) aestivation, migration b) migration, hibernation c) aestivation, hibernation
- d) hibernation, aestivation

39. In an ecosystem the function of the producers is to

- a) Convert organic compounds into inorganic compounds
- b) Trap solar energy and convert it into chemical energy c) Utilize chemical energy
- d) Release energy

40. Which of the following is not an example of using relative density to measure population density in a certain area?

- a) Counting pugmarks of tigers to find population density of tigers in a forest.
- b) Counting the number of fishes caught in a trap to find population density of fishes in a lake.

c)

Measuring biomass of bacterial culture to find out population density of bacteria in a petri dish.

d)

Measuring biomass of phytoplanktons in 1 cc water to find out population density of phytoplanktons in a lake.

41. The tiger counting in our national parks and tiger reserves is often based on

a) Pug marks b) Manual counting c) Fecal plates d) Both 1 and 3

42. Basic unit of ecological hierarchy is

a) population b) community c) ecosystem d) individual

43. In which one of the following habitats does the diurnal temperature of soil surface vary most?

a) Shrub land b) Forest c) Desert d) Grassland

44. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Ladybird beetles feeding on insects	(i) Mutualism
B. Barnacles growing on the back of a whale	(ii) Predation
C. Wasp pollinating the fig inflorescence	(iii) Competition
D. Lice living on skin of humans	(iv) Commensalism
	(v) Parasitism

a) A-(ii), B-(iv), C-(i), D-(v) b) A-(iv), B-(ii), C-(v), D-(i) c) A-(ii), B-(i), C-(v), D-(iv)

d) A-(iii), B-(ii), C-(i), D-(iv)

45. Assertion : A population growing in a habitat with limited resources shows initially a lag phase, followed by phases of acceleration and deceleration and finally an asymptote, when the population density reaches the carrying capacity.

Reason : In Verhulst-Pearl Logistic growth, plot of N (population density) at time (t) results in a sigmoid curve.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

46. When we are in a hot room, we sweat profusely. It is a _____ means of maintaining homeostasis.

a) morphological b) physiological c) behavioural d) none of these

47. Which of the following factors influence population density under normal conditions?

a) Deaths b) Immigration c) Emigration d) Both (a) and (c)

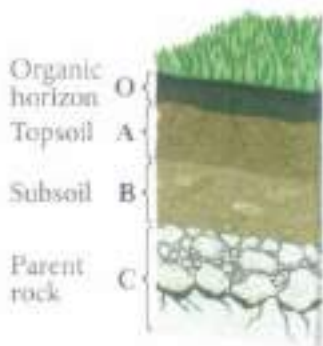
48. If the stressful external conditions are localised or remain only for a short duration, the organisms has not which alternative

a) Migration b) Dormancy c) Hibernation d) Homeostasis

49. Animals that can tolerate a narrow range of salinity are _____.

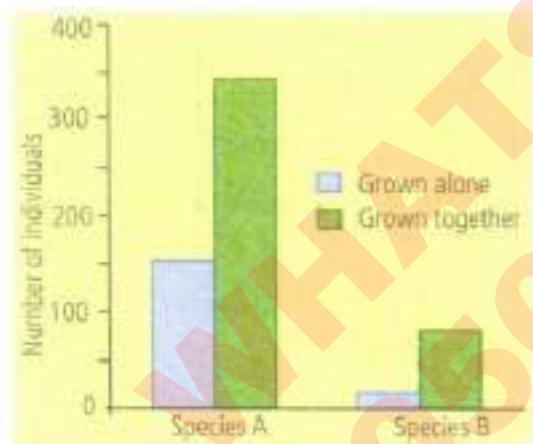
a) stenohaline b) euryhaline c) anadromous d) catadromous

50. The maximum energy is stored at which of the following trophic level in any ecosystem -
a) Producers b) Herbivores c) Carnivores d) Top carnivores
51. Trophic levels are formed by -
a) Only plants b) Only carnivores c) Only animals d) Organisms linked in food chain
52. In a population, unrestricted reproductive capacity is called as _____.
a) biotic potential b) fertility c) carrying capacity d) birth rate
53. Leaching is one of the important step of decomposition. During leaching, which of the following nutrient go down into the soil horizon?
a) Water soluble inorganic substance b) Water insoluble inorganic substances
c) Water soluble organic substance
d) Both water soluble organic substances and inorganic sustances
54. Given figure represents the soil profile, showing different layers/ horizons of soil. Which of the following statements regarding the soil profile are not true?



- (i) Maximum roots of plants are found in horizon A.
(ii) Maximum nutrients are present in horizon B.
(iii) Horizon B contains partly weathered rocks.
(iv) Horizon e contains roots of the plants and mineral salts.
a) (i) and (ii) b) (i) and (iii) c) (ii) and (iv) d) (i), (ii) and (iii)
55. Which one of the following statements is correct for secondary succession?
a) It begins on a bare rock. b) It occurs on a deforested site.
c) It follows primary succession.
d) It is similar to primary succession except that it has a relatively fast pace.
56. It can be said that some animals in their evolutionary development preferred to be conformers than regulators.
Which of the following can be the best suited reason for it?
a)
The metabolic reactions of these organisms can occur at a very wide range of temperature.
b) Maintaining homeostasis is an energetically expensive process.
c) The enzymes of these organisms are functional at high-temperatures.
d) Both (b) and (c)
57. Which of the following statements is/are correct?
a) Two species may not live in the same habitat
b) The more dissimilar the niches of two species, the stronger is competition between them.

- c) No two species can occupy exactly the same niche in the same geographical area.
d) All of these
58. What is the best pH of the soil for cultivation of plants :-
a) 3.4 - 5.4 b) 6.5 - 7.5 c) 4.5 - 8.5 d) 5.5 - 6.5
59. The science dealing with soil is called -
a) Pedology b) Acarology c) Geology d) Palaeontology
60. Most successful parasites are those which do not
a) Grow free b) Kill their host c) Reproduce sexually d) Survive in soil
61. A high density of elephant population in an area can result in _____.
a) intraspecific competition b) inter specific competition c) predation on one another
d) mutualism.
62. Two insect species were used in a laboratory experiment. For one treatment, both species were grown by themselves (in separate chambers) on a suitable food source. For the second treatment, the two species were grown together (in the same chamber) on the same type and amount of food as in the first treatment. The given figure shows the ' results (the number of individuals of each species in the two treatments) at the end of the experiment. Based on these results the two species should be classified as



- a) competitors b) mutualists c) predators or pathogens d) commensalists
63. Which of the following options is correct?

a)

Stenothermal organism	Eurythermal organism
Frog	Lizard

b)

Stenothermal organism	Eurythermal organism
Frog	Man

c)

Stenothermal organism	Eurythermal organism
Man	Lizard

d)

Stenothermal organism	Eurythermal organism
Polar bear	Coconut tree

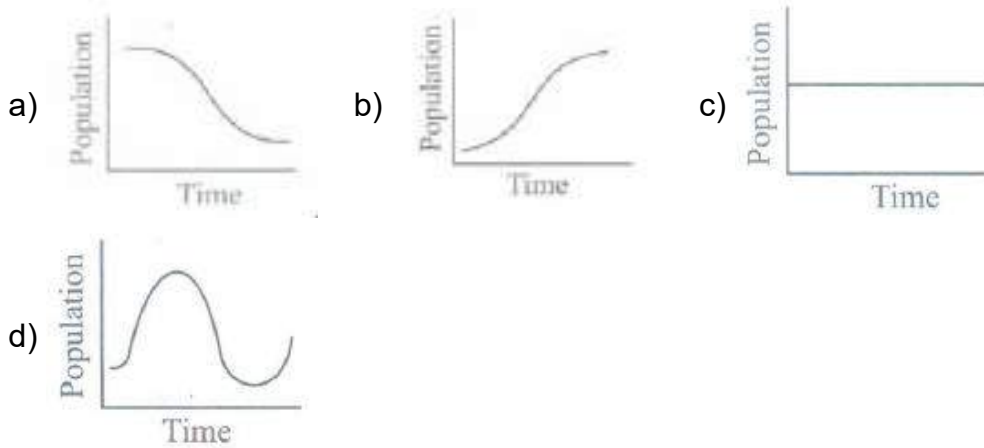
64. Refer to the given table that summarises the interactions between two organisms (organism 1 and organism 2). Identify the types of interaction (A, B and C) and select the correct answer.

Effects on organisms	Effects on Organism 2			
		Benefit	Harm	No Effect
	Benefit	Mutualism	Predation	B
	Harm	A	Competition	Amensalism
	No Effect	Commensalism	C	-

- (i) A can be either predation or parasitism.
 (ii) B can be either commensalism or amensalism.
 (iii) C can be amensalism.
 (iv) A can be amensalism
 a) (i) and (iii) b) (i) and (ii) c) (ii) and (iii) d) (iii) and (iv)
65. Ability of an environment to support a population is called its
 a) Biotic potential b) Purifying capacity c) Carrying capacity
 d) Environmental resistance
66. Which one is omnivorous -
 a) Frog b) Lion c) Deer d) Man
67. Biosphere is
 a) a component in the ecosystem b) composed of the plants present in the soil
 c) life in the outer space
 d)
 composed of all living organisms present on earth which interact with the physical environment.
68. Major pollutant in Jet plane emission is -
 a) SO_2 b) CFC c) CO d) CCl_4
69. The population of an insect species shows an explosive increase in numbers during rainy season followed by its disappearance at the end of the season. What does this show?
 a) The food plants mature and die at the end of the rainy season.
 b) Its population growth curve is of J-type.
 c) The population of its predators increases enormously.
 d) S-shaped or sigmoid growth of this insect.
70. Which pollutant exhibits biomagnification in food chain -
 a) DDT b) SO_2 c) CO d) PAN
71. Species restricted to a given area are called _____.
 a) sibling b) endemic c) sympatric d) allopatric
72. The factors which include the form, surface and behaviour of the earth with special reference to slopes, mountains, valleys etc. are called
 a) Edaphic factor b) Biotic factors c) Climatic factors d) Topographic factors
73. When peacock, eats snake which eats insects depends on green plants, the peacock is -


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- a) a primary consumers b) a primary decomposer c) a final decomposer of plants
d) the apex of the food pyramid
74. If a population of 50 What would be the percent growth or birth rate per individual per hour?
a) 50 per hour b) 200 per hour c) 5 per hour d) 100 per hour
75. Assuming that an animal generates heat at a rate proportional to its volume and can radiate heat at a rate proportional to its body surface area, which of the following would be best at maintaining its body temperature in a cold climate?
a) Mouse b) Rabbit c) Bear d) Fox
76. Desert plants are generally _____.
a) viviparous b) succulent c) herbaceous d) heterophyllous
77. If a population of 50 **Paramecium** present in a pool increases to 150 after an hour, what would be the growth rate of population?
a) 50 per hour b) 200 per hour c) 5 per hour d) 100 per hour
78. A protozoan reproduces by binary fission. What will be the number of protozoans in its population after six generations?
a) 128 b) 24 c) 64 d) 32
79. In a population per capita birth rate is 0.15 and per capita death rate is 0.08 during a unit time period. What is the value of r (intrinsic rate of natural increase) for the given population?
a) 0.23 b) 0.07 c) 0.05 d) 0.25
80. Competition for light, nutrients and space is most severe between _____.
a) closely related organisms growing in different niches
b) closely related organisms growing in the same area/ niche
c) distantly related organisms growing in the same habitat
d) distantly related organisms growing in different niches
81. Organisms that can tolerate a wide range of salt concentration are termed as
a) stenosaline b) stenohaline c) euryhaline d) eurysaline
82. A population with a larger proportion of older individuals than younger ones will likely to
a) grow larger and then decline b) continue to grow larger indefinitely c) decline
d) not experience a change in population size.
83. Which type of association is found in between entomophilous flowers and pollinating agent?
a) mutualism b) commensalism c) cooperation d) co-evolution
84. In a given population of 2000 individuals, 80 births and 125 deaths were reported over a given period of time. Which of the following graphs will correspond to it?



85. Which of the following options exemplifies a behavioural means of homeostasis?
a) A man sweating profusely in a hot room b) A rhino covering itself in mud to keep cool
c) A desert lizard basking in Sun to increase its body temperature d) Both (b) and (c)
86. The age structure of a population represents:
a) relative number of individuals at each age b) number of new births each year
c) number of individuals reaching puberty each year
d) relative number of deaths at each age
87. Increase of population under optimum condition is termed.
a) Reproductive ability b) Secondary production c) Biotic potential d) Biomass
88. In a life table, the number of individuals alive at the beginning of the 1st year to 2nd year interval is 800. During this interval, 200 individuals die. The death rate for this interval is
a) 0.25 b) 200 c) 800 d) 0.2
89. Assertion: Stomata generally open in light and close in dark.
Reason : Transpiration is enhanced by heating effect of light.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
90. An association of individuals of different species living in the same habitat and having functional interactions is
a) Population b) Ecological niche c) Pistia d) Pea
91. Shorter body extremities in animals living in colder climate is explained by
a) Allen's rule b) Bergman's rule c) Gloger's rule d) Jordan's rule
92. In the equation for S-shaped population growth $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$, r represents
a) Carrying capacity b) Environmental resistance c) Intrinsic rate of natural increase
d) Population size
93. In a growing population of a country,
a) reproductive and pre-reproductive individuals are equal in number
b) reproductive individuals are less than the post reproductive individuals
c) pre-reproductive individuals are more than the reproductive individuals
d) pre-reproductive individuals are less than the reproductive individuals.

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94. Dart frogs (*Phylllobates bicolor*, *Dendrobates pumilio*) found in tropical rain forests of South America are highly poisonous as well as brightly coloured to be easily noticed. This is referred to as
a) camouflage b) mimicry c) warning colouration d) none of these
95. A behavioural strategy of adaptation called echolocation is found in
a) bats b) butterfly c) praying mantis d) arctic tern
96. All of the following statements concerning the Actinomycetes filamentous soil bacterium Frankia are correct except that Frankia _____.
a) Can induce root nodules on many plant species.
b) Cannot fix nitrogen in the free-living state.
c) Forms specialised vesicles in which the nitrogenase is protected from oxygen by a chemical barrier involving triterpene hopanoids.
d) Like Rhizobium, it usually affects its host plant through root hair deformation and stimulates cell proliferation in the host's cortex.
97. What is the percentage of air in the soil?
a) 50 b) 10 c) 45 d) 25
98. The molecular action of ultraviolet light is mainly reflected through -
a) Destruction of hydrogen bonds in DNA b) Photodynamic action
c) Formation of pyrimidine d) Formation of sticky metaphase
99. Which type of interaction is being shown in the given figure?

a) Parasitism b) Commensalism c) Predation d) Amensalism
100. The maximum growth rate occurs in _____.
a) stationary phase b) senescent phase c) lag phase d) exponential phase
101. Forest near equator region are called -
a) Deciduous b) Tropical rain forests c) Coniferous forests d) Temperature forest
102. Amensalism is an association between two species where
a) one species is harmed and other is benefitted
b) one species is harmed and other is unaffected
c) one species is benefitted and other is unaffected d) both the species are harmed.
103. Cowbirds lay their eggs in the nests of smaller birds. The fast-developing cowbird chicks hatch first, then push the other baby chicks out of the nest as they hatch. The cowbird is classified as a
a) pathogen b) parasite c) mutualist d) commensal.
104. Assertion : Elimination of a competitively inferior species in a closely related or otherwise similar group is known as competitive exclusion principle.
Reason: If two species compete for the same resource, they could avoid competition by

choosing different times for feeding or different foraging patterns.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

105. Competition for food, light and space is most severe in -

a) Closely related species growing in the same area (in the same niche)

b) Closely related species growing in different habitat

c) Distantly related species growing in the same habitat

d) Distantly related species growing in different habitat

106. The interdependent evolution of flowering plants and pollinating insects together is known as

a) mutualism b) co-evolution c) commensalism d) co-operation

107. The storage of energy at consumer level is known as -

a) Gross primary production b) Secondary productivity c) Net primary productivity

d) Net productivity

108. Tropical forests occur in India.

a) Jammu and Kashmir b) Rajasthan c) Kerala and Assam

d) The forests do not occur in India

109. The main aim of plant conservation is -

a) To conserve the necessary ecological activities and life supporting systems

b) To conserve species diversity and range of genetic material c) Both the above

d) None of the above

110. Group of two or more than two plant species is called as:-

a) Plant community b) Animal ecosystem c) Plant ecosystem d) Ecological niche

111. Mycorrhizae are the example of _____.

a) Amensalism b) Antibiosis c) Mutualism d) Fungistasis

112. Which ecosystem has maximum number of producers in an unit area

a) Pond b) Grassland c) Forest d) Tundra

113. Soil particles determine is _____.

a) texture b) held capacity c) water-holding capacity d) soil flora

114. Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their _____.

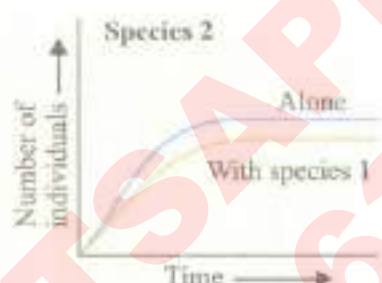
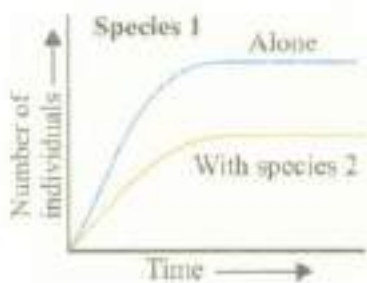
a) defence action b) effect on reproduction c) nutritive value d) growth response

115. The prickly pear cactus became unusually abundant after its introduction in Australia, because it

a) had no coevolved herbivores b) formed new mycorrhizal association c) lost its thorns

d) all of these

116. In a pond, last year there were 30 lotus plants. Through reproduction, 25 new lotus plants were added in one year while 8 plants died. The birth and death rates for the lotus population respectively are _____ and _____ individuals per lotus per year.
a) 0.83, 0.26 b) 0.26, 0.83 c) 0.25, 0.80 d) 0.80, 0.25
117. Why you never see cattle or goats browsing on weed Calotropis?
a) The plant produces highly poisonous tannins
b) The plant produces quinine which is bitter in taste.
c) The plant produces poisonous cardiac glycosides. d) The plant bears prickles.
118. Which of the following forest plants controls the light conditions at the ground?
a) Lianas and climbers b) Shrubs c) Tall trees d) Herbs
119. In laboratory experiments, two species of the protist Paramecium (species 1 and 2) were grown alone and in the presence of the other species. The following graphs show growth of species 1 and species 2, both alone and when in mixed culture with the other species



- Which of the following conclusions can be drawn from the graphs?
- a) Competitive exclusion occurred in these experiments.
b) Both species are affected by interspecific competition but species 1 is affected less.
c) Both species are affected by interspecific competition but species 2 is affected less.
d) Both species are affected equally by interspecific competition.
120. Assertion: Mycorrhizae represent a mutually beneficial interspecific interaction of fungi with roots of higher plants.
Reason: In a mutualistic relationship, both the organisms enter into some sort of physiological exchange.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
121. Ice fish and Antarctic fish remain active in extremely cold water due to:
a) development of thick layer of sub-cutaneous fat
b) development of extra solute in body fluids
c) development of ice nucleating protein in extra cellular spaces d) both (b) and (c)
122. Which of the following soils show cracks and shrinks most as it dries?
a) Porous soil b) Clay soil c) Loam soil d) Sandy soil

123. Assertion: Small sized animals are rarely found in polar regions.
Reason: Small sized animals have larger surface area relative to their volume and they have to spend much energy to generate body heat through metabolism.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
124. A freshwater organism cannot survive in a water body that has greater _____ than its original habitat.
a) oxygen content b) depth c) salt concentration d) water clarity
125. Which one of the following organisms reproduces sexually only once in its life time?
a) Banana plant b) Mango c) Tomato d) Eucalyptus
126. In the formula $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$, $\left(\frac{K-N}{K}\right)$ stands for
a) Environmental resistance b) Reproductive potential c) Growth rate
d) Carrying capacity
127. Seasonal variations on Earth occur due to its
a) tilted axis b) rotation around its own axis c) revolution around sun d) both (a) and (c)
128. Three water bodies were tested for salinity of water. Water body X showed salt concentration as 3 parts per thousand Y showed 35 parts per thousand and Z showed 11a parts per thousand salinity.
Select the correct option regarding this
a) X can be a lagoon b) Y can be a sea c) Z can be an inland river d) None of these
129. Competitive exclusion principle stating that inferior species is eliminated eventually after prolonged competition was given by
a) Allen b) Pearl-Verhulst c) Gause d) Darwin
130. Which of the following is not a part of an organism's physical environment?
a) Temperature b) Light c) Other organisms d) Humidity
131. If N = population density at time t , then population density at time $t + 1$ can be written as
$$N_{t+1} = N_t + [(A + B) - (C + D)]$$

Select the correct option for A, B, C and D in the above equation.
a) C can be mortality and D can be immigration.
b) A can be natality and D can be emigration. c) A can be mortality and B can be natality
d) B can be immigration and C can be natality.
132. Read the given statements and select the correct option.
Statement 1: Cow in India and Kangaroo in Australia (both herbivores) are ecological equivalents.
Statement 2: The organisms having similar niche in different geographical regions are known as ecological equivalents.

- a) Both statements 1 and 2 are correct.
 b) Statement 1 is correct but statement 2 is incorrect
 c) Statement 1 is incorrect but statement 2 is correct.
 d) Both statements 1 and 2 are incorrect
133. Which of the following shows biological antagonism or allelopathy?
 a) Amensalism b) Protoco-operation c) Competition d) Parasitism
134. Which of the following equations correctly represents Verhulst-Pearl logistic growth?
 a) $dN/dt = rN \left(\frac{K-N}{K} \right)$ b) $dN/dt = \frac{rN}{K}$ c) $dN/dt = \frac{N(K-N)}{K}$ d) $dN/dt = \frac{r(K-N)}{K}$
135. **Opuntia** has spine like leaves which help in
 a) reducing the rate of transpiration b) increasing the rate of transpiration
 c) increasing the rate of photosynthesis d) reducing the rate of photosynthesis.
136. Assertion: Prolonged intraspecific competition cause an increase in the size of the niche of a population.
 Reason : In such a population, use of a new type of resource will increase through the generations.
 a) If both assertion and reason are true and reason is the correct explanation of assertion.
 b) If both assertion and reason are true but reason is not the correct explanation of assertion.
 c) If assertion is true but reason is false. d) If both assertion and reason are false.
137. Organisms show migration in order to avoid unfavourable conditions of
 a) temperature b) food availability c) precipitation d) all of these
138. An interaction between two individuals where one is benefitted while the other is neither benefitted nor harmed is called as
 a) predation b) symbiosis c) amensalism d) commensalism.
139. Salt concentration (salinity) of the sea measured in parts per thousand is
 a) 10-5 b) 30-70 c) 0-5 d) 30-35.
140. Which of the following atmospheric pollutant is not produced by the exhaust of motor vehicle in Delhi -
 a) SO_2 b) Hydrocarbon gases c) Fly ash d) CO
141. Ecology is basically concerned with how many levels of biological organisation?
 a) Three b) Four c) Two d) Five
142. Following table summarises the differences between natality and mortality. Select the incorrect ones.

Natality	Mortality
i) Natality is number of births per unit population per unit time.	It is number of deaths per unit population per unit time
ii) It adds new individuals to the population.	It removes individuals from the population.

iii) It increases the size of population.	It decreases the size of population.
iv) It increases population density.	It reduces population density.
v) It is low when population size is small and high when population size is large	It is high when population size is small and low when population size is large

a) (i) and (v) b) (iii) and (iv) c) (iv) only d) (v) only

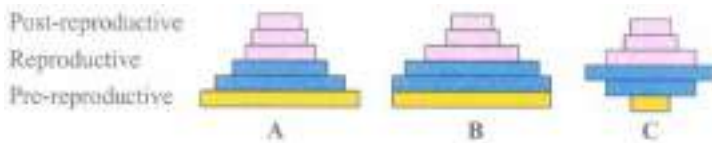
143. Archaeobacteria that flourish in temperature above 100°C have special _____ molecules that do not coagulate at high temperatures and remain functional.
a) carbohydrate b) ester c) protein d) fat
144. Which one of the following is one of the characteristics of a biological community?
a) Stratification b) Natalty c) Mortality d) Sex ratio
145. Size of clay particles is
a) Between 0.00002-0.02 mm b) Less than 0.002 mm c) 0.5-1.0 mm d) 0.02-0.2 mm
146. A sedentary sea anemone gets attached to the shell lining of hermit crab. The association is _____.
a) Symbiosis b) Commensalism c) Amensalism d) Ectoparasitism
147. Study of interrelationships between living organisms and their environment is _____.
a) Ecology b) Ecosystem c) Phytogeography d) Ethology
148. Stable plant community formed during succession is called -
a) Sere community b) Climax community c) Dominant community d) Ecotone
149. The relation between algae and fungi in a lichen is _____.
a) symbiosis b) parasitism c) commensalism d) protocoooperation
150. The flow of materials from non living components to living components and back to the non living components in a more or less cyclic manner is called a -
a) Gaseous cycle b) Sedimentary cycle c) Biogeochemical cycle d) Hydrologic cycle
151. Parameters related to age structure include
a) fecundity (birth rate) b) generation time c) death rate d) all of these
152. Niche is:
a) the range of temperature that the organism needs to live
b) the physical space where an organism lives
c) all the biological factors in the organism's environment
d) the functional role played by the organism where it lives
153. Next to temperature, water is the most important factor influencing the life of organism. Which among the following water characteristics is not an influencing character
a) Colour b) Salinity c) pH d) Turbidity
154. Two different species cannot live for long duration in the same niche or habitat. This law is called
a) Allen's law b) Gloger rule c) Competitive exclusion principle d) Weisman's theory
155. Competitive exclusion principle was given by

- a) J.Grinnel b) Gause c) Lindeman d) Bates
156. A population has more young individuals compared to the older individuals. What would be the status of the population after some years?
- a) It will decline b) It will stabilise. c) It will increase
d) It will first decline and then stabilise
157. Read the following statements and select the correct option.
Statement 1 : The prickly pear cactus introduced into Australia in early 1920s caused havoc by spreading rapidly into millions of hectares of rangeland.
Statement 2 : When certain exotic species are introduced into a geographical area, they become invasive and start spreading fast because the invaded land does not have its natural predators
- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
158. Which of the following statements is/are incorrect?
- (i) The liver fluke, a parasite, depends on intermediate hosts (a snail) to complete its life cycle.
(ii) The malarial parasite needs a vector (mosquito) to spread to other host organisms.
(iii) In case of brood parasitism, the eggs of parasitic birds are not detected and removed from the nest because the parasite's eggs resemble the host's eggs in morphology and colour.
(iv) A population of frogs protected from all predators would increase indefinitely.
- a) (i) and (iv) b) (iii) and (iv) c) Only (i) d) None of these
159. Temperature is one of the important abiotic factor. Significance of temperature on living beings can be realised through
- a) Kinetics of enzymes b) Basal metabolism c) Physiological function d) All the above
160. Which of the following is a man made artificial ecosystem:
- a) Grassland ecosystem b) Forest ecosystem c) Ecosystem of artificial lakes & dams
d) None of these
161. Majority of plants belongs to which of the following category
- a) Regulators b) Conformers c) Partial regulators d) More than one correct
162. Read the given examples of animal interactions.
- (i) An orchid growing as an epiphyte on a mango branch.
(ii) Barnacles growing on the back of a whale.
(iii) Clown fish living among the stinging tentacles of sea anemone.
(iv) Cattle egrets foraging close to the grazing cattle. Which kind of interaction is being cited by these?
- a) Competition b) Amensalism c) Mutualism d) Commensalism
163. Many freshwater organisms cannot live for long in seawater because the surrounding water will be _____ to body cells and _____ may occur.

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- a) hypertonic, exosmosis b) hypertonic, endosmosis c) hypotonic, exosmosis
d) hypotonic, endosmosis

164. What does the shape of the given age pyramids (A to C) reflect about the growth status of populations?



a)

A	B	C
Declining	Stable	Expanding

b)

A	B	C
Stable	Expanding	Declining

c)

A	B	C
Expanding	Stable	Declining

d)

A	B	C
Declining	Expanding	Stable

165. Temperature changes in the environment affect most of the animals which are _____.

- a) homeothermic b) aquatic c) poikilothermic d) desert living

166. To which of the following interactions both partners are adversely affected:

- a) Competition b) Predation c) Parasitism d) Mutation

167. Temperature is considered as the most ecologically relevant environmental factor because it affects _____ of organisms.

- a) physiology b) morphology c) geographical distribution d) all of these

168. The kangaroo rat in North American deserts is capable of meeting all its water requirements by/through

- a) Ability to dilute its urine b) Ability to concentrate its urine c) Internal fat oxidation
d) More than one option is correct

169. If water pollution continues at its present rate, it will eventually -

- a) Stop water cycle b) Prevent precipitation
c) Make oxygen molecules unavailable to water plants
d) Make nitrate molecules unavailable to water plants

170. Artificial selection to obtain cows yielding higher milk output represents : _____.

- a) Directional as it pushes the mean of the character in one direction.
b) as it splits the population into two, one yielding higher output and the other lower output.
c) Stabilizing followed by disruptive as it stabilizes the population to produce higher yielding cows.
d) Stabilizing selection as it stabilizes this character in the population.

171. Behavioural response to cope with variations in the environment can be seen in

- a) CAM plants b) Kangaroo Rat c) Desert lizards d) Archaeobacteria

172. When two similar species live in the same area, they may evolve to become more different in order to:

- a) drive the other species to extinction b) reduce competition
c) use up the other species resources d) reduce genetic variation

173. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. An endothermic animal	(i) Sea anemone
B. An ectothermic animal	(ii) Man
C. Organism of benthic zone	(iii) Lizard
D. An organism exhibiting camouflage	(iv) Chameleon

- a) A-(iv), B-(iii), C-(i), D-(ii) b) A-(ii), B-(i), C-(iii), D-(iv) c) A-(ii), B-(iii), C-(i), D-(iv)
d) A-(i), B-(ii), C-(iii), D-(iv)

174. Read the following statements and select the correct ones.

- (i) All the colour components of the visible spectrum are available for marine plants living in different depths of the ocean.
(ii) Many herbs and shrubs in rainforests adapt to photosynthesise optimally under very low light conditions as they grow under canopy trees.
(iii) Gradual increase in average global temperature will affect the distributional range of some species.
(iv) The quality of soil does not depend upon the weathering process.
a) (i) and (ii) b) (ii) and (iv) c) (ii) and (iii) d) (i) and (iv)

175. The ecological pyramid of numbers in pond ecosystem is -

- a) Upright b) Inverted c) May upright or Inverted d) First upright then Inverted

176. Presence of plants arranged into well defined vertical layers depending on their height can be seen best in: _____.

- a) Tropical Rain Forest b) Grassland c) Temperate Forest d) Tropical Savannah

177. Soil water available to roots is _____.

- a) surface water b) hygroscopic water c) gravitational water d) capillary water

178. Exponential growth is observed in a population when

- a) resources in the habitat are unlimited
b) each species has the ability to realise its full innate potential c) both (a) and (b)
d) none of these.

179. Which of the following statements is incorrect?

- a) The flora of a place is heavily defined by availability and quality of water
b)
The availability of light on land is closely linked with that of temperature since Sun is the source for both.
c) Topography does not affect biodiversity
d) Soil composition also affects the seepage of water into ground


180. Which one is appropriately defined?

- a) Host is an organism which provides food to another organism
b)
Amensalism is a relationship in which one species is benefitted while the other is unaffected
c) Predator is an organism that catches and kills the other organism for food
d) Parasite is an organism that always lives inside the body of the organism and may kill it

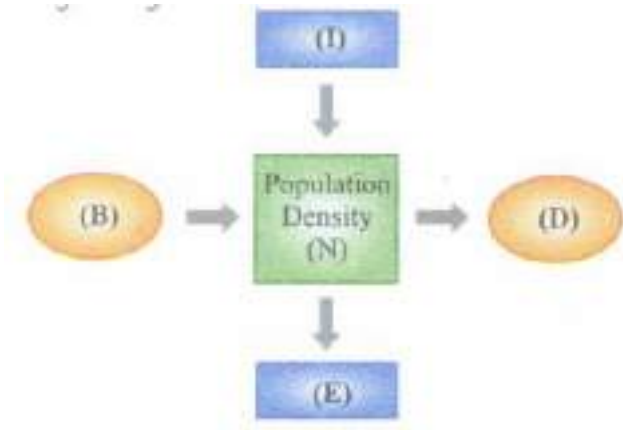
181. Ecosystem term coined by -
a) Odum b) Mishra c) Reiter d) Tansley
182. Read the following statements and select the correct option.
Statement 1 : Plants need the help of insects and animals for pollinating their flowers and dispersing their seeds.
Statement 2 : Plants offer rewards in the form of pollen and nectar for pollinators and juicy and nutritious fruits for seed dispersers.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect
183. The following graph depicts changes in two populations (A and B) of herbivores in a grassy field possible reason for these changes is the _____.
a) Population B competed more successfully for food than population A.
b) Population A produced more offspring than population B.
c) Population A consumed the members of population B.
d) Both plant populations in this habitat decreased
184. Alluvial soils are mostly found in
a) Northern India b) Eastern India c) Southern India d) Ganges and Jamuna plains
185. Which of the following is the main factor of water pollution -
a) Smoke b) Industrial waste c) Detergent d) Ammonia
186. The soil near the surface is usually darker than the soil about one meter down. This is because the top soil is
a) Young & wet b) Richer in organic matter c) Richer in Ca & Mg d) Dry
187. Which biotic components mainly help in recycling of minerals -
a) Producers b) Consumers c) Decomposers d) All the above
188. Life is sustainable with water only because:
a) it makes 90% of the protoplasm
b) translocation of nutrients inside the body occurs with the help of water
c) water loss in form of sweating helps to maintain body temperature d) all of these
189. The concept that population tends to increase geometrically while food supply increases arithmetically was put forward by _____.
a) Stuart Mill b) Adam Smith c) Charles Darwin d) Thomas Malthus
190. Niche of a species in an ecosystem refers to its _____ function at its place of occurrence.
a) function at its place of occurrence b) place of its occurrence c) competitive ability
d) centre of origin
191. _____ rule states that mammals from colder climates generally have shorter ears and limbs to minimise heat loss.
a) Allen's b) Berger's c) Borge's d) Powell's

192. Two species competing for the same resource can avoid competition by choosing different habits. This phenomenon is called _____ and was supported by _____.
a) competitive exclusion, Gause b) competitive exclusion, MacArthur
c) resource partitioning, Gause d) resource partitioning, MacArthur
193. Assertion: The rate at which a population can be expected to grow in the future can be assessed graphically by means of a population pyramid.
Reason: A triangular population pyramid is characteristic of a country whose population is stable, neither growing nor shrinking.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
194. Nature and properties of soil depends upon
a) climate b) weathering process c) development of soil d) all of these
195. Kangaroo and desert rat that live in conditions of water scarcity are capable of meeting all their water requirements by
a) having a thick coat to minimise evaporative desiccation
b) oxidising stored fat to produce water as by product
c) producing very concentrated urine and solid faeces d) all of these.
196. Sunken stomata is the characteristic feature of _____.
a) hydrophyte b) mesophyte c) xerophyte d) halophyte
197. Which of the following equations correctly represents the exponential population growth curve?
a) $dN/dt = rN$ b) $dN/dt = rN$ c) $N_t = N_0 e^{rt}$ d) Both (a) and (c)
198. Gross primary productivity is -
a) Rate at which organic molecules are formed in autotroph
b) Rate at which organic molecules are used up by an autotroph
c) Storage of organic molecules in the body of an autotroph
d) Rate at which organic molecules are transferred to next higher trophic level
199. Choose the correct match?
a) Trapa, Dionaea, Drosera b) Nepenthes, Utricularia, Vanda
c) Utricularia, Drosera, Dionaea d) Dionaea, Trapa, Vanda
200. If a lake is contaminated with DDT, its highest concentration would be found in -
a) Primary consumer b) Secondary consumer c) Tertiary consumer d) None of these
201. The interaction between two living organisms of different species which is beneficial to both, but is not obligatory because they can live without each other is known as
a) Proto-cooperation b) Mutualism c) Commensalism d) Amensalism
202. Amount of biomass or organic matter produced per unit area over a time period is represented or expressed in terms of

- a) Weight ($\text{gm}^{-2} \text{yr}^{-1}$) b) Energy (Kcal m^{-2}) c) Fresh weight d) Dry weight
203. Cuscuta is an example of:
a) Endo-parasitism b) Predation c) Ecto-parasitism d) Brood parasitism
204. In some cases, population density is measured in terms of biomass rather than in terms of numbers because:
a) it is a more meaningful measure when the considered organisms vary greatly in size
b)
it is more convenient when population is huge and counting is impossible or very time consuming
c) it is a relatively constant measure d) both (a) and (b)
205. Many animals use the diurnal and seasonal variations in light intensity and photoperiod to time their
a) migration b) reproductive activities c) suspension d) all of these
206. Different biomes are formed due to annual variations in over _____ the earth's surface.
a) temperature b) precipitation c) incident solar radiation d) all of these
207. Vulture in an ecosystem are -
a) Predators b) Scavengers c) Consumers d) Top carnivores
208. If an organism's body pattern resembles its environment making it difficult to spot, it is called as
a) camouflage b) mimicry c) warning colouration d) both (a) and (b)
209. Praying mantis is a good example of _____.
a) warning colouration b) social insects c) camouflage d) Mullerian mimicry
210. Pyramids of energy are -
a) Always upright b) Always Inverted c) Mostly upright d) Mostly inverted
211. A biologist studied the population of rats in a barn. He found that the average natality was 250, average mortality 240. immigration 20 and emigration 30. The net increase in population is _____.
a) 15 b) 05 c) Zero d) 10
212. A place has very scanty rainfall, the nommam plants there may be:
a) Opuntia b) Nymphaea c) Asparagus d) both (a) and (c)
213. Gause's principle of competitive exclusion states that:
a) More abundant species will exclude the less abundant species through competition
b) Competition for the same resources excludes species having food preferences
c) No two species can occupy the same niche indefinitely for the same limiting resources
d) Larger organisms exclude smaller ones through competition
214. Assertion: The aquatic organisms in which the osmotic concentration and temperature of body change according to the ambient conditions of water are referred to as conformers.
Reason: Aquatic organisms are able to maintain homeostasis through thermoregulation and osmoregulation by physiological or behavioural means.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
215. Read the following statements and select the correct option.
Statement 1: Brood parasitism in birds is an example of parasitism in which the parasitic bird lays its eggs in the nest of its host and the host incubates them.
Statement 2: During the course of evolution, the eggs of the parasite bird have evolved to resemble the host's eggs in size and colour to reduce the chances of the host bird detecting the foreign eggs and removing them from the nest.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct
d) Both statements 1 and 2 are incorrect.
216. It is much easier for a small animal to run uphill than for a large animal because:
a) The efficiency of muscles in large animals is less than in small animals
b) It is easier to carry small body weight c) Smaller animals have a higher metabolic rate
d) Small animals have a lower O_2 requirement
217. Large ecosystem are called -
a) Biomes b) Ecotone c) Ecade d) Biocoenosis
218. Total number of individuals of a species per unit area and per unit time is called:
a) population size b) population density c) demography d) population dynamics
219. The density of a population in a given habitat during a given period, fluctuates due to changes in certain basic processes. On this basis, fill up boxes A and B in the given flow chart with correct option.
- 
- ```
graph LR; A((A)) --> N[Population Density (N)]; N --> B((B))
```
- a) A - Natality, B - Mortality b) A - Immigration, B - Emigration  
c) A - Natality, B - Immigration d) Both (a) and (b)
220. Organisms that can maintain a constant internal temperature are called as  
a) homoiothermic b) poikilothermic c) oligothermic d) heterothermic
221. What parameters are used for tiger census in our country's national parks and sanctuaries?  
a) Pug marks only b) Pug marks and faecal pellets c) Faecal pellets only  
d) Actual head counts
222. Deep black soil, is productive due to high proportion of \_\_\_\_\_.  
a) sand and zinc b) gravel and calcium c) clay and humus d) silt and earthworm

223. The given figure represents different factors affecting population density (N). If B = natality, D = mortality, E = emigration and I = immigration; then select the incorrect option regarding these



- a) B and D are most influential factors under normal conditions while I and E become important in special conditions.  
 b) In a new habitat just being colonised, I becomes more important than B.  
 c) B and I cause positive changes in N. d) I is generally equal to E.
224. Refer to the given table. If '+' sign has been assigned for beneficial interaction, '-' sign for detrimental interaction and '0' for neutral interaction, identify the type of interaction (i), (ii) and (iii) and select the correct option.

| Species A | Species B | Type of interaction |
|-----------|-----------|---------------------|
| -         | -         | (i)                 |
| +         | -         | (ii)                |
| +         | 0         | (iii)               |

a)

|           |            |            |
|-----------|------------|------------|
| (i)       | (ii)       | (iii)      |
| Predation | Parasitism | Amensalism |

b)

|             |           |              |
|-------------|-----------|--------------|
| (i)         | (ii)      | (iii)        |
| Competition | Predation | Commensalism |

c)

|             |            |              |
|-------------|------------|--------------|
| (i)         | (ii)       | (iii)        |
| Competition | Parasitism | Commensalism |

d) Both (b) and (c)

225. Diffuse porous woods are characteristic of plants growing in \_\_\_\_\_.

a) tropics b) alpine region c) cold winter regions d) temperate climate

226. Earliest settlers on barren lands or the farmers of nature are

a) Diatoms b) Lichens c) Moss & grasses d) Ferns

227. Read the following statements about adaptations in desert plants and select the correct ones.

- (i) They have a thick cuticle on their leaf surfaces.  
 (ii) They have stomata present in deep sunken pits.  
 (iii) They use CAM pathway for photosynthesis.  
 (iv) They have flattened stems and large sized leaves.  
 (v) Their stomata remain closed during the day.

a) (i), (ii) and (iii) b) (ii), (iii) and (v) c) (i), (ii) and (iv) d) (i), (ii), (iii) and (v)

228. The birth and death rates of four countries are given below. Which one will have the least population growth rate?

| Country | Birth rate/1000 | Death rate / 1000 |
|---------|-----------------|-------------------|
|---------|-----------------|-------------------|

|   |    |    |
|---|----|----|
| P | 15 | 5  |
| Q | 25 | 10 |
| R | 35 | 18 |
| S | 48 | 41 |

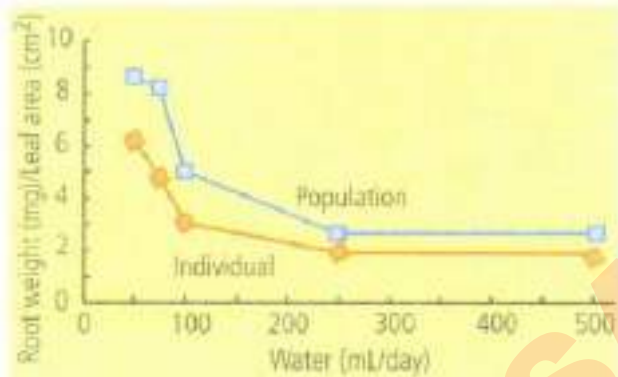
a) P   b) Q   c) R   d) S

229. What will happen to a well growing herbaceous plant in the forest if it is transplanted outside the forest in a park?  
 a) It will grow normally.   b) It will grow well because it is planted in the same locality.  
 c) It may not survive because of change in its microclimate.  
 d) It grows very well because the plant gets more sunlight.
230. Which of the following is an incorrect match?  
 a) Bacteria -Thick walled resting spores   b) Bear - Hibernation  
 c) Zooplanktons - Diapause   d) Lizard - Aestivation
231. River water depos \_\_\_\_\_.  
 a) loamy soil   b) alluvial soil   c) laterite soil   d) sandy soil
232. Which of the following statement is correct with regard to Bergmann's rule?  
 a) Animals of colder area have large size than of hot areas.  
 b) Fish of colder area have large size.   c) Birds of colder areas have narrow wings  
 d) Animals of colder areas possess thick fur.
233. The plant - animal interactions often involve co-evolution of the mutualists so that  
 a) the mutually beneficial system could be safeguarded against 'cheaters'  
 b)  
 a given plant species can be pollinated only by its partner animal species and no other species  
 c) the animal utilises plant not only for oviposition but also to pollinate the plant  
 d) all of these
234. A mutually beneficial association necessary for survival of both partners are \_\_\_\_\_.  
 a) mutualism/symbiosis   b) commensalism   c) amensalism   d) Both (a) and (b)
235. Choose the correct sequence of stages of growth curve for bacteria.  
 a) Lag, log, stationary decline phase   b) Lag, log, stationary phase  
 c) Stationary, lag, log, decline phase   d) Decline, lag, log phase
236. Removal of the soil by the action of wind and water is known as -  
 a) Erosion   b) Fossilization   c) Leaching   d) Calcification
237. Which of the following is correctly matched?  
 a) Aerenchyma-opuntia   b) Age pyramid-Biome  
 c) Parthenium hysterophorus-Threat to biodiversity   d) Stratification-Population
238. Assertion : The epiphytes use the trees only for attachment and manufacture their own food by photosynthesis.  
 Reason: Commensalism results in negative effects on the growth and survival of one or both of the populations.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.  
b)  
If both assertion and reason are true but reason is not the correct explanation of assertion.  
c) If assertion is true but reason is false. d) If both assertion and reason are false.
239. Geometric representation of age structure is a characteristic of \_\_\_\_\_.  
a) population b) landscape c) ecosystem d) biotic community.
240. The method by which endangered plant species are conserved in a botanical garden or in some controlled circumstances -  
a) Afforestation b) In situ conservation c) Ex situ conservation d) None of the above
241. Read the given statements and select the correct option.  
Statement 1: Study of a single individual or a population in relation to environment is called autecology.  
Statement 2: Study of group of individuals or a community in relation to environment is known as synecology.  
a) Both statements 1 and 2 are correct  
b) Statement 1 is correct but statement 2 is incorrect  
c) Statement 1 is incorrect but statement 2 is correct.  
d) Both statements 1 and 2 are incorrect
242. Asymptote in a logistic growth curve is obtained when:  
[For logistic growth  $dN = rN[K-N]/K$   
If  $K = N$  then  $= K - N/K$  O,  $\therefore [dN/dt = 0] = 0$   
a) The value of 'r' approaches zero b)  $K = N$  c)  $K > N$  d)  $K < N$
243. Read the following statements and select the incorrect ones.  
(i) Homeostasis ensures constant osmotic concentration of cells.  
(ii) The famous Keoladeo National Park (Bharatpur) in Rajasthan hosts thousands of migratory birds coming from Siberia, in every winter.  
(iii) 99% of animals and nearly all plants are regulators.  
(iv) The conformers are able to maintain their body temperature in spite of changes in ambient temperature.  
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (i) and (iv)
244. In a growing population of a country.  
a) reproductive and pre-reproductive individuals are equal in number.  
b) reproductive individuals are less than the post reproductive individuals.  
c) pre-reproductive individuals are more than the reproductive individuals.  
d) pre-reproductive individuals are less than the reproductive individuals.
245. Assertion : External parasitism is generally marked by much more extreme specialisation than internal parasitism.  
Reason: The structure of an internal parasite is usually very complex  
possessing suckers, reproductive organs, etc

- a) If both assertion and reason are true and reason is the correct explanation of assertion.  
b)  
If both assertion and reason are true but reason is not the correct explanation of assertion.  
c) If assertion is true but reason is false. d) If both assertion and reason are false.




246. To determine the effect of intra-specific competition on the growth of saplings of Eucalyptus dives, an experiment was designed in which two sets of pots were used. In the first set only 1 sapling was planted per pot and in the other set 16 saplings were planted per pot. To check for the effect of intra-specific competition on allocation of resources, a decreasing amount of water was added to each set. The results have been graphically indicated below. Which of the following conclusions can be best drawn from the study?



- a) More resources are allocated to the root during low water conditions  
b)  
Competition for water among individuals of a population causes more root growth as compared to individuals who are growing alone.  
c) Lesser leaves are formed under low water conditions  
d)  
Root growth is higher in individuals grown singly as compared to individuals in populations.
247. Formation of tropical forests needs mean annual temperature and mean annual precipitation as:  
a) 18-25°C and 150-400 cm b) 5-15°C and 50-100 cm c) 30-50°C and 100-150 cm  
d) 5-15°C and 100-200 cm.
248. Which is more important for water pollution -  
a) Sound b) SO<sub>2</sub> c) Salts of arsenic d) Sewage
249. Most harmful radiation is  
a) UV-A b) UV-B c) UV-C d) All are equally harmful
250. On the rocky sea coasts of Scotland, the larger and competitively superior barnacle Balanus dominates the intertidal area and excludes the smaller barnacle Chathamalus from that zone. Which kind of interaction is being depicted by this example?  
a) Predation b) Parasitism c) Commensalism d) Competition
251. Which of the following problems does the frequent deep sea diver organisms like whales may face?  
a) Compression of tissues surrounding air filled cavities b) High blood nitrogen levels  
c) Lack of oxygen d) All of these

252. Study the following statements and select the correct ones.
- (i) Organisms capable to tolerate a wide range of temperature are called stenothermal organisms
  - (ii) Thermal tolerance of different species determines their geographical distribution to a large extent.
  - (iii) Average temperature in tropical deserts in summer is  $< 50^{\circ}\text{C}$ .
  - (iv) Thermal springs cannot sustain life due to very high average temperature i.e.,  $> 100^{\circ}\text{C}$ .
- a) (i) only   b) (ii) only   c) (i), (ii) and (iii)   d) (i), (iii) and (iv)
253. A group of individuals living in a particular geographical area at a particular time is called
- a) Local population   b) Deme   c) Community   d) Both (1) & (2)
254. Assertion: Plant-animal interactions do not generally involve co-evolution of the mutualist organisms.
- Reason: Evolution of the plants and animals can never go side by side.
- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
- If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false.   d) If both assertion and reason are false.
255. Consider the following statements (i) - (iv) each having one or two blanks
- (i) Bears go into (1) during winter to (2) cold weather.
  - (ii) A conical pyramid with a broad base represents (3) human population.
  - (iii) A wasp pollinating a fig flower is an example of
  - (iv) An area with high level of species richness is known as (5).
- a) (3) - expanding, (4) - commensalism (5) - biodiversity park
- b) (1) - hibernation, (2) - escape, (3) - expanding, (5) - mutualism
- c) (3) - stable, (4) - commensalism (5) - marsh
- d) (1) - aestivation, (2) - escape, (3) - stable, (5) - mutualism
256. Which part of the world has high density of organisms?
- a) Deciduous forests   b) Grasslands   c) Savannas   d) Tropical rain forests
257. B. O. D. is connected with
- a) Organic matter   b) Microbes   c) Both   d) None
258. Autecology is the
- a) relation of heterogenous population to its environment
  - b) relation of an individual to its environment   c) relation of a community to its environment
  - d) relation of a biome to its environment.
259. Most animals are tree dwellers in a: \_\_\_\_\_.
- a) Thorn woodland   b) Temperate deciduous forest   c) Tropical rain forest
- d) Coniferous forest
260. According to Allen's Rule, the mammals from colder climates have
- a) shorter ears and longer limbs   b) longer ears and shorter limbs
  - c) longer ears and longer limbs   d) shorter ears and shorter limbs.



261. A population in which number of pre-reproductive individuals is very large, number of reproductive individuals is moderate while post-reproductive individuals are fewer. Which kind of age pyramid is represented by such a population?
- a)  b)  c)  d) Cannot be determined
262. Ecosystem is -
- a) Any function unit that includes the whole community in a given area interaction with the abiotic factors
- b) A group of green plants c) A group of animals interacting with environment
- d) Man and pets living together
263. The principle of competitive exclusion was enunciated by:
- a) Verhulst and Pearl b) C. Darwin c) G.F. Gause d) Mac Arthur
264. Very small animals are rarely found in polar regions because
- a) small animals have a larger surface area relative to their volume, so they lose body heat very fast when it is cold outside
- b) small animals have a smaller surface area relative to their volume, so they lose body heat very fast when it is cold outside
- c) small body volume makes internal heat production very difficult d) none of these.
265. If the age distribution is plotted for a population, the resulting structure is called as:
- a) age graph b) age curve c) age pyramid d) age diagram.
266. In which of the following interactions both partners adversely affected?
- a) Predation b) Parasitism c) Mutualism d) Competition
267. Which of the following is not a factor that would limit the growth of a population?
- a) Food shortage b) Immigration c) Disease d) Famine
268. Acid rains are due to -
- a)  $O_3$  b)  $SO_2 + NO_2$  c) CO d)  $CO_2$
269. The formula for exponential population growth is \_\_\_\_\_.  
a)  $dN/rN = dr$  b)  $rN/dN = dt$  c)  $dN/dt = rN$  d)  $dt/dN = rN$
270. Ecotone is
- a) a polluted area b) the bottom of a lake
- c) a zone of transition between two communities d) a zone of developing community.
271. Which of the following is not an example of preypredator relationship?
- a) Tiger eating a deer b) Plant *Nepenthes* trapping an insect
- c) Bacteria decomposing organic matter d) Crocodile killing a man
272. Water is the second most important factor influencing life of organisms because

- a) it makes major part of an organism's body  
 b) productivity of plants depend upon availability of water  
 c) life on Earth originated in water d) both (a) and (b).
273. What is the intensity of sounds in normal conversation  
 a) 10 - 20 decibal b) 30 - 60 decibal c) 70 - 90 decibal d) 120 - 150 decibal
274. The equation for J-shaped population growth curve is:  
 a)  $\frac{dN}{dt} = rN$  b)  $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$  c)  $N_t = N_0 + B + I - D - E$  d)  $D = \frac{N}{S}$
275. Soil best suited for plant growth is \_\_\_\_\_.  
 a) clay b) loamy c) sandy d) gravel
276. What is a keystone species?  
 a)  
 A species which makes up only a small proportion of the total biomass of a community yet has a huge impact on the community's organization and survival.  
 b)  
 A common species that has plenty of biomass, yet has a fairly low impact on the community's organisation.  
 c)  
 A rare species that has minimal impact on the biomass and on other species in the community.  
 d)  
 A dominant species that constitutes a large proportion of the biomass and which affects many other species.
277. Population ecology is an important area because it (i) ecology to population genetics and (ii). Identify (i) and (ii) in the above statement and select the correct option.
- |               |           |
|---------------|-----------|
| a)            |           |
| (i)           | (ii)      |
| distinguishes | evolution |
- |               |            |
|---------------|------------|
| b)            |            |
| (i)           | (ii)       |
| distinguishes | biogenesis |
- |      |           |
|------|-----------|
| c)   |           |
| (i)  | (ii)      |
| link | evolution |
- |       |            |
|-------|------------|
| d)    |            |
| (i)   | (ii)       |
| links | biogenesis |
278. The Pyramid of numbers in grassland ecosystem will be -  
 a) Up right b) Inverted c) Irregular d) Linear
279. Refer to the given flow chart.
- ```

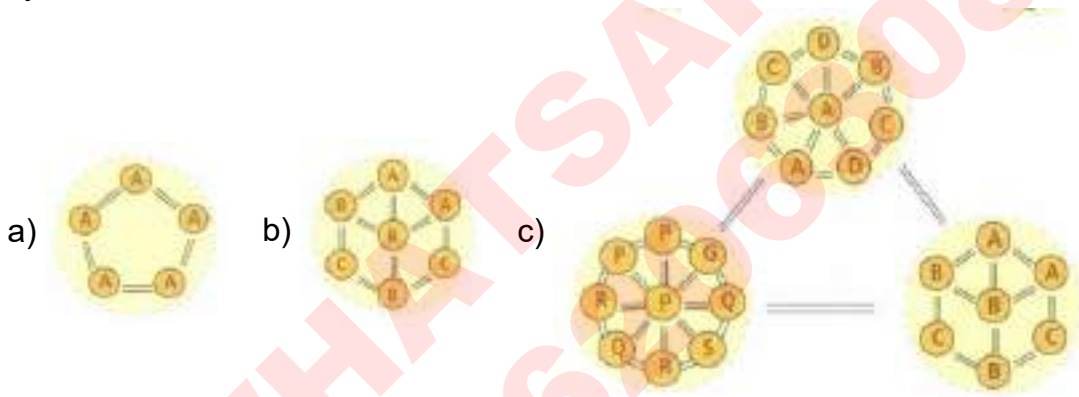
graph LR
  A[Individuals] --> B[Populations]
  B --> C[X]
  
```
- Identify X and select the correct option
 a) Communities b) Biospheres c) Biomes d) Species
280. The age structure of a population influences population growth because
 a) younger females have more offsprings than do older females
 b) different age groups have different reproductive capabilities
 c) more is the number of immature individuals, slower is the growth of population
 d) a shorter generation time results in slower population growth.
281. If most individuals in a population are young, why is the population likely to grow rapidly in the future?

- a) Many individuals will begin to reproduce soon b) Death rates will be low
c) Immigration and emigration can be ignored d) All of these
282. Deserts, rainforest, tundra, etc, are examples of
a) community b) biome c) ecosystem d) population
283. Large woody vines are more commonly found in _____.
a) temperate forest b) mangroves c) tropical rainforests d) alpine forests
284. People who have migrated from the plains to an area adjoining Rohtang Pass about six months back
a) Suffer from altitude sickness with symptoms like nausea, fatigue, etc
b) Have the usual RBC count but their haemoglobin has very high binding affinity to O₂
c) Have more RBCs and their haemoglobin has a lower binding affinity to O₂
d) Are not physically fit to play games like football
285. Which of the following does not have stomata?
a) Hydrophytes b) Mesophytes c) Xerophytes d) Submerged hydrophytes
286. An inhabitant of Varanasi goes to Rohtang and experiences nausea, fatigue and heart palpitations. It is because
a) he is experiencing altitude sickness b) his RBC count is lower than required
c) he is in an area of low atmospheric pressure d) all of these
287. Which one of the following pairs is mismatched?
a) Tundra - permafrost b) Savanna - acacia trees c) Prairie - epiphytes
d) Coniferous forest - evergreen trees
288. Which statement is not related to S-shaped population curve?
a) Environmental resistance suddenly become effective
b) Exponential phase is followed by decline phase
c) Mass mortality and population crash occurs d) Both (1) & (3)
289. Which of the following is a partial root parasite?
a) Sandal wood b) Mistletoe c) Orobanche d) Ganoderma
290. Characteristics of a terrestrial biome are strongly influenced by its
a) fauna b) all of these c) flora d) climate
291. The population growth is generally described by the following equation
$$\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$$

What does 'r' represent in the given equation?
a) Population density at time 't' b) Intrinsic rate of natural increase c) Carrying capacity
d) The base of natural logarithm
292. In 2005, for each of the 14 million people present in a country, 0.028 were born and 0.008 died during the year. Using exponential equation, the number of people present in 2015 is predicted as:
a) 25 millions b) 17 millions c) 20 millions d) 18 millions
293. Keystone species in an ecosystem are those which _____.

- a) are present in maximum number b) are most frequent c) attain a large biomass
d) contribute to ecosystem properties
294. Green house effect mainly due to -
a) SO_2 b) CO_2 c) CO d) O_2
295. Path of energy flow in an ecosystem is:
a) Herbivorous \rightarrow producer \rightarrow carnivorous \rightarrow decomposer
b) Herbivorous \rightarrow carnivorous \rightarrow producer \rightarrow decomposer
c) Producer \rightarrow carnivorous \rightarrow herbivorous \rightarrow decomposer
d) Producer \rightarrow herbivorous \rightarrow carnivorous \rightarrow decomposer
296. The interaction of species with the environment is known as
a) Ecosystem b) Autecology c) Synecology d) Community
297. An urn shaped population age pyramid represents
a) growing population b) static population c) declining population d) extinct population
298. _____ occurs in equatorial regions where rainfall and ones. warmth are abundant, while _____ biomes lacks rain.
a) Desert, temperate b) Tropical rain forest, desert c) Tundra, savannah
d) Desert, chapparal
299. For which of the following cases, population density can be easily determined by utilising non-biological parameter?
a) Fish density b) Density of bacteria in culture plate
c) Siberian cranes at Bharatpur wetlands d) Tiger census
300. A large regional unit characterised by a specific flora and fauna is called
a) Biome b) Biosphere c) Ecosystem d) Landscape
301. Which one of the following population interactions is widely used in medical science for the production of antibiotics?
a) Parasitism b) Mutualism c) Commensalism d) Amensalism
302. The phenomenon when organisms resembling others for escaping from enemies is _____.
a) adaptation b) mimicry c) homology d) analogy
303. Assertion: The community of an ecotone commonly contains the organisms of each of the overlapping communities and in addition the organisms which are restricted to the ecotone.
Reason: The tendency for increased variety and density at community junctions is known as the edge effect.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
304. Which of the following are likely to be present in deep sea water?
a) Eubacteria b) Blue-green algae c) Saprophytic fungi d) Archaeobacteria
305. A good soil is that which

- a) Allows little water to enter in it b) Allows extra water to percolate slowly
c) Holds water entering it d) Allows water to pass through it quickly
306. An orchid resembling the female of an insect, so as to be able to get pollinated is due to the phenomenon of _____.
a) mimicry b) pseudocopulation c) pseudo pollination d) pseudo parthenocarpy
307. When the growth rate of a population following the logistic model equals zero? The logistic model is given as $dN/dt = rN(K - n/K)$
a) When N/K is exactly one b) When N nears the carrying capacity of the habitat
c) When N/K equals zero d) When death rate is greater than birth rate
308. The source of energy in an ecosystem is -
a) Sunlight b) DNA c) ATP d) RNA
309. What is the salinity (part per thousand) of hypersaline lagoons
a) 5 b) 30 - 35 c) More than 100 d) Less than 50
310. If A, B, C, D, G, P, Q, R and S represent different species, then which of the following figures symbolises a biome?



- d) None of these
311. Percentage of individuals of a given age group in a given population is called as
a) age distribution b) age density c) age graph d) age curve
312. Which of the following is a correct pair?
a) Cuscuta - parasite b) Dischidia - insectivorous c) Opuntia - predator
d) Capsella - hydrophyte
313. Assertion: Bell shaped age pyramid represents a stable population.
Reason : In a stable population, proportion of individuals in reproductive age group is higher than the individuals in pre-reproductive age group.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
314. Which of the following is not true for a species?
a) Members of a species can interbreed.
b) Gene flow does not occur between the populations of a species.

- c) Each species is reproductively isolated from every other species.
d) Variations occur among members of a species.
315. Which is normally not an air pollutant -
a) CO b) SO₂ c) Hydrocarbon d) CO₂
316. _____ is an attribute of the organism (morphological, physiological, behavioural) to survive and reproduce in its habitat.
a) Migration b) Hibernation c) Adaptation d) Homeostasis
317. Mango trees do not and cannot grow in temperate regions. The most important environmental factor responsible for it is:
a) soil b) temperature c) water d) light
318. Eutrophication refers to -
a) High production in an aquatic ecosystem b) Low production in an aquatic ecosystem
c) Low production in a terrestrial d) Stable production in a terrestrial ecosystem
319. Assertion: Predators maintain species diversity.
Reason: Predators reduce the intensity of competition among competing prey species.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
320. The sum total of the population of the same kind of organisms constitute.
a) colony b) genus c) community d) species
321. Which of the following factors has a negative effect on the population growth rate?
a) Emigration b) Immigration c) Natality d) Fecundity
322. A fertile agricultural soil appears dark coloured at the surface as compared to soil one metre down. The reason for colour of topsoil is _____.
a) more moisture b) rich in organic matter c) rich in iron, calcium and magnesium
d) recent formation
323. Lichens are the associations of
a) bacteria and fungus b) algae and bacterium c) fungus and algae d) fungus and virus
324. Pollution can be controlled by -
a) Sewage treatment b) Checking atomic blasts
c) Manufacturing electrically operated vehicles d) All the above
325. Which of the following cannot be used by prey for defence against predator
a) Cardiac glycosides b) Strychnine c) Nectar d) Quinine
326. Which of the following statements is correct?
a) Geometric growth produces J-shaped population growth curve
b) Logistic growth occurs when resources are limiting.
c) Equation for exponential growth is $N_t = N_0 e^{rt}$. d) All of these
327. Two plants can be conclusively said to belong to the same species if they _____.

- a) have more than 90 percent similar genes.
- b) look similar and possess identical secondary metabolites.
- c) have same number of chromosomes.
- d) can reproduce freely with each other and fiber seeds.

328. When organisms change their location to escape from harsh environment, it is called as
 a) hibernation b) vernalisation c) migration d) aestivation

329. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Eurythermal	(i) Able to tolerate narrow range of temperature
B. Stenothermal	(ii) A stage of suspended development
C. Conformers	(iii) Body temperature changes with ambient temperature
D. Diapause	(iv) Able to tolerate wide range of temperature

- a) A-(iv), B-(i), C-(iii), D-(ii) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(ii), B-(iv), C-(iii), D-(i)
- d) A-(i), B-(ii), C-(iii), D-(iv)

330. Select the mismatch:

- a) Rhodospirillum - Mycorrhiza b) Anabaena - Nitrogen fixer c) Rhizobium - Alfalfa
- d) Frankia - Alnus

331. Father of Indian Ecology is

- a) Odum b) Haeckel c) Tansley d) R.Misra

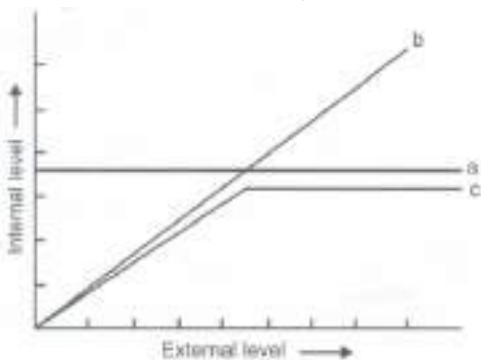
332. Consider the following four conditions (i) - (iv) and select the correct pair about desert lizards.

- (i) Burrowing in soil to escape high temperature
 - (ii) Losing heat rapidly from the body during high temperature
 - (iii) Bask in the sun when the temperature is low
 - (iv) Insulating body due to thick fatty dermis
- a) (i) and (iv) b) (i) and (ii) c) (iii) and (iv) d) (i) and (iii)

333. Which of the following alternative used by zooplanktons to overcome partial stressful conditions

- a) Migration b) Diapause c) Hibernation d) Aestivation

334. This is a diagrammatic representation of response of organisms to biotic. What do a, b, c represent respectively.



- a) Partial regulator, conformer b) Regulator, conformer, partial regulator
- c) Conformer, regulator, partial regulator d) Regulator, partial conformer, regulator

335. Which is not an effect of competition?

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- a) Regulation of population size b) Generalization of niche
- c) Establishment of social hierarchy d) Help in speciation

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Time : 1 Mins

ECOSYSTEM 1

Marks : 1000

1. Which one of the following exhibits least productivity?
a) Salty marshes b) Grasslands c) Open oceans d) Coral reefs
2. Stratification is well developed in
a) Tropical rain forests b) Grasslands c) Alpine vegetations d) Temperate forests
3. Approximately how much of the solar energy that falls on the leaves of a plant is converted to chemical energy by photosynthesis?
a) Less than 1% b) 2-10% c) 30% d) 50%
4. **Assertion:** In a marine aquatic ecosystem, the biomass of phytoplanktons (producers) at any given time, is lower than the biomass of zooplanktons (primary consumers).
Reason: Phytoplanktons are consumed almost as rapidly as they are formed and thus have shorter life spans.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
5. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Bacteria	(i) Pisere
B. Green plants	(ii) Transducers
C. Primary succession	(iii) Lithosere
D. Succession on bare rock	(iv) Micro-consumers

a) A-(iv), B-(ii), C-(i), D-(iii) b) A-(iv), B-(iii), C-(i), D-(ii) c) A-(i), B-(iii), C-(ii), D-(iv)
d) A-(iv), B-(ii), C-(iii), D-(i)
6. Energy requirement for maintenance of body _____ with successively higher trophic level.
a) Decreases b) Increases c) Remains same d) Always 10%
7. Secondary productivity is rate of formation of new organic matter by _____.
a) Parasite b) Consumer c) Decomposer d) Producer

8. During biological nitrogen fixation, inactivation of nitrogenase by oxygen poisoning is prevented by : _____.
a) Xanthophyll b) Carotene c) Cytochrome d) Leghemoglobin
9. During ecological succession: _____.
a) the establishment of a new biotic community is very fast in its Primary Phase.
b) the numbers and types of animals remain constant.
c) _____
the changes lead to a community that is in near equilibrium with the environment and is called pioneer community.
d) the gradual and predictable change in species composition occurs in a given area.
10. Amount of living material and nutrients present in different trophic levels and soils at any given time are called respectively
a) Standing sate and standing crop b) Standing crop and standing state
c) Standing state and standing quality d) Biomass and standing crop
11. Which of the following processes does not contribute to the CO_2 pool in the atmosphere?
a) Respiration by producers b) Photosynthesis by producers
c) Respiration by consumers d) Decomposition by decomposers
12. **Assertion:** Amount of organic matter synthesised by producers per unit time and per unit area during the process of photosynthesis is referred to as net primary productivity.
Reason: Primary productivity is usually high and sustained throughout the year in temperate areas due to abundance of sunlight.
a) _____
If both assertion and reason are true and reason is the correct explanation of assertion.
b) _____
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
13. Which of the following ecological pyramids can be both upright and inverted?
a) Pyramid of number b) Pyramid of biomass c) Pyramid of energy
d) Both (1) & (2)
14. About 70% of total global carbon is found in _____.
a) grasslands b) agro ecosystems c) oceans d) forests
15. Which of the following is not a characteristic of humus?
a) It is rich in organic matter such as lignin and cellulose.
b) It is colloidal in nature and serves as a reservoir of nutrients.
c) It is highly resistant to microbial action and undergoes slow decomposition.
d) It is further degraded by the process of humification.
16. Correct sequence of stages of succession on a bare rock is

- a) Lichens → Mosses → Grasses → Shrubs → Trees
b) Trees → Shrubs → Lichens → Mosses → Grasses
c) Mosses → Shrubs → Trees → Lichens → Grasses
d) Mosses → Lichens → Grasses → Shrubs → Trees.
17. The seral changes in previously sterile or total barren area is called
a) Climatic climax b) Secondary succession c) Primary succession d) Sere
18. Which of the following is the most stable ecosystem?
a) Forest b) Desert c) Mountain d) Ocean
19. Earth is a/an
a) Open system b) Closed system c) Both (1) & (2) d) None of these
20. The mass of living material at a trophic level at a particular time is called _____.
a) Standing state b) Net primary productivity c) Standing crop
d) Gross primary productivity

21. Select the option that correctly identifies A, B and C in the given table

Organism	Trophic	Food Chain
Eagle	A	Grazing
Earthworm	Primary consumer	B
Frog	C	Grazing

a)

A	B	C
Top carnivore	Detritus	Secondary consumer

b)

A	B	C
Top carnivore	Detritus	Primary consumer

c)

A	B	C
Secondary consumer	Grazing	Secondary consumer

d)

A	B	C
Scavenger	Grazing	Producer

22. **Assertion:** In nature, the recycling of carbon is essentially a self-regulating feedback system.

Reason: The reservoir pool of carbon consists of free CO₂ in the atmosphere.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

23. Given below are some of the stages of the hydrarch.

- A. Marsh - meadow stage
B. Reed-swam stage
C. Submerged plant stage
D. Phytoplankton stage
E. Free floating plant stage

Select the option that represents the correct sequence of these stages.

- a) $D \rightarrow C \rightarrow E \rightarrow B \rightarrow A$ b) $C \rightarrow E \rightarrow A \rightarrow B \rightarrow D$ c) $B \rightarrow D \rightarrow C \rightarrow A \rightarrow E$
d) $D \rightarrow E \rightarrow C \rightarrow B \rightarrow A$

24. During the process of ecological succession, the changes that take place in communities are

- a) orderly and sequential b) random c) very quick
d) not influenced by the physical environment

25. Pick up the correct statements regarding food chain

- (i) Removal of 80 tigers resulted in greatly increased growth of vegetation
(ii) Removal of most of the carnivores resulted in increased population of deer
(iii) Length of food chain is generally limited to 3 - 4 trophic levels due to energy loss
(iv) Length of food chain may vary from 2 - 8 trophic levels
- (i) Removal of 80 tigers resulted in greatly increased growth of vegetation
a) (ii) Removal of most of the carnivores resulted in increased population of deer
 (ii) Removal of most of the carnivores resulted in increased population of deer
b) (iii) Length of food chain is generally limited to 3 - 4 trophic levels due to energy loss
 (iii) Length of food chain is generally limited to 3 - 4 trophic levels due to energy loss
c) (iv) Length of food chain may vary from 2 - 8 trophic levels
 (i) Removal of 80 tigers resulted in greatly increased growth of vegetation
d) (iv) Length of food chain may vary from 2 - 8 trophic levels

26. The sequence of communities of primary succession in water is

- a)
phytoplankton, sedges, free-floating hydrophytes, rooted hydrophytes, grasses and trees
- b)
phytoplankton, free-floating hydrophytes, rooted hydrophytes, sedges, grasses and trees
- c)
free-floating hydrophytes, sedges, phytoplankton, rooted hydrophytes, grasses and trees
- d)
phytoplankton, rooted submerged hydrophytes, floating hydrophytes, reed swamp, sedges, meadow and trees.

27. Read the given statements and select the correct option.

Statement 1: Major reservoirs of phosphorus are phosphate rocks and fossil bone deposits laid down in the past geological ages.

Statement 2: During weathering of rocks, minute amounts of these phosphates dissolve in soil solution and are absorbed by the roots of the plants.

- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct.

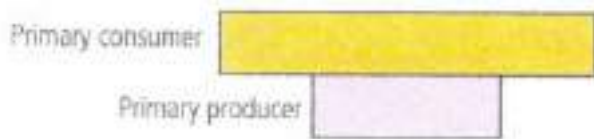
d) Both statements 1 and 2 are incorrect

28. Which of the following organisms in the given food web act as a secondary consumers?



a) II and V b) III and VI c) III and IV d) V and VII

29. Which kind of pyramid is represented by the given figure?



a) Pyramid of numbers in terrestrial ecosystem

b) Pyramid of biomass in terrestrial ecosystem

c) Pyramid of biomass in aquatic ecosystem

d) Pyramid of numbers in aquatic ecosystem

30. Read the given statements and select the correct option.

Statement 1: Net primary productivity is less than the gross primary productivity.

Statement 2: Net primary productivity is equal to the gross primary productivity minus the respiration losses.

a) Both statements 1 and 2 are correct.

b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect.

31. Study the given flow chart and select the correct statements regarding this.



(i) It represents phosphorus cycling in a terrestrial ecosystem.

(ii) It represents phosphorus cycling in an aquatic ecosystem.

(iii) Natural reservoir of phosphorus is phosphate rocks.

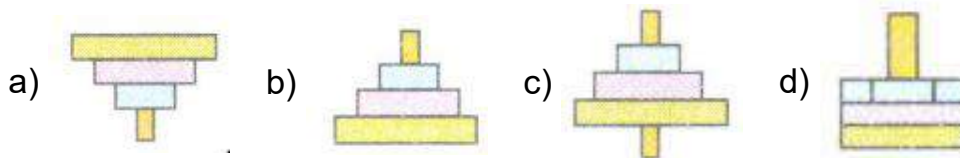
(iv) There is no respiratory release of phosphorus into atmosphere.

(v) Gaseous exchange of phosphorus between organisms and environment occurs to a considerable extent.

a) (i), (ii) and (v) b) (i), (iii) and (iv) c) (ii), (iii) and (iv) d) (i), (iii), (iv) and (v)

32. Decomposers are also called as
a) transducers b) reducers c) micro-consumers d) both (b) and (c).
33. Which of the following is expected to have the highest value ($\text{gm/m}^2/\text{yr}$) in a grassland ecosystem?
a) Secondary Production b) Tertiary Production c) Gross Production (Gp)
d) Net Production (NP)
34. Read the given statements and select the correct option.
Statement 1: In an aquatic ecosystem, pyramid of biomass is inverted.
Statement 2: Biomass depends upon reproductive potential and longevity of individuals
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect
35. A food web
a) Decreases variety of food but increases quantity of food at each trophic level
b) Increases variety as well as quantity of food at each trophic level
c) Increases variety of food at each trophic level
d) Can be depicted by ecological pyramid
36. Pick up the correct food chain.
a) Grass \rightarrow Chameleon \rightarrow Insect \rightarrow Bird b) Grass \rightarrow Fox \rightarrow Rabbit \rightarrow Bird
c) Phytoplankton \rightarrow Zooplankton \rightarrow Fish d) Fallen leaves \rightarrow Bacteria \rightarrow Insect larvae
37. Second most important trophic level in a lake is _____.
a) neuston b) zooplankton c) phytoplankton d) benthos
38. Select the pairs of sedimentary biogeochemical cycles.
I. Hydrogen cycle and water cycle
II. Phosphorus cycle and sulphur cycle
III. Calcium cycle and magnesium cycle
IV. Carbon cycle and nitrogen cycle
a) I and II b) II and III c) III and IV d) I and IV
39. Among the following, where do you think the process of decomposition would be the fastest?
a) Tropical rainforest b) Antarctic c) Dry arid region d) Alpine region
40. In tropical rain forest, most of the energy in ecosystem flows through
a) Grazing food chain b) Detritus food chain c) Parasitic food chain
d) Both (1) & (3)
41. Which of the following pair is a sedimentary type of biogeochemical cycle?
a) Oxygen and nitrogen b) Phosphorous and sulphur c) Phosphorous and nitrogen
d) Phosphorus and carbon dioxide

42. Which of the following representations shows the pyramid of numbers in a forest ecosystem?



43. Which one of the following aspects is not a component of functional unit of ecosystem?

- a) Productivity b) Decomposition c) Energy flow d) Ecological pyramids

44. For net primary productivity energy captured is

- a) 1-5% of incident radiation b) 2 - 5% of PAR c) 0.8 - 4% of incident radiation
d) 2 - 10% of PAR

45. Select the correct sequence of succession in a pond

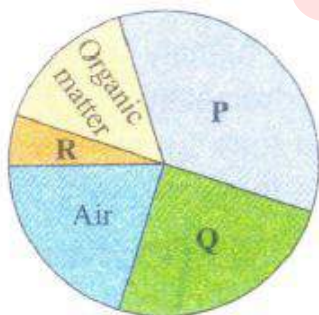
- a) Submerged plants → Floating plants → Reed swamp stage → Sedges
b) Floating plants → Submerged plants → Reed swamp stage → Sedges
c) Reed swamp stage → Sedges → Floating plants → Submerged plants
d) Sedges → Reed swamp stage → Floating plants → Submerged plants

46. Match the trophic levels with their correct species examples in grassland ecosystem.

Column I	Column - II
(a) Fourth trophic level	(i) Crow
(b) Second trophic level	(ii) Vulture
(c) First trophic level	(iii) Rabbit
(d) Third trophic level	(iv) Grass

- a) (iv) (iii) (ii) (i) b) (i) (ii) (iii) (iv) c) (ii) (iii) (iv) (i) d) (iii) (ii) (i) (iv)

47. The given pie diagram represents different components of the soil. Identify P, Q and R and select the correct option.



a)

P	Q	R
Water	Biota	Mineral salts

b)

P	Q	R
Mineral salts	Biota	Water

c)

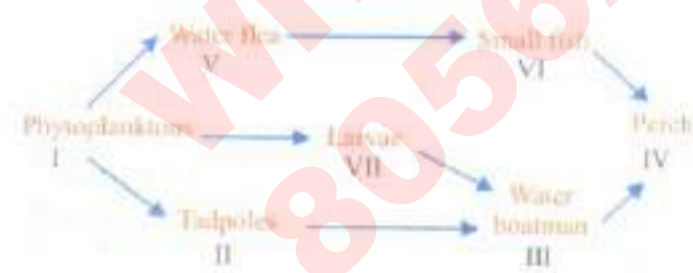
P	Q	R
Mineral salts	Water	Biota

d)

P	Q	R
Biota	Water	Mineral salts

48. Which one of the following processes during decomposition is correctly described _____.
- a) Humification-Leads to the accumulation of a dark coloured substance humus which undergoes microbial action at every fast rate.
 - b) Catabolism-Last step decomposition under fully anaerobic condition.
 - c) Leaching-Water soluble inorganic nutrients rise to the top layers of soil.
 - d) Fragmentation-Carried out by organisms such as earthworm
49. The terminal stage of a successional process is called
- a) Ecesis stage b) Climax stage c) Seral stage d) Pioneer stage
50. If the pioneer stage is dominated by autotrophs then the succession is called
- a) Allogenic b) Autogenic c) Autotrophic d) Heterotrophic
51. If the forest cover is reduced to half, what is most likely to happen on a long basis?
- a) Tribals living in these areas will starve to death
 - b) Cattle in these and adjoining areas will die due to lack of fodder
 - c) Large areas will become deserts
 - d) Crop breeding programmes will suffer due to a reduced availability of variety of germplasm
52. Trophic level of man in ecosystem is/may be
- a) First b) Second only c) Third only d) Fourth
53. As the succession proceeds number and types of _____ change.
- a) vegetation b) animals c) vegetation and animals
 - d) vegetation, animals and decomposers
54. Mr. X is eating curd/yoghurt. For this food intake in a food chain he should be considered as occupying
- a) first trophic level b) second trophic level c) third trophic level
 - d) fourth trophic level.
55. Rate of decomposition depends upon
- a) chemical composition of detritus b) temperature c) soil moisture and soil pH
 - d) all of these.
56. In lithosere, foliose lichens make the conditions favourable for the growth of
- a) crustose lichens b) mosses c) annual grasses d) perennial grasses
57. Which one of the following animals may occupy more than one trophic levels in the same ecosystem at the same time?
- a) Sparrow b) Lion c) Goat d) Frog
58. Which of the following are called key industry animals?
- a) Autotrophs b) Decomposers c) Herbivores d) Top carnivores

59. **Assertion:** Herbivores are also called as key industry animals because they convert plant matter into animal matter.
Reason: Decomposers play a pivotal role in the ecosystem and they indirectly support the producers.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false d) If both assertion and reason are false
60. **Assertion:** Crustose lichens, in a lithosere, secrete organic acids causing the weathering of rocks so that minerals essential for proper growth of lichens are released.
Reason: Early colonists in a primary succession are usually lichens, which suggests that colonisation is easier when an organism has a mutualistic association.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false
61. Which of the following organisms in the given food web act both as a predator and a prey?



- a) I, II and IV b) II, III and V c) II, III, V, VI and VII d) II, III and VI
62. **Assertion:** Temperature and soil moisture are the important climatic factors that regulate the process of decomposition.
Reason: Warm and moist environment favours decomposition whereas low temperature and anaerobiosis inhibit decomposition.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false

63. **Assertion:** Primary succession occurs over a primarily bare area where there was no living matter from the very beginning.

Reason: During primary succession, reproductive structures of the previous occupants give rise to a new seral community as soon as the conditions become favourable.

a)

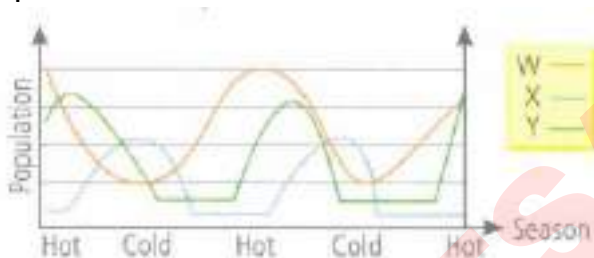
If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

64. The graph given below shows the variations in the populations of producers, primary consumers and secondary consumers as well as the amount of dissolved mineral salts in a pond.



Which one of the following correctly matches each graph?

a)

Producer population	Primary consumer population	Secondary consumer population
X	Y	W

b)

Producer population	Primary consumer population	Secondary consumer population
W	X	Y

c)

Producer population	Primary consumer population	Secondary consumer population
W	Y	X

d)

Producer population	Primary consumer population	Secondary consumer population
X	W	Y

65. The rate of secondary succession is faster than primary succession because

a) soil or sediment is already present b) water is available in large quantity

c) climax community is already present d) pH of soil is favourable

66. Among the following biogeochemical cycles, which one does not have losses due to respiration?

a) Phosphorus b) Nitrogen c) Sulphur d) All of the above

67. **Assertion:** Sedimentary nutrient cycles of phosphorus, calcium, magnesium, etc., are considered as imperfect cycles.

Reason: These cycles get more easily disrupted by local disturbances as the bulk of material remains in the relatively inactive and immobile reservoir on the earth's crust.

- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
68. The primary succession refers to the development of communities on a _____.
a) freshly cleared crop field b) forest clearing after devastating fire
c) pond, freshly filled with water after a dry phase
d) newly-exposed habitat with no record of earlier vegetation
69. In a terrestrial ecosystem such as forest, maximum energy is in which trophic level?
a) T_1 b) T_2 c) T_3 d) T_4
70. **Assertion:** Oceans are a low productivity ecosystems despite occupying about 70% of the earth's surface.
Reason: In aquatic ecosystems, productivity is limited by light which decreases with increasing water depth.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false
71. Climax community is in a state of
a) non-equilibrium b) equilibrium c) disorder d) constant change
72. An orderly sequence of community development on an area is called
a) Succession b) cover c) Establishment d) Diversity
73. Ten percent law of energy transfer in a food chain was given by
a) Elton b) Lindeman c) Haeckel d) Schimper
74. The upright pyramid of number is absent in _____.
a) Pond b) Forest c) lake d) Grass
75. During the stages of succession in a given ecosystem, the following changes in characteristics may be observed.

	Characteristic	Stages in ecosystem development	
		Early	Late
A.	Total organic matter	Low	High
B.	Species diversity	Low	High
C.	Size of organism	Small	Large
D.	Productivity	Low	High
E.	Food chains	Short	Long

Which one of the characteristics, A, B, C, D or E is responsible for the apparent high degree of stability associated with a climax ecosystem?

- a) B b) D c) A d) E

76. Which one of the following is not a function of an ecosystem?

- a) Energy flow b) Decomposition c) Productivity d) Stratification

77. Which of the following is most important in water cycle?

- a) Transpiration through leaves b) Evaporation from the oceans
c) Percolation of water into the ground d) Absorption of capillary water by plants

78. Niche is _____.

- a) the range of temperature that the organism needs to live.
b) the physical space where an organism lives.
c) all the biological factors in the organisms environment.
d) the functional role played by an organism where it lives.

79. Which of the following is an ecosystem service provided by a natural ecosystem?

- a) Cycling of nutrients b) Prevention of soil erosion
c) Pollutant absorption and reduction of the threat of global warming
d) All of the above

80. The given graph shows the productivity of an aquatic ecosystem measured in terms of dissolved oxygen produced and consumed by green plants and photosynthetic algae where PS = photosynthesis and R = respiration



What will happen during the algal bloom?

- a) PS will be increased, R will be decreased.
b) PS will be decreased, R will be increased. c) PS and R will not change.
d) PS + R will increase.

81. Percentage of photosynthetically active radiation (PAR) in the incident solar radiation is:

- a) 1 - 5% b) 2 - 10% c) less than 50% d) approx. 100%.

82. The breakdown of detritus into small particles by earthworm is a process called :

- a) Mineralization b) Catabolism c) Humification d) Fragmentation

83. Which one of the following is the most productive ecosystem?

- a) Temperate forest b) Grassland c) Desert d) Tropical rainforest

84. The importance of ecosystem lies in

- a) Flow of energy b) Cycling of materials c) Both (1) & (2) d) Consumers

85. **Assertion:** Aquatic herbivores are usually more productive as compared to terrestrial herbivores.

Reason: Phytoplanktons achieve faster growth rate and are more nutritious to heterotrophs than their terrestrial counterparts due to their small size and lack of structural tissues.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false

86. In a biotic community, the primary consumers are _____.

a) carnivores b) omnivores c) detritivores d) herbivores

87. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Gross primary productivity	(i) Green plants
B. Secondary productivity	(ii) Rate of synthesis of organic matter by consumers
C. Transducers	(iii) Total organic matter produced from solar energy
D. Food web	(iv) Interconnection of food chains

a) A - (i), B - (ii), C - (iii), D - (iv) b) A - (iii), B - (ii), C - (i), D - (iv)

c) A - (iii), B - (iv), C - (i), D - (ii) d) A - (ii), B - (i), C - (iv), D - (iii)

88. Which of the following is considered as pioneer community in xerarch?

a) Annual herbs b) Perennial herbs c) Shrubs d) Lichens

89. The given pyramid best represents



- a) pyramid of energy in forest ecosystem b) pyramid of biomass in forest ecosystem
c) pyramid of numbers in grassland ecosystem
d) pyramid of numbers in forest ecosystem.

90. Match column I with column II and choose the correct option from the given codes.

Column I	Column II
A. Population	(i) Part of the earth consisting of all the ecosystems of the world
B. Community	(ii) Assemblage of all the individuals belonging to different species occurring in an area

C. Ecosystem	(iii) Group of similar individuals belonging to the same species, found in an area
D. Ecosphere	(iv) Interaction between the living organisms and their physical environment
	(v) Classification of organisms based on the type of environment

- a) A-(iii), B-(ii), C-(i), D-(v) b) A-(iv), B-(v), C-(iii), D-(i) c) A-(ii), B-(iii), C-(i), D-(iv)
d) A-(iii), B-(ii), C-(iv), D-(i)

91. Which of the following is not a producer?

- a) Spirogyra b) Agaricus c) Volvox d) Nostoc

92. Presence of plants arranged into well defined vertical layers depending on their height can be seen in :

- a) Tropical Savannah b) Tropical rain Forest c) Grassland d) Temperate Forest

93. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Gross primary productivity	(i) Self-sustainable ecosystem
B. Net primary productivity	(ii) Aquatic ecosystem
C. Pond	(iii) O ₂ requiring process
D. Aquarium	(iv) Photosynthetic production
E. Decomposition	(v) Available to secondary consumers

- a) A - (iv), B - (ii), C - (i), D - (iii), E - (v) b) A - (iv), B - (v), C - (i), D - (ii), E - (iii)
c) A - (i), B - (iii), C - (ii), D - (iv), E - (v) d) A-(ii), B - (i), C - (iii), D - (v), E - (iv)

94. Major source of sulphur is

- a) oceans b) land c) rocks d) lakes

95. Given figure represents two food chains (X and Y) linked together to form a food web.



Identify the types of food chains X and Y and the organism A that interconnects these food chains.

a)

X	Y	A
Detritus food chain	Grazing food chain	Bacterium

b)

X	Y	A
Detritus food chain	Grazing food chain	Detritivore

c)

X	Y	A
Grazing food chain	Detritus food chain	Detritivore

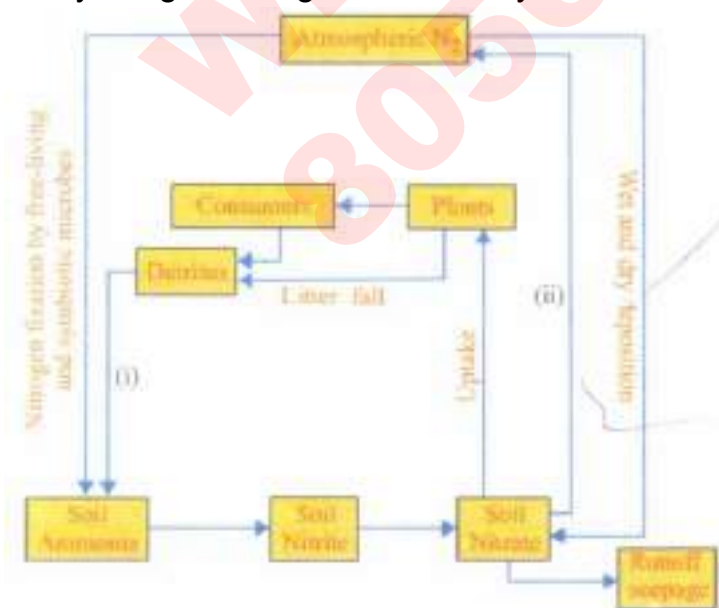
d)

X	Y	A
Grazing food chain	Detritus food chain	Grasshopper

96. _____ is the rate of production of organic matter by consumers.
 a) Primary productivity b) Secondary productivity c) Net primary productivity
 d) Gross primary productivity
97. Organisms which are associated with first as well as third trophic level are
 a) macrophytes b) phytoplanktons c) chemoautotrophs d) insectivorous plants
98. Of the total incident solar radiation the proportion of PAR is:
 a) More than 80% b) About 70% c) About 60% d) Less than 50%
99. An inverted pyramid of biomass can be found in which ecosystem?
 a) Forest b) Marine c) Grassland d) Tundra
100. **Assertion:** The loss of biologically useful energy as heat with every energy transfer in a food chain is a consequence of the second law of thermodynamics.
Reason: Energy does not remain trapped permanently in any organism, it is either passed on to higher trophic level or becomes available to detritivores and decomposers after the organism dies.
- a)
 If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false
101. Which one of the following statements is correct for secondary succession?
 a) It is similar to primary succession except that it has a relatively fast pace
 b) It begins on a bare rock. c) It occurs on a deforested site
 d) It follows primary succession
102. Food chain in which microorganisms breakdown the food formed by primary producers are _____.
 a) parasitic food chain b) detritus food chain c) consumer food chain
 d) predator food chain
103. If 10 joules of energy is available at the producer level, then amount of energy present at the level of secondary consumers is
 a) 10 J b) 1 J c) 0.1 J d) 0.01 J
104. Which one of the following would appear as the pioneer organisms on bare rocks?
 a) Green algae b) Lichens c) Liverworts d) Mosses

105. In grass-deer-tiger food chain, grass biomass is one tonne. The tiger biomass shall be _____.
a) 100 kg b) 10 kg c) 200 kg d) 1 kg
106. Which is not a characteristic of seral stages?
a) Simplified food chain b) Few and generalized niches
c) Low net community productivity d) Low energy use efficiency
107. In relation to Gross primary productivity and Net primary productivity of an ecosystem. Which one of the following statements is correct?
a) Gross primary productivity and Net primary productivity are one and same.
b)
There is no relationship between Gross primary productivity and Net primary productivity
c) Gross primary productivity is always less than Net primary productivity.
d) Gross primary productivity is always more than Net primary productivity.
108. Study the following statements and select the incorrect ones
(i) Pyramids of energy and yearly biomass production can never be inverted, since this would violate the laws of thermodynamics.
(ii) Pyramids of standing crop and numbers can be inverted, since the number of organisms at a time does not indicate the amount of energy flowing through the system.
(iii) There are certain limitations of ecological pyramids such as they do not take into account the same species belonging to two or more trophic levels.
(iv) Saprophytes are not given any place in ecological pyramids even though they play a vital role in the ecosystem.
a) (i) and (ii) b) (iii) and (iv) c) (ii) and (iii) d) None of these
109. What type of ecological pyramid would be obtained with the following data? Secondary consumer: 120g, Primary consumer: 60g Primary producer: 10 g.
a) Upright pyramid of numbers b) Pyramid of energy c) Inverted pyramid of biomass
d) Upright pyramid of biomass
110. The nature of climax community ultimately depends on _____.
a) climate b) bed rock c) soil organisms d) pool of available nutrients
111. Secondary Succession takes place on/in: _____.
a) Degraded forest b) Newly created pond c) Newly cooled lava d) Bare rock
112. The highest net annual productivity occurs in :
a) Tropical rain forests b) Tropical deciduous forests c) Temperate evergreen forests
d) Temperate deciduous forests
113. What is true of ecosystem?
a) Primary consumers are least dependent upon producers
b) Primary consumers out-number producers
c) Producers are more than primary consumers
d) Secondary consumers are the largest and most powerful

114. Pheretima and its close relatives derive nourishment from: _____.
a) sugarcane roots b) decaying fallen leaves and soil organic matter. c) soil insects
d) small pieces of fresh fallen leaves of maize, etc.
115. Xeric environment is characterised by _____.
a) precipitation b) low atmospheric humidity c) extreme of temperature
d) high rate of vapourisation
116. The function of reservoir pool is to meet with the deficit of nutrient that occurs due to
a) imbalance in rate of efflux and influx of nutrients b) only efflux of nutrients
c) ceased nutrient cycle d) none of these
117. Succession stages that occur on a bare rock are called
a) Psammosere b) Hydrosere c) Lithosere d) Halosere
118. The phosphates remain outside the natural cycle for a long time
a) When they form compounds with metals
b) When they are incorporates in bone and teeth
c) When the bodies of the organisms excrete and decompose d) Both (1) & (2)
119. Both, hydrarch and xerarch successions lead to _____.
a) medium water conditions b) xeric conditions c) highly dry conditions
d) excessive wet conditions
120. Pyramid of number deals with number of _____.
a) species in an area b) individuals in a community c) individuals in a trophic level
d) sub-species in a community
121. Study the given biogeochemical cycle and identify the steps (i) and (ii).



a)

(i)	(ii)
Ammonification	Denitrification

b)

(i)	(ii)
Denitrification	Ammonification

c)

(i)	(ii)
Nitrification	Ammonification

d)

(i)	(ii)
Ammonification	Nitrification

122. The response of different organisms to the environmental rhythms of light and darkness is called _____.

- a) phototaxis b) phototropism c) vernalisation d) photoperiodism

123. An ecosystem contains

- a) Green plants and animals only b) Green plants and decomposers only
c) Green plants, animals, decomposers and abiotic environment
d) Producers and consumers only

124. Arrange the following ecosystems in increasing order of their mean NPP (tons/ha/year).

- A. Tropical deciduous forest
B. Temperate coniferous forest
C. Tropical rainforest
D. Temperate deciduous forest

- a) $B < A < D < C$ b) $D < B < A < C$ c) $A < C < D < B$ d) $B < D < A < C$

125. Which of the following is edaphic factor of an ecosystem?

- a) Mountains b) Water c) Soil d) Slopes

126. Edaphic factor refers to

- a) water b) soil c) relative humidity d) altitude

127. Primary productivity depends upon

- a) light and temperature b) water and nutrients
c) photosynthetic capacity of producers d) all of these

128. The respiratory loss of producers, herbivores and carnivores are respectively

- a) 10%, 20%, 30% b) 20%, 30%, 60% c) 20%, 40%, 80% d) Always 10%

129. **Assertion:** Secondary succession always involves a predictable sequence of species and ends up with the same climax community as existed prior to the disturbance.

Reason: A pond cannot be considered as a self-sustained ecosystem as it does not possess all the structural and functional components which work as a unit in an ecosystem.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

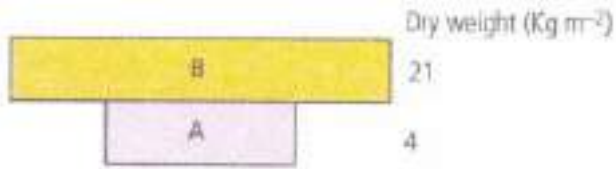
130. Natural reservoir of phosphorus is : _____.
a) Animal bones b) Rock c) Fossils d) Seawater
131. The biomass available for consumption by herbivores and decomposers is called :
a) Secondary productivity b) Standing crop c) Gross primary productivity
d) Net primary productivity
132. Biogeochemical cycle having a small gaseous component is
a) Oxygen b) Nitrogen c) Carbon d) Sulphur
133. Most animals that live in deep oceanic water are _____.
a) secondary consumers b) tertiary consumers c) detritivores
d) primary consumers
134. Vertical distribution of different species occupying different levels in a biotic community is known as: _____.
a) Stratification b) Zonation c) Pyramid d) Divergence
135. In the given figure, A, B, C, D, E and F represent some stages of hydrosere. Select the correct statement regarding these.



- a)
Hydrilla and Potamogeton occur in stage A; Nymphaea and Nelumbo occur in stage B.
b) Phragmites and Typha occur in stage C; Carex and Cyperus occur in stage D.
c) Alnus and Populus occur in stage E; Acer and Quercus occur in stage F.
d) All of these
136. The rate of formation of new organic matter by rabbit in a grassland, is called
a) net productivity b) secondary productivity c) net primary productivity
d) gross primary productivity.
137. Mass of living matter at a trophic level in an area at any time is called _____.
a) standing crop b) detritus c) humus d) standing state
138. The slow rate of decomposition of fallen logs in nature is due to the _____.
a) low moisture content b) poor nitrogen content
c) anaerobic environment around them d) low cellulose content
139. Which one of the following is not one of the three aspects studied in biogeochemical cycling?

- a) The nature and size of natural reservoir
 - b) The rate of movement between reservoirs
 - c) Interaction between different biogeochemical cycles
 - d) Creation of their own biogeochemical cycles by new species
140. **Assertion:** Phosphorus cycle is an imperfect cycle as a sufficient amount of phosphorus combines with Al^{3+} , Fe^{2+} and Ca^{2+} to form insoluble and unavailable salts.
Reason: Phosphate circulates in abiotic environment in lithosphere as well as in atmosphere.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
 - b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) If assertion is true but reason is false.
 - d) If both assertion and reason are false
141. Warm ocean surge of the peru current recurring every 5 to 8 year or so in the East pacific of South America is widely known as _____.
a) Magnox b) Gull srream c) El Nino d) Aye Aye
142. In which of the following biogeochemical cycles, atmospheric phase is absent/negligible?
a) Nitrogen b) Oxygen c) Phosphorus d) Water
143. Which one of the following is not used for construction of ecological pyramids?
a) Number of individuals b) Rate of energy flow c) Fresh weight d) Dry weight
144. All type of successions leads to
a) xeric climax community b) hydric climax community c) mesic climax community
d) any climax community depending on nature of habitat.
145. The energy and biomass relationship between the organisms at different trophic levels can better expressed by
a) food chain b) food web c) ecological pyramids d) energy cycle.
146. The transfer of energy from one trophic level to another is governed by the 2nd, law of thermodynamics. The average efficiency of energy transfer from herbivores to carnivores is _____.
a) 5% b) 10% c) 25% d) 50%
147. In an aquatic ecosystem, the organism present at the trophic level equivalent to cows in grasslands is
a) phytoplanktons b) large fishes c) sea gulls d) zooplanktons

148. Given figure represents a pyramid of biomass in an aquatic ecosystem.



Identify A and B and select the correct answer.

- (i) A is the crop which supports and B is the crop which is supported.
 - (ii) A is the crop which is supported and B is the crop which supports.
 - (iii) A is phytoplanktons and B is zooplanktons.
 - (iv) A is zooplanktons and B is phytoplanktons.
- a) (i) and (iv) b) (ii) and (iii) c) (i) and (iii) d) (ii) and (iv)
149. Which of the following ecological pyramids is generally inverted?
- a) pyramid of energy b) Pyramid of biomass in a forest
c) Pyramid of biomass in a sea d) Pyramid of numbers in grassland
150. Which is not true regarding ecosystem?
- a) Self sufficient unit
b) Cyclic exchange of materials between living beings and environment
c) Only requirement is input of energy d) Characterized by a major vegetation type
151. In the given food web, an increase in the population of hawks will not result in



- a) decrease in the population of rabbits and snakes
b) decrease in the population of mouse c) decrease in the population of lizards
d) decrease in the population of grasshoppers.
152. Read the given statements and select the correct option.
- Statement 1: Global water cycle does not involve the living organisms.
- Statement 2: In global water cycle, water circulates between hydrosphere and atmosphere.
- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

153. Read the following statements and select the correct ones

- (i) A given species may occupy more than one trophic level in the same ecosystem at the same time.
 - (ii) Productivity of an aquatic ecosystem is less than that of a terrestrial ecosystem.
 - (iii) Producers constitute the first trophic level of a detritus food chain
- a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

154. Fragmentation, leaching and catabolism are some of the important steps of decomposition. Study the following statements [(i), (ii) and (iii)] regarding these and select the correct option.

- (i) Detritivores (e.g., earthworm) break down detritus into smaller particles.
- (ii) Water soluble inorganic nutrients go down into soil horizon and get precipitated as unavailable salts.
- (iii) Decomposers (e.g., bacteria and fungi) secrete digestive enzymes and degrade detritus into simpler inorganic substances.

a)

Leaching	Fragmentation	Catabolism
(i)	(ii)	(iii)

b)

Leaching	Fragmentation	Catabolism
(iii)	(ii)	(i)

c)

Leaching	Fragmentation	Catabolism
(ii)	(i)	(iii)

d)

Leaching	Fragmentation	Catabolism
(ii)	(iii)	(i)

155. The slow rate of decomposition fallen logs is due to :

- a) Poor nitrogen content b) Anaerobic environment c) Low cellulose content
- d) Low moisture content

156. Annually one hectare of a healthy forest will

- a) Produce 10 tonnes of O_2 and absorb 10 tonnes of CO_2
- b) Produce 20 tonnes of O_2 and absorb 20 tonnes of CO_2
- c) Produce 10 tonnes of O_2 and absorb 30 tonnes of CO_2
- d) Produce 30 tonnes of O_2 and absorb 30 tonnes of CO_2

157. Gross primary productivity is

- a) Rate at which organic molecules are formed in an autotroph
- b) Rate at which organic molecules are used up by autotroph
- c) Storage of organic molecules in the body of an autotroph
- d) Rate at which organic molecules are transferred to next higher trophic level

158. Which of the following ecosystems is most productive in terms of net primary production?

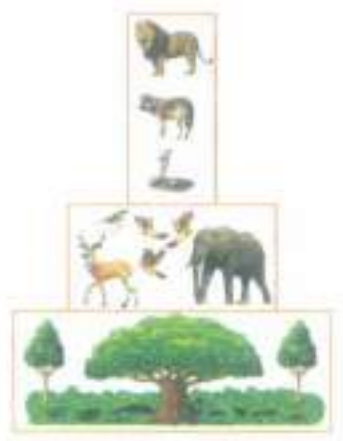
- a) Deserts b) Tropical rainforests c) Oceans d) Estuaries

159. If producer is a large tree that supports a number of herbivorous animals which are further attacked by ectoparasites, the pyramid of number shall be

- a) Inverted b) Upright c) Irregular d) Spindle shaped

160. Which of the statements given below is not true about formation of Annual Rings in trees?

- a)
Differential activity of cambium causes light and dark bands of tissue early and late wood respectively.
- b) Activity of cambium depends upon variation in climate.
- c) Annual rings are not prominent in trees of temperate region.
- d) Annual ring is a combination of spring wood and autumn wood produced in a year.
161. Which of the following pairs is not correct?
a) E. Haeckel - coined the term 'Ecology' b) Tansley - Coined the term 'Ecosystem'
c) R. Mishra - Father of Indian Ecology d) None of these
162. The plant which bears clinging roots is _____.
a) podostemon b) orchid c) Trapa d) Screwpine
163. The mass of living matter at a trophic level in an area at any time is called :
a) Humus b) Standing state c) Standing crop d) Detritus
164. The reservoir for the gaseous type of biogeochemical cycle exists in
a) stratosphere b) atmosphere c) ionosphere d) lithosphere
165. **Assertion:** During an ecological succession, the number of species increases, the community biomass increases and the community's ratio of respiration to photosynthesis also increases.
Reason: At climax community of an ecological succession, the rate of photosynthesis of a community is almost equal to the rate of respiration.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false
166. What kind of pyramid is represented by the given figure ?



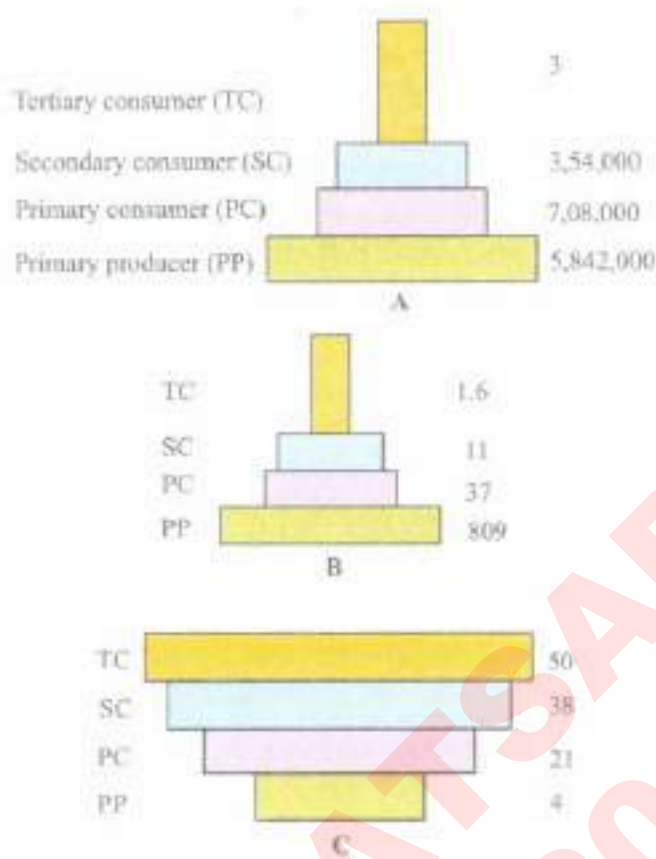
- a) Pyramid of numbers in a forest ecosystem.
b) Pyramid of numbers in a parasitic food chain.
c) Pyramid of biomass in a forest ecosystem. d) It is a wrong pyramid.

167. An association of individuals of different species living in the same habitat and having functional interactions is: _____.
 a) Biotic community b) Ecosystem c) Population d) Ecological niche
168. Action of detritivores in decomposition process is concerned with
 a) Humification b) Mineralisation c) Leaching d) Fragmentation
169. Given below is a table of factors affecting microbial decomposition. ('+' means 'favouring' and '-' means inhibiting or lowering). Select the correct option.
- a)
- | | | | |
|------------------|----------------|-------------------|-------------------------------|
| High-temperature | Lack of oxygen | Moist environment | Lignin and chitin in detritus |
| + | + | + | - |
- b)
- | | | | |
|------------------|----------------|-------------------|-------------------------------|
| High-temperature | Lack of oxygen | Moist environment | Lignin and chitin in detritus |
| + | - | + | - |
- c)
- | | | | |
|------------------|----------------|-------------------|-------------------------------|
| High-temperature | Lack of oxygen | Moist environment | Lignin and chitin in detritus |
| - | - | + | - |
- d)
- | | | | |
|------------------|----------------|-------------------|-------------------------------|
| High-temperature | Lack of oxygen | Moist environment | Lignin and chitin in detritus |
| - | + | + | - |
170. During the process of decomposition:
 a) CO_2 is consumed and O_2 is released b) O_2 is consumed and CO_2 is released
 c) CO_2 is consumed and H_2O is released d) none of these
171. Choose odd one out w.r.t. structure of ecosystem
 a) species diversity b) Productivity c) Species d) Stratification
172. The term ecosystem was coined by _____.
 a) E.P. Odum b) A.G Tansley c) E.Haeckel d) E. Wanning
173. What percentage of total global carbon is atmospheric carbon?
 a) 0.03% b) 1% c) 10% d) 30%
174. Which of the following types of ecosystem is expected in an area where evaporation exceeds precipitation, and mean annual rainfall is below 100mm?
 a) Grassland b) Shrubby forest c) Desert d) Mangrove
175. How much of the net primary productivity of a terrestrial ecosystem is eaten and digested by herbivores?
 a) 1% b) 10% c) 40% d) 90%
176. Select the incorrect food chain
 a) Grass → Grasshopper → Frog → Snake → Eagle
 b) Phytoplanktons → Zooplanktons → Small fish → Large fish
 c) Diatoms → Zooplanktons → Small fish d) Grass → Frog → Vulture
177. Which one of the following is not a correct match of the term and its description?

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- a) Ecosystem - Functional unit of nature b) Global ecosystem - Entire biosphere
c) Aquatic ecosystem- Wetland d) Natural ecosystem - Crop field

178. Study the following ecological pyramids carefully.



Match the following statements (i), (ii) and (iii) with given pyramids A, B and C and select the correct answer.

- (i) Inverted pyramid of biomass depicting small standing crop of phytoplanktons supporting a large standing crop of zooplanktons
(ii) Pyramid of numbers in a grassland ecosystem showing about 6 million producers
(iii) Upright pyramid of biomass
a) A - (ii), B - (iii), C - (i) b) A - (ii), B - (i), C - (iii) c) A - (i), B - (iii), C - (ii)
d) A - (i), B - (ii), C - (iii)

179. The zone at the edge of a lake or ocean which is alternatively exposed to air and immersed in water is called

- a) pelagic zone b) benthic zone c) lentic zone d) littoral zone

180. Plants such as Prosopis, Acacia and Capparis represent examples of tropic _____.

- a) grasslands b) thorn forests c) deciduous forests d) evergreen forests

181. In an ecosystem, the rate of production of organic matter during photosynthesis is termed as _____.

- a) Gross primary productivity b) Secondary productivity c) Net productivity
d) Net primary productivity

182. Identify the possible link "A" in the following food chain: Plant → insect → frog → "A" → Eagle

- a) Rabbit b) wolf c) Cobra d) Parrot

183. The ecosystem services include
 a) spiritual, cultural and aesthetic values b) all of these
 c) maintenance of biodiversity d) pollination of crop
184. The movement of energy from lower to higher trophic level is
 a) always unidirectional b) sometimes unidirectional c) always bidirectional
 d) undeterminable
185. Which of the following ecological pyramid is most representative of functional characteristics of an ecosystem?
 a) Pyramid of number b) Pyramid of biomass c) Pyramid of energy
 d) All are equally representative
186. **Assertion:** The process of nitrification involves the decomposition of proteins of dead plants and animals, and nitrogenous wastes like urea, uric acid, etc. of animals to ammonia.
Reason: Nitrogen cycle is a sedimentary cycle.
- a)
 If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
 If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
187. Net Primary Productivity (NPP) is given by the formula
 a) $NPP = GPP \times 100$ b) $NPP = GDP - \text{secondary productivity}$
 c) $NPP = GPP - \text{respiration rate}$ d) $NPP = \frac{GPP}{100}$
188. Which of the following ecosystem has the highest gross primary productivity?
 a) Grasslands b) Coral reefs c) Mangroves d) Equatorial rain forest
189. The second stage of hydro sere is occupied by plants like:
 a) Azolla b) Salix c) Typha d) Vallisneria
190. Match column I with column II and select the correct option from the given codes
- | Column I | Column II |
|---------------------------------|--|
| A. Artemisia tridentata | (i) Grows better in overgrazed area |
| B. Capparis spinosa | (ii) Dominate in areas destructed by fires |
| C. Pteris aquilina and Pyronema | (iii) Indicates intense soil erosion |
| D. Amaranthus and Chenopodium | (iv) Saline soils |
- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(ii), B-(iii), C-(iv), D-(i) c) A-(iii), B-(i), C-(ii), D-(iv)
 d) A-(iv), B-(iii), C-(ii), D-(i)
191. Study the following statements and select the incorrect one.

a) Shorter food chains provide more energy as compared to longer food chains.

b)

Ecological factors connected with physical geography of earth are called topographic factors.

c)

The pyramid of biomass is upright in a grassland ecosystem and the pyramid of numbers is upright in a parasitic food chain.

d) None of these

192. If 20 J of energy is trapped at producer level, then how much energy will be available to peacock as food in the following chain: Plant ~ Mice ~ Snake ~ Peacock

a) 0.02J b) 0.002J c) 0.2J d) 0.0002J

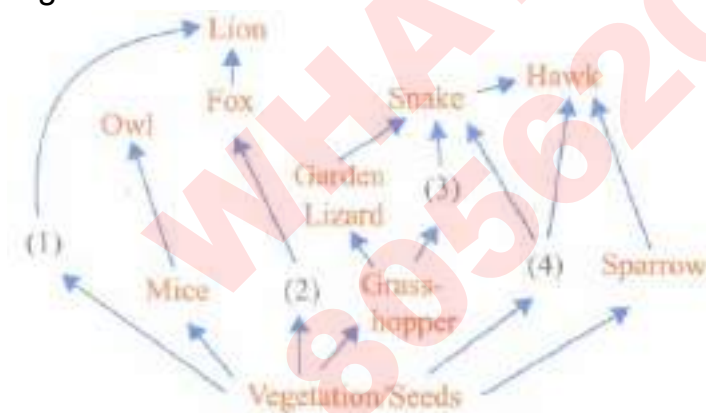
193. Percentage of photosynthetically active radiation (PAR) that is captured by plants in synthesis of organic matter is:

a) 50-70% b) 30-40% c) 80-100% d) 2-10%.

194. Out of the total proposed cost of various ecosystem services, cost of climate regulations and habitat for wildlife are

a) 50% b) 10% c) 6% d) 25%.

195. Given food web contains some missing organisms, (1), (2), (3) and (4). Identify these organisms and select the correct answer.



a)

(1)	(2)	(3)	(4)
Deer	Rabbit	Frog	Rat

b)

(1)	(2)	(3)	(4)
Dog	Squirrel	Bat	Frog

c)

(1)	(2)	(3)	(4)
Rat	Eagle	Tortoise	Crow

d)

(1)	(2)	(3)	(4)
Squirrel	Cat	Peacock	Pigeon

196. Pyramid of biomass for a grazing food chain represents

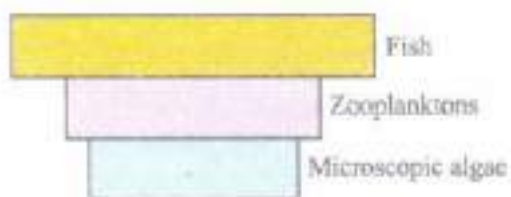
a) gradual decrease in biomass from apex to base

b) gradual decrease in biomass from producers to the tertiary consumers

c) gradual increase of the biomass from producers to the tertiary consumers

d) no change in biomass.

197. The rate at which light energy is converted into chemical energy of organic molecules is the ecosystem's
- net primary productivity
 - gross secondary productivity
 - net secondary productivity
 - gross primary productivity
198. Study the following statements regarding food chains and select the correct ones.
- Removal of 80% tigers from an area resulted in greatly increased growth of vegetation.
 - Removal of most of the carnivores resulted in an increased population of deers.
 - The length of food chains is generally limited to 3-4 trophic levels due to energy loss.
 - The length of food chains may vary from 2 to 8 trophic levels.
- (i) and (ii)
 - (ii) and (iii)
 - (i) and (iii)
 - (iii) and (iv)
199. Amount of biogenetic nutrients present in the abiotic environment per unit area at any time is called
- Standing quality
 - Standing crop
 - NPP
 - Nutrients immobilization
200. Ecological pyramids are also called
- pyramids of number
 - Eltonian pyramids
 - Pyramids of energy
 - Pyramids of biomass
201. The pyramid which cannot be inverted in a stable ecosystem is that of ____.
- biomass
 - number
 - energy
 - All of the above
202. Which is not true for humus?
- Dark coloured amorphous substance
 - Highly resistant to microbial action
 - Act as reservoir of nutrients and increases water holding capacity of soil
 -
- They are degradation product of protein and fats and are produced by the process of mineralisation
203. The natural reservoir of phosphorus is.
- Fossils
 - Sea water
 - Animal bones
 - Rocks
204. Upper part of sea/aquatic ecosystem contains ____.
- plankton
 - nekton
 - Both (a) and (b)
 - benthos
205. In an open ocean, the biomass of primary producers (microscopic algae) is often lower than the biomass of higher trophic levels (zooplanktons and fish), as illustrated below by an inverted pyramid of biomass. How can there be enough food in an open ocean to support the higher trophic levels?



- The microscopic primary producers are a source of food of high quality.
- The microscopic primary producers have high rates of growth and reproduction.

- c) The microscopic primary producers are less abundant.
 d) The higher trophic levels are cold-blooded animals which do not require much food.

206. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Standing state	(i) Fast and nearly perfect
B. Gaseous cycles	(ii) Amount of nutrients present in soil at given time
C. Standing crop	(iii) Slow and less perfect
D. Sedimentary cycles	(iv) Mass of living matter in a unit area

- a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(iii), B-(i), C-(iv), D-(ii) c) A-(i), B-(iii), C-(ii), D-(iv)
 d) A-(ii), B-(iii), C-(iv), D-(i)
207. Which ecosystem has the maximum biomass?
 a) Forest ecosystem b) Grassland ecosystem c) Pond ecosystem
 d) Lake ecosystem
208. Which one of the following statements for pyramid of energy is incorrect, whereas the remaining three are correct?
 a) Its base is broad. b) It shows energy content of different trophic level organisms.
 c) It is inverted in shape. d) It is upright in shape
209. Productivity at the second trophic level is always
 a) greater than the productivity at the first trophic level
 b) less than the productivity at the first trophic level
 c) equal to the productivity at the first trophic level
 d) extremely variable compared to the productivity at the first trophic level
210. Increase in concentration of the toxicant at successive trophic levels is known as :
 _____.
 a) Biodeterioration b) Biotransformation c) Biogeochemical d) Biomagnification
211. Productivity is the rate of production of biomass expressed in terms of
 (i) $(\text{kcal m}^{-3})\text{yr}^{-1}$
 (ii) $\text{g}^{-2}\text{yr}^{-1}$
 (iii) $\text{g}^{-1}\text{yr}^{-1}$
 (iv) $(\text{kcal m}^{-2})\text{yr}^{-1}$
 a) (ii) b) (iii) c) (ii) and (iv) d) (i) and (iii)
212. An ecosystem which can be easily damaged but can recover after some time if damaging effect stops, will be having
 a) low stability and high resilience b) high stability and low resilience
 c) low stability and low resilience d) high stability and high resilience.
213. In an ecosystem, which one shows one-way passage
 a) free energy b) carbon c) nitrogen d) potassium
214. Bulk CO_2 - fixation occurs in _____.
 a) crop plants b) oceans c) tropical rain forests d) temperate forests

215. The stable community during an ecological succession that would be near equilibrium with the environment is called
a) climax community b) pioneer community c) sere d) carnivores
216. Which is a functional aspect of ecosystem?
a) Productivity b) Species composition c) Diversity d) Life cycle
217. In a comparative study of grassland ecosystem and pond ecosystem, it may be observed that
a) the abiotic components are almost similar
b) the biotic components are almost similar
c) both biotic and abiotic components are different
d) primary and secondary consumers are similar.
218. The process of mineralisation by microorganisms helps in the release of
a) inorganic nutrients from humus b) both organic and inorganic nutrients from detritus
c) organic nutrients from humus
d) inorganic nutrients from detritus and formation of humus.
219. Which of the following are artificial aquatic ecosystems?
a) Large dams and reservoirs b) Lakes and canals c) Fishery tanks and Aquaria
d) All of these
220. Drawback of DDT as pesticide is _____.
a) it becomes ineffective after some time b) it is less effective than others
c) it is not easily/rapidly degraded in nature d) its high cost
221. Succession in a forest ecosystem is characterised by changes in species diversity, biomass and net primary productivity as shown in the graph below. Identify curves A, B and C



- a) A: biomass B: net primary productivity C: species diversity
b) A: species diversity B: net primary productivity C: biomass
c) A: net primary productivity B: biomass C: species diversity
d) A: net primary productivity B: species diversity C: biomass
222. Global ecosystem is
a) Biosphere b) Noosphere c) Socio-cultural environment d) None of these
223. Which one of the following is not a gaseous biogeochemical cycle in ecosystem?
a) Nitrogen cycle b) Carbon cycle c) Sulphur cycle d) Phosphorus cycle

224. Read the given statements and select the correct option.

Statement 1: Herbivores are also called as first-order consumers.

Statement 2: Herbivores obtain their food directly from plants.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

225. The correct sequence of plants in a hydrosere is

- a) Volvox → Hydrilla → Pistia → Scirpus → Carex → Quercus
- b) Pistia → Volvox → Scirpus → Hydrilla → Quercus → Carex
- c) Quercus → Carex → Volvox → Hydrilla → Pistia → Scirpus
- d) Quercus → Carex → Scirpus → Pistia → Hydrilla → Volvox

226. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Pioneers	(i) Vegetation which modifies its own environment and thus causing its own replacement
B. Autogenic succession	(ii) Replacement of existing community by external conditions
C. Allogenic succession	(iii) Establishment of organisms in an area into which they have come by dispersal or migration
D. Ecesis	(iv) Primary colonisers

- a) A-(iv), B-(i), C-(ii), D-(iii)
- b) A-(i), B-(ii), C-(iii), D-(iv)
- c) A-(ii), B-(i), C-(iv), D-(iii)
- d) A-(i), B-(iv), C-(iii), D-(ii)

227. Primary succession occurs on

- a) area destroyed due to forest fire
- b) newly formed river delta
- c) harvested crop field
- d) all of these

228. Study the four statements (i-v) given below and select the two correct ones out of them

- (i) A lion eating a deer and a sparrow feeding on grain are ecologically similar in being consumers.
- (ii) Predator star fish Pisaster helps in maintaining species diversity of some invertebrates.
- (iii) Predators ultimately lead to the extinction of prey species.
- (iv) Production of chemicals such as nicotine, strychnine by the plants are metabolic disorders.

The two correct statements are _____.

- a) (ii) and (iii)
- b) (iii) and (iv)
- c) (i) and (iv)
- d) (i) and (ii)

229. The annual net primary productivity of the whole biosphere is approximately

- a) 150 billion tons
- b) 160 billion tons
- c) 170 billion tons
- d) 180 billion tons

230. What is the amount of average price tag on nature's life support services determined by Robert Constanza and his colleagues?
a) US \$ 3 trillion a year b) US \$ 13 trillion a year c) US \$ 23 trillion a year
d) US \$ 33 trillion a year
231. In a food chain, the largest population is that of _____.
a) decomposers b) producers c) primary consumers d) tertiary consumers
232. About 71 % of total global carbon is found in
a) oceans b) forests c) grasslands d) agroecosystems.
233. Correct sequence of stages of succession of a lithosere is:
a)
Foliose lichens → Crustose lichens → Mosses → Annual grasses → Perennial grasses → Shrubs → Trees
b)
Crustose lichens → Foliose lichens → Mosses → Perennial grasses → Annual grasses → Shrubs → Trees
c)
Crustose lichens → Foliose lichens → Mosses → Annual grasses → Perennial grasses → Shrubs → Trees
d)
Crustose lichens → Foliose lichens → Mosses → Annual grasses → Shrubs → Perennial grasses → Trees
234. If the carbon atoms fixed by producers already have passed through three species, the trophic level of the last species would be:
a) scavenger b) tertiary producer c) tertiary consumer d) secondary consumer
235. Successions that occur on soils or areas which have recently lost their community are referred to as
a) primary successions b) secondary successions c) lithoseres d) priseres
236. The ultimate energy source of all ecosystems is
a) producers b) organic molecules c) carbohydrate d) solar radiation.
237. Which kind of pyramid is represented by the given figure?



- a) Inverted pyramid of numbers b) Inverted pyramid of biomass
c) Inverted pyramid of energy d) Both (a) and (b)

238. In a grassland ecosystem, if the number of primary producers (plants) is approximately 6 million, the number of top carnivores, which may be supported by them will be
a) 3 million b) 30 million c) 6 million d) 60 million

239. Read the given statements and select the correct option.

Statement 1: Decomposition is the physical and chemical breakdown of complex organic matter into simple inorganic substances.

Statement 2: Humification is the process of formation of humus from detritus or organic remains.

- a) Both statements 1 and 2 are correct.
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

240. Pyramid of number in a pond ecosystem is _____.

- a) irregular b) inverted c) upright d) spindle-shaped

241. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Presence of 3-4 storeyed plant crowns in a forest	(i) Blue-green algae
B. A biome having grasses with scattered trees	(ii) Stratification
C. Man made ecosystem	(iii) Savannah
D. Pioneer in hydrosere	(iv) Dam

- a) A-(ii), B-(iii), C-(iv), D-(i) b) A-(ii), B-(iii), C-(i), D-(iv) c) A-(i), B-(iii), C-(iv), D-(ii)
- d) A-(iii), B-(iv), C-(ii), D-(i)

242. Pyramid of numbers is

- a) always upright b) always inverted c) either upright or inverted
- d) neither upright nor inverted

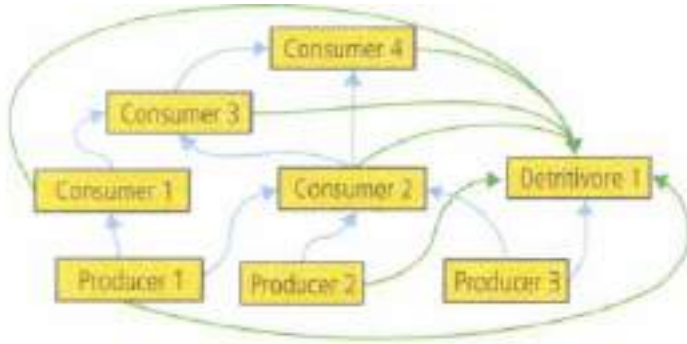
243. Decomposers like fungi and bacteria are

- (i) autotrophs
- (ii) heterotrophs
- (iii) saprotrophs
- (iv) chemo-autotrophs

Choose the correct answer

- a) (i) and (iii) b) (i) and (iv) c) (ii) and (iii) d) (i) and (ii)

244. The given diagram represents the relationships between organisms in a remote pond ecosystem. From this information, which of the following is the most likely to be correct?



- a)
DDT present in the ecosystem would accumulate to the highest concentrations in the tissues of detritivore 1.
- b)
The introduction of consumer 4 individuals from an external population would lead to a temporary increase in numbers of producer 2.
- c)
Disease in the producer 1 population would lead to an increase in the producer 3 population.
- d)
Extermination of consumer 3 would cause a sustained increase in the population of consumer 2.
245. Read the given statements and select the correct option.
Statement 1: Pioneer community is the stable and final biotic community of an ecological succession.
Statement 2: Pioneer community has maximum diversity and niche specialisation.
- a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect
246. If we completely remove the decomposers from an ecosystem, its functioning will be adversely affected, because _____.
a) energy flow will be blocked b) herbivores will not receive solar energy
c) mineral movement will be blocked d) rate of decomposition will be very high
247. The maximum biomagnification would be in which of the following in case of aquatic ecosystem?
a) Fishes b) phytoplanktons c) Birds d) Zooplanktons
248. Which one occupies more than one trophic level in a pond ecosystem?
a) Zooplankton b) Phytoplankton c) Fish d) Frog
249. Nutrient immobilisation

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- a) Prevents leaching of nutrients b) Is incorporation of nutrients in microbes
- c) Is covalent linking of nutrients with one another d) More than one is correct

250. Vertical distribution of different species occupying different levels in dense vegetation is called

- a) standing crop b) trophic structure c) stratification d) species composition

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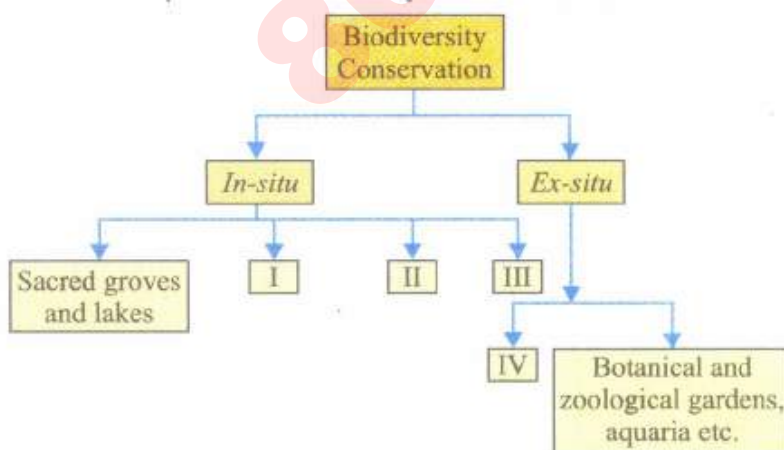
**RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308****Time : 1 Mins****BIODIVERSITY AND CONVERSATION 1****Marks : 880**

- Which one of the following areas in India, is a hotspot of biodiversity?
a) Eastern Ghats b) Gangetic plain c) Sunderbans d) Western Ghats
- Ex situ conservation is used for the conservation of
a) all plants b) all animals c) threatened animals and plants d) both (a) and (b)
- The organization which publishes the Red List of species is _____.
a) ICFRE b) IUCN c) UNEP d) WWF
- First 'Earth Summit' for 'Convention on Biological Diversity' (CBD) was held at
a) Johannesburg (2002), South Africa b) Rio de Janeiro (1992), Brazil
c) Dehradun (1992), India d) New York (2000), U.S.A
- National Park associated with rhinoceros is _____.
a) Kaziranga b) Ranthambore c) Corbett d) Valley of flowers
- Overexploitation has resulted in the extinction of
a) Steller's cow b) Lantana c) Passenger pigeon d) Both (1) & (3)
- Which of the following is the correct matching pair of a sanctuary and its main protected wild animal?
a) Gir - Lion b) Sariska - Tiger c) Sunderban - Rhino d) Kaziranga - Musk deer
- Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Rivet Popper hypothesis	(i) Paul Ehrlich
B. Long-term ecosystem experiments using outdoor plots	(ii) David Tilman
C. Species-area relationships	(iii) Alexander von Humboldt

- a) A-(iii), B-(i), C-(ii) b) A-(i), B-(ii), C-(iii) c) A-(i), B-(iii), C-(ii) d) A-(ii), B-(iii), C-(i)
- Floods can be prevented by
a) Making the soil less slopy b) Removing forests c) Removing soil cover
d) Planting trees on slopes and building dams
 - Which of the following is the most important cause of animals and plants being driven to extinction?
a) Overexploitation b) Alien species invasion c) Habitat loss and fragmentation
d) Co-extinctions
 - The zone of atmosphere in which the ozone layer is present is called

- a) Ionosphere b) Mesosphere c) Stratosphere d) Troposphere
12. Protected areas are example of
a) In-situ conservation b) Ex-situ conservation c) Cryopreservation
d) Green Houses
13. How many species are documented to be extinct in last 500 years by IUCN Red List, 2004?
a) 567 b) 784 c) 2,000 d) 87
14. Out of more than 1.5 million known species, insects constitute _____ of the total animals
a) 70% b) 25% c) 50% d) 75%
15. One of the endangered species of Indian medicinal plants is that of _____.
a) Ocimum b) Garlic c) Nepenthes d) porlophylluur
16. Which of the following statements regarding the ethical argument for conserving biodiversity is incorrect?
a)
We owe to millions of plant, animal and microbe species with whom we share this planet.
b) Every species has an intrinsic value only when it is of an economic value to us.
c) It is our moral duty to care for the well-being of all species i.e., our biological legacy
d) All of these
17. Regional diversity is also called
a) Alpha diversity b) Beta diversity c) Gamma diversity
d) Within community diversity
18. Select the option that correctly identifies I, II, III and IV.



- a)
I - Biosphere reserves; II - National parks, wildlife sanctuaries, III - Sacred groves; IV - Gene banks, cryopreservation
- b)
I - Sacred plants, home gardens; II - National parks, wildlife sanctuaries; III - Arboreta; IV - Gene banks, cryopreservation

c)

I - Biosphere reserves; II - Gene banks, cryopreservation; III - Sacred plants, home gardens; IV - National parks, wildlife sanctuaries

d)

I - Biosphere reserves; II - Aroboreta; III - Gene banks, cryopreservation; IV - National parks, wildlife sanctuaries

19. Which of the following statements is incorrect regarding biodiversity?

a)

Biodiversity deals with biological and geographical units such as genes, chromosomes, species, families and biogeographic regions.

b) Biodiversity is an addition sum of genetic, taxonomic and ecosystem diversity.

c) It is a measure of the amount of resources shared by the human population.

d) None of these

20. A hotspot of biodiversity in India is :

a) Eastern Ghats b) Western Ghats c) Gangetic plain d) Sunderbans

21. Which is the national aquatic animal of India?

a) Sea horse b) Gangetic shark c) River dolphin d) Blue whale

22. Alexander Von Humbolt described for the first time: _____.

a) Laws of limiting factor b) Species area relationships

c) Population Growth equation d) Ecological biodiversity

23. Sacred groves are specially useful in

a) Generating environmental awarness b) Preventing soil erosion

c) Year-round flow of water in rivers d) Conserving rare and threatened species

24. Read the given statements and select the correct option regarding this.

(i) Ecosystem services provided by nature to human beings such as oxygen for respiration, aesthetic value, etc.

(ii) Direct economic benefits derived from nature by human beings such as food, medicines, etc.

(iii) Every species has an intrinsic value, even if it is not of any economic use to us.

With respect to above given codes (i), (ii) and (iii) choose the correct option.

a)

Narrowly utilitarian	Broadly utilitarian	Ethical
(iii)	(ii)	(i)

b)

Narrowly utilitarian	Broadly utilitarian	Ethical
(ii)	(i)	(iii)

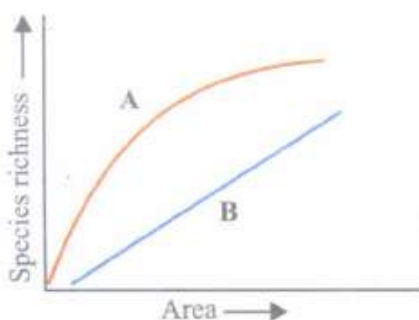
c)

Narrowly utilitarian	Broadly utilitarian	Ethical
(i)	(ii)	(iii)

d)

Narrowly utilitarian	Broadly utilitarian	Ethical
(ii)	(iii)	(i)

25. Wildlife is destroyed most when _____.
 a) there is lack of proper care b) mass scale hunting for foreign trade
 c) its natural habitat is destroyed d) natural calamity
26. Among the ecosystem mentioned below, where can one find maximum biodiversity?
 a) Mangroves b) Desert c) Coral reefs d) Alpine meadows
27. An example of ex situ conservation is _____.
 a) National park b) Seed Bank c) Wildlife Sanctuary d) Sacred Grove
28. Which of the following is not a cause for loss of biodiversity?
 a) Destruction of habitat b) Invasion by alien species
 c) Keeping animals in zoological parks d) Over-exploitation of natural resources
29. Man made mass extinction of species represent a very severe depletion of biodiversity called as
 a) Mass extinction b) Natural extinction c) Anthropogenic extinction
 d) Background extinction
30. Which one of the following shows maximum genetic diversity in India?
 a) Groundnut b) Rice c) Maize d) Mango
31. Which of these organisms are protected by people of 'Bishnoi' community of Rajasthan?
 a) Prosopis cineraria b) Black buck c) Bhojpatra d) Both (a) and (b)
32. The zone of biosphere reserve where no human activity is permitted is known as
 a) Buffer zone b) Core zone c) Manipulation zone d) Transition zone
33. Which anticancerous botanical-chemical is obtained from a Gymnosperm?
 a) Ephedrine b) Strychnine c) Taxol d) Reserpine
34. Which option correctly describes the equations for curves A and B, in the given graph of species - area relationship?



a)

A	B
$S = CA^Z$	$\log S = \log C + Z \log A$

b)

A	B
$\log S = \log C + Z \log A$	$S = CA^Z$

c)

A	B
$\log C = \log S + Z \log A$	$S = CA^Z$

d)

A	B
$S = CA^Z$	$\log C = \log S + Z \log A$

35. In the tropical rainforest, the majority of trees have showy animal-pollinated flowers. In temperate forests the majority of trees are wind pollinated. Which factors best explain these contrasting patterns?
- (i) Wind is rare in tropical forests.
 (ii) Because of high species diversity in the tropics, individuals of tree species are often widely separated making wind an inefficient means of pollen dispersal.
 (iii) More opportunities for coevolved mutualisms exist in tropical forests because of the high diversity of animal species.
 (iv) Trees in tropical forests are mostly evergreen and year-round leaf canopies impede pollen dispersal by wind.
 (v) Flowering in tropical forests occurs over a short period of time when wind is absent
- a) (i), (ii) and (v) b) (i), (iii) and (v) c) (ii), (iii) and (iv) d) (ii) and (iv)
36. In a national park, protection is provided to
- a) flora and fauna b) entire ecosystem c) fauna only d) flora only
37. Select the correct option regarding sacred forests or groves
- a) These are forest patches which are held in high esteem by tribal communities
 b) Rare endemic species can be found flourishing in these areas
 c) These are found in several parts of India. d) All of these
38. Tropics (23.5°N to 23.5°S) have _____ species as compared to temperate or polar regions.
- a) less b) equal c) more d) none of these
39. Antelope cervicapra (blackbuck) is
- a) of least concern b) endangered c) critically endangered d) extinct in the wild.
40. Which of the following is considered a hot-spot of biodiversity in India?
- a) Indo-Gangetic Plain b) Eastern Ghats c) Aravalli Hills d) Western Ghats
41. Which of the following is mainly responsible for extinction of wildlife?
- a) Destruction of habitats b) Pollution of air and water c) Hunting for flesh
 d) All of the above
42. Introduction of alien species into new area poses a threat to extinction of indigenous species due to
- a) their high nutrient requirement b) their symbiotic relationship
 c) absence of their natural predators d) more intraspecific competition.
43. In which of the following both pairs have correct combination _____ .

- a) In situ conservation: Cryopreservation Ex-situ conservation: Wildlife Sanctuary.
b) In situ conservation: Seed Bank Ex-situ conservation: National park.
c) In situ conservation: Tissue culture Ex-situ conservation: Sacred groves.
d) In situ conservation: National park Ex-situ conservation: Botanical Garden.
44. According to IUCN, some of the extinctions include
(i) Dodo
(ii) Indian gazelle
(iii) Thylacine
(iv) Steller's sea cow
a) (i), (ii), (iii) and (iv) b) (ii) and (iv) c) (i), (iii) and (iv) d) (iii) and (iv)
45. There are four major causes of accelerated rates of species extinction, which are collectively called as 'the evil quartet'. Which one of the following is not included in 'the evil quartet'?
a) Over exploitation b) Pollution c) Co-extinctions d) Alien species invasions
46. The term biodiversity is popularised by
a) Odum b) Paul Ehrlich c) Edward Wilson d) Tilman
47. Quercus species are the dominant component in _____.
a) Temperate deciduous forests b) Alpine forests c) Scrub forests
d) Tropical rain forests
48. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Over-exploitation of a species reduces the size of its population eventually leading to its extinction.
Reason: Steller's sea cow is a large, herbivorous terrestrial mammal which is on the verge of extinction due to over exploitation.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
49. What is common to the following plants: Nepenthes, Psilotum, Rauwolfia and Aconitum?
a) All are ornamental plants b) All are phylogenetic link species
c) All are prone to over exploitation.
d) All are exclusively present in the Eastern Himalayas
50. Which one of the following is not a feature of biodiversity hotspots?
a) Large number of species b) Abundance of endemic species
c) Mostly located in the polar regions d) Mostly located in the polar regions

51. Western ghats have a greater number of amphibian species than the Eastern ghats. What kind of diversity does it represent?
a) Species diversity b) Genetic diversity c) Ecological diversity d) None of these
52. Alpha diversity is biodiversity present
a) within community b) between communities c) ranges of communities
d) none of these
53. The region of biosphere Reserve which is legally protected and where no human activity is allowed, is known as _____.
a) Buffer zone b) Transition zone c) Restoration zone d) Core zone
54. Diversity of organisms living in the region:
a) Birds b) Angiosperms c) Fungi d) Insects
55. MAB stands for _____.
a) Man And Biology Programme b) Man And Biosphere Programme
c) Mammals And Biosphere d) Mammals And Biology Programme
56. The reasons behind conserving biodiversity have been grouped into which of the following categories?
a) Narrowly utilitarian b) Broadly utilitarian c) Ethical d) All of these
57. A more conservative and scientifically sound estimate about the total number of species present on earth, was made by
a) Robert May b) Paul Ehrlich c) David Tilman d) Both A and B
58. According to May's global estimates how many species of plants and animals, respectively, are yet to be discovered and described from India?
a) 50,000 and 90,000 b) 3,00,000 and 90,000 c) 3,00,000 and 1,00,000
d) 1,00,000 and 3,00,000
59. Which of the following represent maximum number of species among global biodiversity _____.
a) Lichens b) Fungi c) Mosses and Ferns d) Algae
60. A critically endangered animal is
a) passenger pigeon b) dodo c) great Indian bustard d) zebu
61. Which of the following National Parks is home to the famous deer Hangul?
a) Dachigam National Park, J and K b) Keibul Lamjao National Park, Manipur
c) Bandhavgarh National Park, Madhya Pradesh
d) Eaglenest Wildlife Sanctuary, Arunachal Pradesh
62. The highest number of species in the world is represented by _____.
a) Fungi b) Mosses c) Algae d) Lichens

63. Some animals are shown below. Identify the national park concerned chiefly with their preservation and select the correct option.



(1)



(2)



(3)



(4)

A. Velavadar National Park, Gujarat

B. Jim Corbett National Park, Uttarakhand

C. Gir Forest, Gujarat

D. Kaziranga National Park, Assam

a) A-(2), B-(3), C-(1), D-(4) b) A-(4), B-(3), C-(1), D-(2) c) A-(4), B-(2), C-(3), D-(1)

d) A-(3), B-(1), C-(2), D-(4)

64. A species facing an extremely high risk of extinction in the immediate future is called:

_____.

a) vulnerable b) Endemic c) Critically endangered d) Extinct

65. Sacred groves are found in Khasi and Jaintia hills of ____ (i) ____, Aravalli hills of ____ (ii) ____, Western Ghat regions of ____ (iii) ____.

a)

(i)	(ii)	(iii)
Meghalaya	Rajasthan	Karnataka and Maharashtra

b)

(i)	(ii)	(iii)
Meghalaya and Maharashtra	Rajasthan	Madhya Pradesh

c)

(i)	(ii)	(iii)
Madhya Pradesh and Maharashtra	Rajasthan	Meghalaya

d)

(i)	(ii)	(iii)
Rajasthan	Meghalaya	Karnataka and Maharashtra

66. Which one of these is not included in the biodiversity hotspots of India?

a) Western Ghats b) Himalayas c) Indo-Burma d) North Indian Plains

67. Which of the following groups does not include the countries which contribute to 12 megadiversity centres of the world?

(i) Mexico, Columbia, Brazil

- (ii) Peru, Ecuador, Venezuela
- (iii) Madagascar, Indonesia, Malaysia
- (iv) China, Germany, Japan
- (v) China, India, Australia
- a) (ii) b) (v) c) (iii) d) (iv)

68. India is one of the 17 megadiversity countries of the world and is being divided into _____ biogeographical regions.

- a) 8 b) 10 c) 16 d) 18

69. _____ National Park was the first national park of India.

- a) Jim Corbett b) Nanda Devi c) Kaziranga d) Jaldapara

70. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: Broadly utilitarian arguments say that we should conserve biodiversity because biodiversity plays a major role in many ecosystem services that nature provides.

Reason: Exploration of molecular, genetic and species level diversity to obtain the products of economic importance is included under broadly utilitarian category.

a)

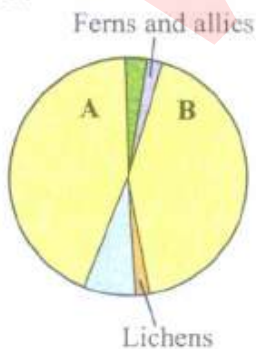
If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false

71. The given pie diagram represents the proportionate number of species of major taxa of plants. Select the incorrect statements regarding A and B.



(i) A represents the achloro-phyllous, heterotrophic, eukaryotic organisms with chitinous cell walls.

(ii) B represents the members of Kingdom Monera, e.g., bacteria and cyanobacteria.

(iii) B represents those seed plants in which seeds are enclosed inside fruits.

(iv) A and B represent gymnosperms and angiosperms respectively.

- a) (i) and (iv) b) (ii) and (iv) c) (i) and (iii) d) (ii), (iii) and (iv)

72. Select the correct statement about diversity :

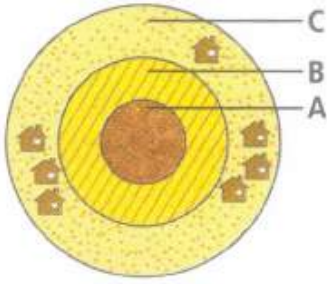
- a) Large scale planting of Bt cotton has no adverse effect on biodiversity
b) Conservation of biodiversity is a fad pursued by developed countries

- c)
Desert areas of Rajasthan and Gujarat have a very high level of desert animal species as well as numerous rare animals
d) Western Ghats have a very high degree of species richness and endemism
73. _____ is the exploration of molecular, genetic and species-level diversity for gaining the products of economic importance.
a) Exploitation b) Bioprospecting c) Co-extinction d) Patenting
74. Find the odd one (w.r.t. weed)
a) Lantana camara b) Eichhornia c) Helianthus d) Parthenium hysterophorus
75. More than 25% of drugs are derived from plants. What kind of benefit does this describe?
a) Ethical value b) Aesthetic value c) Direct economic value
d) Indirect economic value
76. Which pair of geographical area shows maximum diversity in our country?
a) Sunderbans and Rann of Kutch b) Eastern Ghats and Western Ghats
c) Eastern Himalayas and Western Ghats d) Kerala and Punjab
77. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: One of the most important traditional uses of sacred groves was that they acted as a repository for various ayurvedic medicines.
Reason: In modern times, sacred groves have become biodiversity rich areas, as they provide refuge to various plant and animal species of conservation significance
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
78. The species confined to a particular region and not found elsewhere is termed as _____.
a) Alien b) Endemic c) Rare d) Keystone
79. Which one of the following is the correct matched-pair of an endangered animal and National park?
a) Rhinoceros - Kaziranga National park b) Wild ass - Dudhwa National park
c) Great Indian - Keoladeo National park bustard d) Lion - Corbett National park
80. Presently, total number of biodiversity hotspots in the world is
a) 25 b) 34 c) 37 d) 40
81. Species diversity _____ as we move away from the _____ towards _____

- a) decreases, equator, poles b) increases, equator, poles
c) decreases, poles, equator d) none of these
82. The term "the evil quartet" is related with four major causes of
a) forest loss b) population explosion c) air pollution d) biodiversity losses
83. Which of the given statements is true?
a) National parks are meant for the protection of fauna only.
b) Wildlife sanctuaries are meant for the protection of both flora and fauna
c)
Activities like collection of forest products, harvesting of timber, private ownership of land, etc. are allowed in national parks.
d) None of these
84. 'Broadly utilitarian' argument for the conservation of biodiversity does not include
a) bioprospecting b) pollination c) aesthetic value d) climatic regulation
85. In which one of the following pairs is the specific characteristic of a soil not correctly matched?
a) Laterite - Contains aluminum compound b) Terra rossa - Most suitable for roses
c) Chemozems - Richest soil in the world d) Black soil - Rich in calcium carbonate
86. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: Biodiversity hotspots are the regions which possess high levels of species richness, high degree of endemism and no loss to habitats
Reason: Total number of biodiversity hotspots in the world is 32 with two of these hotspots found in India
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
87. According to Robert May, the global species diversity is about _____.
a) 50 million b) 7 million c) 1.5 million d) 20 million
88. Identify the odd combination of the habitat and the particular animal concerned _____.
a) Sunderbans - Bengal Tiger b) Periyar- Elephant c) Rann of Kutch - Wild Ass
d) Dachigam- Snowleopard, National park
89. Biodiversity loss occurs due to
(i) habitat loss and fragmentation
(ii) co-extinction
(iii) over-exploitation
(iv) alien species invasion

- a) (i) and (ii) b) (i), (ii) and (iii) c) (ii), (iii) and (iv) d) (i), (ii), (iii) and (iv)

90. Refer to the given figure representing different zones of a biosphere reserve.



Choose the correct answer as per the statements given below.

- (i) Limited human activity is allowed such as for research and education.
(ii) An active co-operation occurs between reserve management and local people for activities like cropping, settlements, etc.
(iii) No human activity is allowed.

a)	b)	c)	d)
(i)(ii)(iii)	(i)(ii)(iii)	(i)(ii)(iii)	(i)(ii)(iii)
A B C	B C A	C A B	C B A

91. An area is declared as 'hot spot' when:

- a) It has 1500 or more endemic species and 75% of its original habitat is lost
b) It has 1500 or more vertebral species and 75% of its original habitat is lost
c) It has more than 2000 species of plants
d) Most of the species inhabiting the area are facing

92. Which of the following regions of the globe exhibits highest species diversity?

- a) Himalayas b) Amazon forests c) Western Ghats of India d) Madagascar

93. Government of India has provided the private ownership rights for

- a) A national park b) A sanctuary c) A biosphere reserve d) Zoo

94. An exotic species that is introduced to a new area, spreads rapidly and eliminates native species is called

- a) immigrant species b) invasive species c) destructive species d) none of these

95. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: Critically endangered category includes the species which have sufficient population at present but is undergoing depletion due to some factors.

Reason: Vulnerable category includes the species which are facing very high risk of extinction in the wild and can become extinct any moment.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false d) If both assertion and reason are false.
96. Organisation responsible for maintaining Red Data Book is
a) IUCN b) WWF c) CITES d) IBWL
97. Wild populations of plants and animals and traditional life styles of tribals are protected in
a) Biosphere Reserve b) Sanctuary c) National Park d) Botanical Garden
98. Silent valley of Kerala is being preserved because it has
a) Rare plants and animals b) Only natural forest of India c) Costly timber plants
d) Recreational value
99. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: In a wildlife sanctuary, collection of timber, harvesting of minor forest products and private ownership rights are allowed.
Reason: A sanctuary is a protected area meant for the conservation of both flora and fauna where cultivation of land is permitted
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false
100. Who confirmed communities with more species tend to be more stable than those with less species?
a) Alexander von Humboldt b) David Tilman c) Paul Ehrlich d) Edward Wilson
101. Dodo, passenger pigeon and Steller's sea cow became extinct in the last 500 years due to:
a) habitat destruction b) over-exploitation c) bird-flu virus infection d) pollution
102. The biodiversity of a geographic region represents :
a) Genetic diversity present in the dominant species of the region
b) Species endemic to the region c) Endangered species found in the region
d) Diversity of organisms living in the region
103. The exotic species, which when introduced in India became notorious weed, is:
a) Lantana camara b) Eicchornia crassipes c) Parthenium hysterophorus
d) all of these
104. Which of the following group exhibit more species diversity?
a) Gymnosperms b) Algae c) Bryophytes d) Fungi
105. Amongst the animal groups given below, which one has the highest percentage of endangered species?
a) Insects b) Mammals c) Amphibians d) Reptiles

106. Which of the following statements regarding biodiversity hotspots are incorrect?
- (i) High endemism
 - (ii) High level of species richness
 - (iii) Total number is 34 in the world
 - (iv) Five of these occur in India
 - (v) High alien species invasion
 - (vi) Over less than 2% of the earth's land area; but if properly conserved, they can reduce extinctions by about 30%
- a) (i) and (ii) b) (iv) and (v) c) (iv), (v) and (vi) d) (iii), (iv), (v) and (vi)
107. Waking up to a bulbul's song in the morning is related to
- a) narrow utilitarian b) broadly utilitarian c) ethical d) both (b) and (c)
108. India constitutes _____ percent of the world's land area and contributes _____ percent of the global species diversity.
- a) 1.0, 5.5 b) 5.5, 1.0 c) 8.1, 2.4 d) 2.4, 8.1
109. All of the following are included in ex-situ conservation except:
- a) botanical gardens b) sacred groves c) wildlife safari parks d) seed banks
110. Ecological hotspots present in India are
- a) one b) two c) three d) five
111. Rivet popper hypothesis was given by
- a) Paul Ehrlich b) Alexander von Humboldt c) David Tilman d) Robert May
112. India has _____ biosphere reserves, _____ national parks and _____ wildlife sanctuaries till 2018.
- a) 20; 90; 500 b) 14; 85; 348 c) 18; 103; 544 d) 11; 91; 500
113. When a species becomes extinct, the plant and animal species associated with it in an obligatory way also become extinct. This phenomenon is referred to as
- a) fragmentation b) alien species invasion c) over-exploitation d) co-extinction.
114. The narrowly utilitarian arguments for biodiversity conservation include which of the following from the given list?
- (i) Industrial products like dyes, lubricants
 - (ii) Ecosystem services like photosynthesis
 - (iii) Pollinators layer of bees, birds and bats
 - (iv) Firewood, fibre and construction material
 - (v) The aesthetic pleasure of walking through thick woods
 - (vi) Products of medicinal importance
 - (vii) Watching spring flowers in full bloom
- a) (i), (ii), (v) and (vii) b) (ii), (iii), (v) and (vii) c) (i), (iv) and (vi) d) (iii), (v), (vi) and (vii)

115. Just as a person moving from Delhi to Shimla to escape the heat for the duration of hot summer, thousands of migratory birds from Siberia and other extremely cold northern regions move to: _____.

- a) western Ghat b) Meghalaya c) Corbett National park d) Keoladeo National park

116. Select the correct term for the following definitions (i, ii, iii, iv).

(i) The taxon is liable to become extinct if not allowed to realise its full biotic potential by providing protection from exotic species/human exploitation/ habitat deterioration/depletion of food.

(ii) The taxon has been completely eliminated or died out from earth, e.g., Dodo.

(iii) The taxon is facing a high risk of extinction in the wild in the near future due to decrease in its habitat, excessive predation or poaching.

(iv) They are species with naturally small populations, either localised or thinly scattered, which are always at risk from pests/pathogens/predators/ exotic species.

a)

(i)	(ii)	(iii)	(iv)
Threatened	Extinct	Endangered	Rare

b)

(i)	(ii)	(iii)	(iv)
Endangered	Extinct	Threatened	Rare

c)

(i)	(ii)	(iii)	(iv)
Extinct	Rare	Threatened	Endangered

d)

(i)	(ii)	(iii)	(iv)
Threatened	Extinct	Rare	Endangered

117. India has a greater ecosystem diversity than a Scandinavian country like Norway. What kind of diversity does it represent?

- a) Species diversity b) Ecological diversity c) Genetic diversity d) None of these

118. Biosphere reserves differ from national parks and wildlife sanctuaries because in the former

- a) human beings are not allowed to enter b) people are an integral part of the system
c) plants are paid greater attention than the animals
d) living organisms are brought from all over the world and preserved for posterity

119. Which one of the following is not a method of in situ conservation of biodiversity?

- a) Wildlife Sanctuary b) Botanical Garden c) Sacred Grove d) Biosphere Reserve

120. Study the given populations and choose the correct answer in relation to species diversity.

Population	Species	Group	Individuals
Population A	I	Mammals	3
	II	Birds	2
	III	Amphibians	2
Population B	I	Mammals	2
	II	Mammals	2
	III	Amphibians	1

Population	Species	Group	Individuals
Population C	I	Mammals	3
	II	Mammals	2
	III	Mammals	1

a)

Maximum diversity	Minimum diversity
Population B	Population C

b)

Maximum diversity	Minimum diversity
Population A	Population C

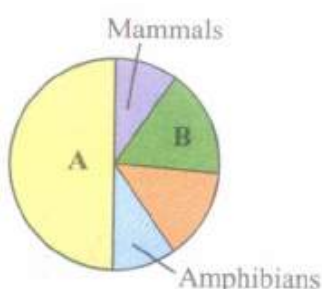
c)

Maximum diversity	Minimum diversity
Population A	Population B

d)

Maximum diversity	Minimum diversity
Population B	Population A

121. American water plant that has become a troublesome waterweed in India is _____.
 a) *Cyperus rotundus* b) *Eichhornia crassipes* c) *Trapa natifolia* d) *Trapa bispinosa*
122. The active chemical drug reserpine is obtained from
 a) *Datura* b) *Rauwolfia* c) *Atropa* d) *Papaver*
123. Where would the greatest number of endemic species occur and why?
 a)
 Small volcanic archipelagos, such as the Galapagos Islands, because the abundance of unoccupied habitats favours the adaptive divergence of colonists from nearby mainland populations.
 b)
 Large oceanic islands, such as Australia, because the inhabitants have been isolated from mainland populations for a very long time.
 c)
 On rugged landscapes, such as Patagonia, because of the high levels of natural disturbance by glaciers and earthquakes.
 d)
 Temperate woodlands, such as those in southern England, because of the high levels of disturbance by human activity and the long history of artificial selection.
124. The Indian rhinoceros is the most important protected species in
 a) Gir National Park b) Bandipur National Park c) Corbett National Park
 d) Kaziranga National Park
125. The given pie diagram Mammals represents the proportionate number of species of major taxa of vertebrates. Identify the groups A and B.



- a) A - Reptiles, B - Birds b) A - Fish, B - Birds c) A - Birds, B - Fish
d) A - Birds, B - Reptiles
126. Which of the following statements is correct?
a) Parthenium is an endemic species of our country.
b) African catfish is not a threat to indigenous catfishes.
c) Steller's sea cow is an extinct animal.
d) Lantana is popularly known as carrot grass.
127. What is common to the techniques (i) in vitro fertilisation, (ii) Cryopreservation and (iii) tissue culture?
a) All are in situ conservation methods b) All are ex situ conservation methods.
c) All require ultra modern equipment and large space
d) All are methods of conservation of extinct organisms.
128. The extinction of passenger pigeon was due to
a) increased number of predatory birds b) over exploitation by humans
c) non-availability of the food d) bird flu virus infection.
129. Which animal has become extinct from India?
a) Snow leopard b) Hippopotamus c) Wolf d) Cheetah
130. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Species with low genetic variability are generally at greater risk of extinction than the species with more genetic variability.
Reason: Species with low genetic variability are more vulnerable to diseases, predators or other environmental challenges.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
131. Keystone species deserve protection because these
a) are capable of surviving in harsh environmental conditions
b) indicate presence of certain minerals in the soil
c) have become rare due to overexploitation
d) play an important role in supporting other species
132. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Offsite collections can be used to restock depleted populations, reintroduce

species in the wild and restore degraded habitats.

Reason: In situ conservation refers to the conservation of endangered species in their natural habitats.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false

133. Which of the below mentioned regions exhibit less seasonal variations?

a) Tropics b) Temperates c) Alpines d) Both (a) and (b)

134. Which of the following exotic species has become menace to many water bodies in India?

a) Lantana camara b) Eichhornia crassipes c) Panthenium hysterophorus
d) Eupatorium odoratum

135. A collection of plants and seeds having diverse alleles of all the genes of a crop is called _____.

a) herbarium b) germplasm c) gene library d) genome

136. Ranthambore National Park is situated in _____.

a) Maharashtra b) Rajasthan c) Gujarat d) UP

137. Biodiversity Act of India was passed by the parliament in the year

a) 1992 b) 1996 c) 2000 d) 2002

138. According to IUCN, when a taxon is facing an extremely high risk of extinction in the intermediate future, it is

a) Extinct in wild b) Endangered c) Critically endangered d) Vulnerable

139. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: Threatened species are those living species which have been greatly reduced in their number and are liable to become extinct if the causative factors continue.

Reason: IUCN is an international organisation which maintains the IUCN red list of threatened species, to assess the conservation status of different species

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false.

140. Where among the following will you find pitcher plant?

a) Rainforest of North-East India b) Sunderbans c) Thar Desert d) Western Ghats

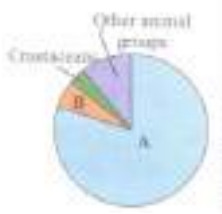
141. Which of the following is a reason for the greater biological diversity of tropical regions?
- a) Tropical latitudes have remained almost undisturbed for millions of years
 - b) Tropical environments are less seasonal, relatively more constant and predictable.
 - c) More solar energy is available in the tropics, resulting in high productivity.
 - d) All of these
142. Threats to biodiversity comes from
- a) Habitat loss b) Over exploitation c) Intensive agriculture d) All of these
143. What is the total number of species present on earth as estimated by Robert May?
- a) 3 million b) 5 million c) 7 million d) 9 million
144. Read the given statements and select the correct option.
- Statement 1:** Indian elephants (Elephan maximums) are confined to terai and the foothills.
- Statement 2:** Elephants are herbivores and require succulent grass and plenty of water.
- a) Both statements 1 and 2 are correct
 - b) Statement 1 is correct but statement 2 is incorrect.
 - c) Statement 1 is incorrect but statement 2 is correct
 - d) Both statements 1 and 2 are incorrect
145. Red list contains data or information on :
- a) Threatened species b) Marine vertebrates only
 - c) All economically Important plants
 - d) Plants whose products are in international Trade
146. Species diversity increases as one proceeds from ____.
- a) high altitude to low altitude and high latitude to low latitude
 - b) low altitude to high altitude and high latitude to low latitude
 - c) low altitude to high altitude and low latitude to high latitude
 - d) high altitude to low altitude and low latitude to high latitude
147. One of the ex situ conservation methods for endangered species is
- a) wildlife sanctuaries b) biosphere reserves c) cryopreservation d) national parks.
148. Red Data Book deals with
- a) organisms on the verge of extinction b) endemic plants
 - c) organisms showing photoperiodism d) organisms that are extinct.
149. Which of the following is not an example of in situ conservation?
- a) Biosphere reserves b) National parks c) Wildlife sanctuaries d) Zoological parks
150. An important international effort or convention for biodiversity conservation is
- a) UNESCO b) IUCN c) IBWL d) NBPGR
151. The impact of loss of biodiversity include

- a) decline in plant production b) lowered resistance to environmental perturbations
c)
increased variability in ecosystem processes like plant productivity, water use, pest and disease cycles
d) all of these

152. The historic convention on Biological Diversity held in Rio de Janeiro in 1992 is known as:

- a) CITES Convention b) The Earth Summit c) G-16 Summit d) MAB Programme

153. Given pie diagram represents the proportionate number of species of major groups of invertebrates. Identify the groups A and B



- a) A = Insects, B = Molluscs b) A = Molluscs, B = Insects
c) A = Insects, B = Annelids d) A = Molluscs, B = Annelids

154. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: The species diversity present in a given community or habitat is referred to as alpha diversity.

Reason: Alpha diversity is usually expressed by species richness and species evenness in that community or habitat.

- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

155. Which of the following statements describe natural extinction?

- (i) Extinctions abetted by human activities
(ii) Slow replacement of existing species
(iii) Also known as background extinction
(iv) A small population is most likely to be extinct
a) (i) and (ii) b) (i), (ii) and (iii) c) (ii), (iii) and (iv) d) (i), (ii), (iii) and (iv)

156. Match the items given in Column I with those in Column II and select the correct option given below.

Column - I	Column - II
1. Herbarium	i. It is a place having a collection of preserved plants and animals.

2. Key	ii. A list that enumerates methodically all the species found in an area with brief description aiding identification.
3. Museum	iii. It is a place where dried and pressed plant specimens mounted on sheets are kept.
4. Catalogue	iv. A booklet containing a list of characters and their alternate of various texts.

a) ii iv iii i b) iii ii i iv c) i iv iii ii d) iii iv i ii

157. Which of the following pairs of an animal and a plant represents endangered organisms in India?
 a) Tamarind and Rhesus monkey b) Cinchona and leopard
 c) Banyan and blackbuck d) Bentinckia nicobarica and Red Panda
158. Number of red list categories prepared by WCU (IUCN) is:
 a) 6 b) 7 c) 8 d) 12
159. How many hot spots cover India's high biodiversity regions?
 a) 25 b) 3 c) 34 d) 2
160. Tiger is not a resident in which one of the following National park?
 a) Sunderbans b) Gir c) Jim Corbett d) Ranthambhor
161. One of the most important functions of botanical gardens is that _____.
 a) they provide a beautiful area for recreation b) one can observe tropical plants there
 c) they allow ex-situ conservation of germplasm
 d) they provide the natural habitat for wildlife
162. According to IUCN Red List, what is the status of Red Panda (*Ailurus fulgens*)?
 a) Critically endangered species b) Vulnerable species c) Extinct species
 d) Endangered species
163. Nanda Devi biosphere reserve is found in
 a) Uttaranchal b) Assam c) Himachal Pradesh d) Andhra Pradesh.
164. Amazon rainforests are considered as 'lungs of the planet' as they contribute _____ of the total oxygen in the earth's atmosphere.
 a) 10% b) 15% c) 20% d) 30%
165. Which one of the following is an example of Ex-situ conservation?
 a) Wildlife sanctuary b) Seed bank c) Sacred groves d) National park
166. Which of the following is not an objective of Convention of Biodiversity?
 a) Conservation of biodiversity b) Sustainable use of biodiversity
 c) Fair and equitable sharing of benefits arising out of genetic resources
 d) Selective hunting of dangerous and threatening species
167. The Earth Summit held in Rio de Janeiro in 1992 was called _____.

- a) for conservation of biodiversity and sustainable utilisation of its benefits.
 b) to assess threat posed to native species by invasive weed species.
 c) for immediate steps to discontinue use of CFCs that were damaging the ozone layer.
 d) to reduce CO₂ emissions and global warming.
168. On a logarithmic scale, the species area relationship is a straight line described by the equation $\log S = \log C + Z \log A$. What does S, C, Z and A represent in the given equation? Select the correct answer from the codes given below.
- Species richness 1
 Slope of the line = 2
 Y - intercept = 3
 Area = 3
- a)

1	2	3	4
C	S	Z	A

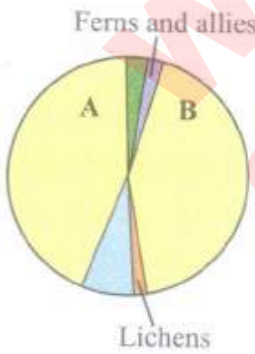
 b)

1	2	3	4
S	Z	C	A

 c)

1	2	3	4
Z	S	C	A

 d)

1	2	3	4
A	C	S	Z
169. A number of natural reserves have been created to conserve specific wildlife species. Identify the correct combination from the following.
- a) Gir forest - Tiger b) Kaziranga - Elephants c) Rann of Kutch - Wild ass
 d) Muru, Wildlife Sanctuary - Musk deer
170. Which is not a reason of maximum diversity in tropics?
- a) Higher pest pressure b) Evolutionary older zone
 c) More productivity due to more solar radiation d) Greater seasonal variations
171. Identify the groups of organism marked A and B in the given pie diagram representing the proportionate number of species of major taxa of plants.
- 
- a) A - Bryophytes, B - Gymnosperms b) A - Fungi, B - Gymnosperms
 c) A - Fungi, B - Angiosperms d) A - Algae, B - Angiosperms
172. Which of the following forests is known as the 'lungs of the planet earth'?
- a) Taiga forest b) Tundra forest c) Amazon rainforest
 d) Rainforests of North East India
173. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
- Assertion:** Tropical regions have got a long evolutionary time for species diversification

as compared to temperate regions.

Reason: Temperate regions have undergone frequent glaciations in the past whereas tropical regions have remained relatively undisturbed for millions of years

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

174. For frugivorous birds and mammals in the tropical forests of different continents, the slope is found to be

a) 0.6 b) 1.3 c) 1.15 d) 1.7

175. What is common to the seed banks, orchards, tissue culture and cryopreservation?

a) All are in situ conservation methods. b) All are ex situ conservation methods.

c) All require ultramodern equipment and very large space.

d) All are methods of conservation of extinct organisms.

176. Introduction of Nile Perch in lake Victoria of South Africa resulted in

a) excessive growth of water weeds b) elimination of water weeds

c) elimination of many species of cichlid fish d) excessive growth of cichlid fish.

177. Which one of the following has maximum genetic diversity in India?

a) Mango b) Wheat c) Tea d) Teak

178. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: If the species-area relationships are analysed among very large areas like the entire continents, the value of Z , i.e., slope of line lies in the range of 0.1 to 0.2.

Reason: The value of Z , i.e., slope of line of species area relationships lies in the range of 0.6 to 1.2 when analysis is done among small areas.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false.

179. What is common to Lantana, Eichhornia and African catfish?

a) All are endangered species of India. b) All are keystone species

c) All are mammals found in India.

d) All the species are neither threatened nor indigenous species of India

180. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: The Nile perch introduced into lake Victoria in East Africa led to the extinction of an ecologically unique assemblage of more than 200 species of cichlid fish in the lake.

Reason: When alien species are introduced deliberately for economic or other uses, they often become invasive and cause extinction of indigenous species

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false.

181. Fill in the blanks with the most appropriate option. The values of z lies in the range of _____ regardless of the taxonomic group or the region.

a) 0.1 to 0.2 b) 0.3 to 0.8 c) 0.1 to 1.0 d) 0.6 to 1.8

182. Which one of the following is related to Ex-situ conservation of threatened animals and plants?

a) Wildlife Safari parks b) Biodiversity hot spots c) Amazon rainforest
d) Himalayan region

183. Which of the following fish led to the extinction of an ecologically unique assemblage of more than 200 species of cichlid fish in the lake Victoria of E.Africa?

a) Catla Catla b) Dog fish c) Nile perch d) African catfish

184. Which of the following is the main factor of desertification?

a) Tourism b) Irrigated agriculture c) Overgrazing d) All of these

185. Bali, Javan and Caspian are

a) species of tiger b) species of Cheetah c) subspecies of cheetah
d) subspecies of tiger

186. Maximum nutritional diversity is found in the group _____.

a) Fungi b) Animalia c) Monera d) Plantae

187. Genetic variations affect the production of the drug reserpine in the medicinal plant *Rauwolfia vomitoria* growing in different Himalayan ranges. What kind of diversity does it indicate?

a) Species diversity b) Genetic diversity c) Ecological diversity d) None of these

188. India relishes a history of religious and cultural traditions which emphasised the protection of nature. In many cultures, tracts of forest were set aside, all the trees and wildlife within were venerated and given total protection. Such areas are referred to as

a) hotspots b) ethical groves c) sacred groves d) protected areas

189. Which is not true regarding genetic diversity?

- a) It enables a population to adapt to its environment b) It is also basis of speciation
c) Ecotype formation depends upon it d) Higher diversity increases uniformity

190. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Lungs of the planet	(i) Lantana camara
B. Reserpine	(ii) Amazon rainforests
C. Anti-cancer drug	(iii) Yew tree
D. Exotic species	(iv) Rauwolfia

- a) A-(ii), B-(iv), C-(iii), D-(i) b) A-(ii), B-(iii), C-(iv), D-(i) c) A-(iv), B-(iii), C-(i), D-(ii)
d) A-(ii), B-(iv), C-(i), D-(iii)

191. Which of the following countries has the highest biodiversity?

- a) Brazil b) South Africa c) Russia d) India

192. Character of a stable community is that it

- a) should not show too much variations in year-to-year productivity
b) must be resistant to occasional natural or manmade disturbances
c) should be resistant to invasions by alien species d) all of these

193. First biosphere reserve was established in 1986 at

- a) Nilgiri b) Nanda Devi c) Rann of Kutch d) Sunderbans.

194. Cryopreservation of gametes of threatened species in viable and fertile condition can be referred to as:_____.

- a) Advanced ex-situ conservation of biodiversity.
b) In situ conservation by sacred groves. c) In situ cryo conservation of biodiversity.
d) In situ conservation of biodiversity.

195. Match column I with column II and select the correct option from the given codes

Column I	Column II
A. Rhinoceros	(i) High endemism
B. In situ conservation	(ii) Off site conservation
C. Ex situ conservation	(iii) On site conservation
D. Hotspots	(iv) Kaziranga

- a) A-(iv), B-(iii), C-(ii), D-(i) b) A-(iv), B-(i), C-(ii), D-(iii) c) A-(iv), B-(ii), C-(iii), D-(i)
d) A-(iv), B-(i), C-(iii), D-(ii)

196. Reason of diversity in living beings is due to _____.

- a) mutation b) long term evolutionary change c) gradual change
d) short term evolutionary change

197. In India, we find mangoes with different flavours, colours, fibre content, sugar content and even shelf-life. The large variation is on account of

- a) species diversity b) induced mutations c) genetic diversity d) hybridisation

198. Conservation in the natural habitat is

- a) in situ b) ex situ c) zoo d) botanical garden

199. Symbol of WWF is

- a) tiger b) Rhododendron c) white bear d) giant panda.

200. Which is not a criteria used for determining hot spots?

- a) Number of endemic species b) Degree of habitat destruction
c) Having traditional strategy for protection of biodiversity d) Degree of exploitation

201. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as

Assertion: Genetic variation shown by the plant *Rauwolfia vomitoria* growing in different Himalayan ranges is very important economically.

Reason: The amount and variety of alkaloids present in this plant, change both between the *Rauwolfia* species and between the different strains of *R. vomitoria*.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false.

202. Which one of the following fish is being illegally introduced for aquaculture purposes and is posing a threat to the indigenous catfishes of Indian rivers?

- a) *Clarias gariepinus* b) Nile perch c) Climbing perch d) *Protopterus*

203. Match the animals given in column A with their location in column B.

	Column A		Column B
A.	Dodo	(i)	Africa
B.	Quagga	(ii)	Russia
C.	Thylacine	(iii)	Mauritius
D.	Stellar's sea cow	(iv)	Australia

Choose the correct match from the following.

- a) i-A, ii-C, iii-B, iv-D b) i-D, ii-C, iii-A, iv-B c) i-C, ii-A, iii-B, iv-D
d) i-C, ii-A, iii-D, iv-B

204. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Beta diversity	(i) Tropical areas
B. Rich biodiversity	(ii) Dodo
C. Gamma diversity	(iii) Between community diversity
D. Extinct species	(iv) Great Indian bustard
E. Critically endangered species	(v) Diversity of whole geographical region

- a) A-(v), B-(i), C-(iii), D-(ii), E-(iv) b) A-(iii), B-(i), C-(v), D-(ii), E-(iv)
c) A-(iii), B-(i), C-(v), D-(iv), E-(ii) d) A-(v), B-(i), C-(iii), D-(iv), E-(ii)

205. A population characteristic of a species susceptible to extinction is
 a) Low trophic level in food chain b) Inability to switch over to alternate food source
 c) Wide range of distribution d) High biotic potential

206. Ten species (i) to (x) sampled in four areas A - D having 11 - 13 habitats (given in the brackets) possess populations (in thousands) given in the table. Which one has the maximum species diversity?

a)

		(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
A	(11)	1.2	1.2	0.52	-	-	3.1	1.1	9.0	-	10.3

b)

		(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
B	(12)	10.2	-	0.62	1.5	1.5	3.0	-	8.2	1.1	11.2

c)

		(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
C	(13)	11.3	0.9	0.48	1.45	1.44	2.0	8.8	8.4	2.2	4.1

d)

		(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
D	(12)	3.2	10.2	11.1	0.4	0.43	3.3	0.8	7.3	11.3	2.1

207. Which one of the following pairs of organisms are exotic species introduced in India?

- a) Lantana camara, water hyacinth b) Water hyacinth, prosopis cineraria
 c) Nile perch, Ficus religiosa d) Ficus religiosa, Lantana camara

208. Which is not used for ex situ plant conservation?

- a) Botanical gardens b) Field gene banks c) Seed banks d) Shifting cultivation

209. Read the given statements and select the correct option.

Statement 1: Tropical rainforests are disappearing fastly from developing countries such as India.

Statement 2: No value is attached to these forests because these are poor in biodiversity.

- a) Both statements 1 and 2 are correct
 b) Statement 1 is correct but statement 2 is incorrect
 c) Statement 1 is incorrect but statement 2 is correct
 d) Both statements 1 and 2 are incorrect

210. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Jim Corbett National Park is the first National Park of India and is famous for

tigers

Reason: Though the main focus is protection of wildlife the reserve management has also encouraged ecotourism in this national park.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

211. World Summit on Sustainable Development (2002) was held in _____.

a) Brazil b) Sweden c) Argentina d) South Africa

212. When a taxon is facing a very high risk of extinction in the wild in the near future is

a) Threatened species b) Rare species c) Vulnerable species
d) Endangered species

213. How many hot spots of biodiversity in the world have been identified till date by Norman Myers?

a) 17 b) 25 c) 34 d) 43

214. Cryopreservation is the preservation of germplasm at very low temperature of around:

a) -121°C b) -196°C c) 0°C d) -101°C .

215. Select the incorrectly matched pair

a) UNESCO= United Nations Educational Scientific and Cultural Organisation
b) CITES= Convention in International Trade in Elite Species
c) IUCN = International Union of Conservation for Nature and Natural Resources
d) WWF = World Wide Fund for Nature

216. Biodiversity Act of India was passed by the parliament in the year _____.

a) 1992 b) 1996 c) 2000 d) 2002

217. The diversity of organisms sharing the same habitat or community is termed as

a) alpha diversity b) beta diversity c) gamma diversity d) delta diversity.

218. The one-horned rhinoceros is specific to which of the following sanctuaries?

a) Bharatpur b) Vedanthgol c) Kaziranga d) Corbett Park

219. How many species became extinct in last 500 years?

a) 338 b) 359 c) 784 d) 2000

220. MAB Programme means

a) Man and biosphere programme b) Man and biodiversity conservation programme
c) Manually aided biosphere conservation programme d) None of these.



RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins

ENVIRONMENTAL ISSUES 1

Marks : 1057

1. High concentration of greenhouse gases has resulted in maximum rise of atmospheric temperature in
a) tropic region b) middle latitude c) polar region d) temperate region
2. Green muffler scheme helps to reduce
a) air pollution b) noise pollution c) e-wastes d) both (a) and (b).
3. Depletion of which gas in the atmosphere can lead to an increased incidence of skin cancers?
a) Methane b) Nitrous oxide c) Ozone d) Ammonia
4. Eutrophication is often seen in _____.
a) deserts b) fresh water lakes c) ocean d) mountains
5. The amount of biodegradable organic matter in sewage water can be estimated by measuring:
a) biochemical oxygen demand b) the growth of anaerobic bacteria in water
c) biogeological oxygen demand d) the growth of aerobic bacteria in water
6. Which is not an effect of acidic rain in a pond?
a) Increased fungal growth b) Decreased insect population
c) Increased growth of green algae d) NO_3^- & SO_4^{2-} saturation
7. In the event of global warming, which one of the following is most likely to occur?
a) Existing plant and animal communities will move North in response to warming.
b)
Agriculture in the Prairie provinces will be redeveloped on soils of the Canadian Shield.
c)
The anticipated rise in sea level will be caused primarily by the melting of polar ice caps.
d)
The decomposition of organic matter in the unfrozen surface layer of polar soils will increase.
8. Acid rains are produced by

- a) excess NO_x and SO_2 from burning fossil fuels
 - b) excess production of NH_3 by industries and power plants
 - c) excess release of carbon monoxide by incomplete combustion of fossil fuels
 - d) excess release of CO_2 by combustion and animal respiration.
9. DDT residues are rapidly passed through food chain causing biomagnification because DDT is:
- a) water soluble b) lipid soluble c) moderately toxic
 - d) non-toxic to aquatic animals.
10. A sewage treatment process in which a portion of the decomposer bacteria present in the waste is recycled into the beginning of the process, is called ____.
- a) cyclic treatment b) primary treatment c) activated sludge treatment
 - d) tertiary treatment
11. Read the given statements and select the correct option.
- Statement 1** : Irrigation without proper drainage of water leads to waterlogging in the soil.
- Statement 2** : Waterlogging draws salts to the soil surface, which are deposited as a thin crust on the land surface or start collecting at the roots of the plants.
- a) Both statements 1 and 2 are correct.
 - b) Statement 1 is correct but statement 2 is incorrect.
 - c) Statement 1 is incorrect but statement 2 is correct.
 - d) Both statements 1 and 2 are incorrect.
12. Green-house effect is warming due to ____.
- a) infra-red rays reaching earth b) moisture layer in atmosphere
 - c) increase in temperature due to increase in carbon dioxide concentration of atmosphere
 - d) ozone layer of atmosphere
13. The controlled aerobic combustion of wastes inside chambers at temperature of 900-1300°C is known as
- a) Incineration b) Recycling c) Pyrolysis d) Sanitary dumping
14. High value of BOD (Biochemical Oxygen Demand) indicates that ____.
- a) Water is highly Polluted. b) Water is less Polluted.
 - c) Consumption of organic matter in the water is higher by the microbes.
 - d) Water is Pure
15. The supersonic jets cause pollution by the thinning of ____.
- a) CO_2 layer b) SO_2 layer c) O_2 layer d) O_3 layer
16. Scrubber in the exhaust of a chemical industrial plant removes:

- a) Gases like sulphur dioxide
 - b) Particulate matter of the size 5 micrometre or above
 - c) Gases like ozone and methane
 - d) Particulate matter of the size 2.5 micrometre or less
17. Montreal protocol was passed in:
- a) 1985 b) 1986 c) 1987 d) 1988
18. Which of the following actions can be taken to control noise pollution?
- a) Delimitation of horn-free zone around hospitals and schools
 - b) Permissible sound-levels of crackers and of loudspeakers
 - c) Set the timing after which loudspeakers cannot be played d) All of these
19. Which one of the following is not a bioindicator of water pollution?
- a) Blood-worms b) Stone flies c) Sewage fungus d) Sludge-worms
20. A river with inflow of domestic sewage rich in organic waste may result:
- a) Increased population of aquatic food web organisms
 - b) Death of fish due to lack of oxygen
 - c) Drying of the river very soon due to algal bloom
 - d) Increased population of fish due to biodegradable nutrients
21. Soil fertility is depleted due to
- a) Pan breaking b) Terracing c) Intensive agriculture d) Contour Bunding
22. Which of the following is absent in polluted water?
- a) Hydrilla b) Water hyacinth c) Larva of stonefly d) Blue-green algae
23. Identify the incorrectly matched pair.
- a) Chipko movement - Protection of trees b) Kyoto protocol - Climatic change
 - c) Montreal protocol - Forest conservation
 - d) Ramsar convention - Conservation and sustainable utilisation of wetlands
24. Most hazardous metal pollutant of automobile exhausts ____.
- a) mercury b) cadmium c) lead d) copper
25. Which of the following is the way to control vehicular air- pollution in Indian cities?
- a) Use of CNG as fuel b) Use of unleaded petrol in the vehicles
 - c) Use of catalytic converter in the vehicles d) All of these
26. Chipko movement was launched for the protection of ____.
- a) forests b) livestock c) wetlands d) grasslands
27. Match the items given in Column I with those in Column II and select the correct option given below:

Column I	Column II
(A) Entrophication	(i) UV-Bradiation

(B) Sanitary landfill	(ii) Deforestation
(C) Snow blindness	(iii) Nutrient enrichment
(D) [hum cultivation	(iv) Waste disposal

a)

A	B	C	D
(iii)	(iv)	(i)	(ii)

b)

A	B	C	D
(i)	(iii)	(iv)	(ii)

c)

A	B	C	D
(ii)	(i)	(iii)	(iv)

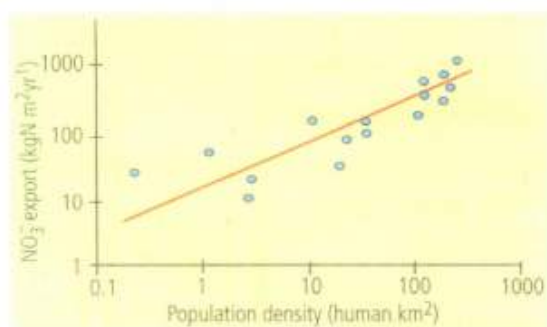
d)

A	B	C	D
(i)	(ii)	(iv)	(iii)

28. Photochemical Smog possess oxides of
a) Sulphur b) Nitrogen c) Carbon d) Phosphorus
29. Noise cause
a) headache by constricting blood vessels of the brain
b) eye strain by constricting the pupil c) digestive spasms through anxiety
d) high blood pressure by decreasing cholesterol level in the blood.
30. Which one of the following diseases is not due to contamination of water?
a) Hepatitis-B b) Jaundice c) Cholera d) Typhoid
31. Presence of E.coli in water indicates
a) Water is clear b) Water is fully polluted c) Inorganic pollution
d) Faecal pollution
32. Assertion: Deforestation increases carbon dioxide concentration in the atmosphere.
Reason: Deforestation may lead to desertification.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
33. Which of the following is the most important cause for animals and plants being driven to extinction?
a) Drought and floods b) Economic exploitation c) Alien species invasion
d) Habitat loss and fragmentation
34. Release of phosphates and nitrates in water bodies (i.e., in rivers and lakes) leads to
a) Biomagnification b) Reduced algal growth c) Increased algal growth
d) Increased growth of decomposers
35. Which of the following is not used for disinfection of drinking water?

- a) Chlorine b) Ozone c) Chloramine d) Phenyl

36. The given graph shows how much nitrate (NO_3^-) is exported from the continent towards the ocean by 16 major rivers in the world compared to the density of human populations living along those drainage basins (i.e., along these rivers). What interpretation can be drawn from this graph?



- a)
Nitrate exported through rivers from heavily populated cities can cause eutrophication and toxic algal bloom in marine coastal regions.
- b) Small drainage basins export more NO_3^-
- c) Drainage basins with higher population densities export lesser NO_3^-
- d) Both (a) and (c)
37. Photochemical smog
- a) Heat emission due to bomb explosion
- b) Production of useful ecological effect by a previously useful chemical
- c) Formation of secondary pollutant from reaction of primary pollutants
- d) Production of adverse ecological effect by a previously useful chemical
38. Peroxyacyl nitrates (PAN) are formed through photo - photochemical reactions between
- a) sulphur oxides and hydrocarbons b) nitrogen oxides and hydrocarbons
- c) nitrogen oxides and O_3 d) CFCl_3 and O_3
39. Measuring Biochemical Oxygen Demand (BOD) is a method used for ____.
- a) estimating the amount of organic matter in sewage water.
- b) working out the efficiency of oil driven automobile engines.
- c)
measuring the activity of *Saccharomyces cerevisiae* in producing curd on commercial scale.
- d) working out the efficiency of RBCs about their capacity to carry oxygen.
40. Read the given statements and select the correct option.
- Statement 1 :** Traffic jams are likely to cause giddiness, exhaustion, reduced vision, etc.

Statement 2 : Carbon monoxide from vehicles causes these problems by reducing the carrying capacity of haemoglobin.

- a) Both statements 1 and 2 are correct
- b) Statement 1 is correct but statement 2 is incorrect.
- c) Statement 1 is incorrect but statement 2 is correct.
- d) Both statements 1 and 2 are incorrect.

41. Which one of the following is a wrong statement?

- a) Most of the forests have been lost in tropical areas.
- b) Ozone in upper part of atmosphere is harmful to animals.
- c) Greenhouse effect is a natural phenomenon.
- d) Eutrophication is a natural phenomenon in freshwater bodies

42. Which one of the following organism is used as indicator of water quality?

- a) Beggiatoa b) Chlorella c) Azospirillum d) Escherichia

43. Assertion: Bharat stage IV emission norms have been in place since April 2010, for 4 wheelers in 13 mega cities of India.

Reason: Green muffler scheme refers to the plantation of trees and shrubs along road sides and is effective to control noise pollution only.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

44. A disease caused by eating fish contaminated by industrial waste, containing mercury compounds, is called as

- a) osteosclerosis b) Hashimoto's disease c) Bright's disease
- d) Minamata disease.

45. In stratosphere, which of the following elements acts as a catalyst in degradation of ozone and release of molecular oxygen

- a) Fe b) Cl c) Carbon d) Oxygen

46. Compressed Natural Gas (CNG) is:

- a) propane b) methane c) ethane d) butane

47. Global agreement in specific control strategies to reduce the release of ozone-depleting substances, was adopted by _____.

- a) the Montreal Protocol. b) the Kyoto Protocol. c) the Menna Convention.
- d) rio de Janeiro Conference.

48. Spraying of pesticide is an example of
a) Point source water pollution b) Diffuse water pollution c) Both (1) & (2)
d) Pyrolysis
49. Which important greenhouse gas, other than methane, is being produced from the agricultural fields?
a) Arsine b) Sulphur dioxide c) Ammonia d) Nitrous oxide
50. Motor vehicles equipped with catalytic converter are advised to use unleaded petrol because
a) lead is a heavy metal b) lead causes inactivation of catalyst
c) lead decreases the efficiency of vehicle d) lead increases burning of petrol.
51. Which of the following are the correct approaches to reduce global warming?
(i) Use of fossil fuels
(ii) Improving efficiency of energy usage
(iii) Afforestation
(iv) Increasing growth of human population
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (i), (ii) and (iii)
52. Oil spills causes mass scale death of fishes due to
a) Clogging of gills b) Disruption of food chain c) Non-availability of food
d) All of these
53. Acoustic zoning is related with
a) Soil pollution b) Noise pollution c) Water Pollution d) Solid waste
54. Phosphate pollution is brought about by
a) phosphate rocks b) automobile exhausts c) sewage and phosphate rocks
d) sewage and agricultural fertilisers.
55. Read and select the incorrect option about desertification.
a) A desert is created when barren patches of land meet.
b) Desertification is the result of increased urbanisation.
c) Deserts are arid patches of land.
d) Slash and burn method is one of the major cause of desertification.
56. The most common indicator organism that represents polluted water is _____.
a) E.coli b) P. typhi c) C. vibrio d) Entamoeba
57. Which of the following is mainly produced by the activity of anaerobic bacteria on sewage?
a) Laughing gas b) Propane c) Mustard gas d) Marsh gas
58. Which of the following statements is correct?

a) There are working 'Ecosan' toilets in many areas of Kerala and Sri Lanka.

b)

Municipal solid wastes are wastes from homes, offices, stores, schools, hospitals, etc., that are collected and disposed by the municipality.

c)

In a sanitary landfill, wastes are dumped in a depression or trench after compaction and covered with dirt everyday.

d) All of these

59. Which of the following isotopes is most dangerous to human beings?

a) Phosphorus-32 b) Strontium-90 c) Caesium-137 d) Iodine-131

60. Corrosion of Taj Mahal is due to the conversion of CaCO_3 into

a) CaSO_4 and CaNO_3 b) Ca(OH)_2 c) CaO d) All of these

61. _____ is highly hazardous to animal health but on plants this gas does not seem to show adverse effect.

a) CO b) CO_2 c) SO_2 d) NO_2

62. In stratosphere, which one of the following elements acts as a catalyst in degradation of ozone and release of molecular oxygen?

a) Fe b) Cl c) Carbon d) Oxygen

63. Which of the following is not one of the prime health risks associated with greater UV radiation through the atmosphere due to depletion of stratospheric ozone?

a) Reduced Immune System b) Damage to eyes c) Increased liver cancer
d) Increased skin cancer

64. Match correctly the following and choose the correct option.

i	Environment Protection Act	A	1974
ii	Air Prevention and Control of Pollution Act	B	1987
iii	Water Act	C	1986
iv	Amendment of Air Act to include noise	D	1981

a) A -(iii), B-(iv), C-(i), D-(ii) b) A-(i), B-(iii), C-(ii), D-(iv)

c) A-(iv), B-(i), C-(ii), D-(iii) d) A-(iii), B-(iv), C-(ii), D-(i).

65. Which of the following statements are incorrect regarding the Euro II norms?

a) It stipulates that sulphur be controlled at 350 ppb in diesel.

b) It stipulates that sulphur be controlled at 150 ppm in petrol.

c) Aromatic hydrocarbons are to be contained at 42% of the concerned fuel.

d) None of these

66. Assertion: Cultural eutrophication is nutrient enrichment of water bodies due to human activities like passage of sewage, industrial effluents, etc.
Reason: The prime contaminants from sewage and industrial effluents are nitrates and phosphates, which act as plant nutrients and overstimulate the growth of algae.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
67. Assertion: Montreal protocol, was signed at Montreal (Canada) in 1987 to control the emission of ozone depleting substances.
Reason: Kyoto protocol, held in Kyoto (Japan) in 1997, has specified the commitments of different countries to mitigate climate change.
- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
- b)
If both assertion and reason are true but reason is not the correct explanation of assertion
- c) If assertion is true but reason is false. d) If both assertion and reason are false.
68. Which of the following pairs of gases is mainly responsible for green house effect?
a) Oxygen and Nitrogen b) Nitrogen and Sulphur dioxide
c) Carbon dioxide and Methane d) Ozone and Ammonia
69. The expanded form of DDT is
a) dichloro diphenyl trichloroethane b) dichloro diethyl trichloroethane
c) dichloro dipyrydyl trichloroethane d) dichloro diphenyl tetrachloroacetate
70. Which of the following statements is not correct regarding biomagnification?
(i) Mercury accumulated by an organism cannot be metabolised.
(ii) In the process of biomagnification, concentration of DDT is increased at successive trophic levels.
(iii) Accumulation of cadmium can cause thinning of egg shell in birds.
(iv) DDT accumulation is a major cause of reduced population of fish eating birds.
(v) Biomagnification occurs only in aquatic food chain.
- a) (i), (iii) and (v) b) (iii) and (iv) c) (iii) and (v) d) (i), (ii) and (iv)
71. Algal blooms impart a distinct colour to water due to

- a)
formation of coloured chemicals in water facilitated by physiological degradation of algae
- b) absorption of light by algal cell wall. c) their pigments
d) excretion of coloured substances
72. Which one of the following statements is not valid for aerosols?
a) They are harmful to human health b) They alter rainfall and monsoon patterns
c) They cause increased agricultural productivity
d) They have negative impact on agricultural land
73. The major source of noise pollution, worldwide is due to
a) office equipment b) transport system c) sugar, textile and paper industries
d) oil refineries and thermal power plants.
74. dB is a standard abbreviation used for the quantitative expression of _____.
a) the density of bacteria in a medium b) a particular pollutant
c) the dominant Bacillus in a culture d) a certain pesticide
75. Which of the following statements regarding eutrophication are correct?
(i) Eutrophication is the natural ageing of a lake by nutrient enrichment of its water.
(ii) Pollutants from human activities like effluents from the industries and homes can radically accelerate the aging process of a lake. This phenomenon is called as cultural or accelerated eutrophication.
(iii) The plant nutrients responsible for eutrophication are nitrates and phosphates.
(iv) These phosphates and nitrates accelerate the growth of algae, which utilise oxygen and may deoxygenate the water to kill the fish and other aquatic animals.
a) (i) and (ii) b) (iii) and (iv) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)
76. Minamata disease was caused due to the consumption of:
a) sea food containing lot of cadmium b) fish contaminated with mercury
c) oysters with lots of pesticides d) sea food contaminated with selenium
77. The zone of atmosphere in which the ozone layer is present is called _____.
a) Ionosphere b) Mesosphere c) Stratosphere d) Troposphere
78. More than 7 % of world's freshwater is /contained in _____.
a) polar ice b) glaciers and mountains c) Antarctica d) greenland
79. The major ozone depleting substance out of the following is:
a) CFCs b) O_2 c) nitrogen d) all of these
80. Global agreement to reduce the release of ODS is.
a) Vienna Convention b) Rio de Janeiro Conference c) Kyoto Protocol
d) Montreal Protocol

81. In the human-induced process called acid precipitation, the main biogeochemical cycles that are altered are the _____ cycles and one effect in lakes is to _____ population of nitrifying bacteria.
a) phosphorus and nitrogen, decrease b) nitrogen and sulphur, decrease
c) nitrogen and sulphur, increase d) phosphorus and sulphur, decrease
82. Which among the following is likely to have the highest levels of DDT deposition in its body?
a) Sea gull b) Phytoplankton c) Eel d) Crab
83. Match column I with column II and select the correct option from the given codes.
- | Column - I | Column -II |
|------------------------------|---------------------------------------|
| A Catalytic converter | i Used in industries and power plants |
| B Electrostatic precipitator | ii Used in automobiles |
| C Earmuffs | iii High noise level |
| D Land fills | iv Solid wastes |
- a) A-(i), B-(ii), C-(iii), D-(iv) b) A-(ii), B-(i), C-(iii), D-(iv)
c) A-(iv), B-(iii), C-(ii), D-(i) d) A-(iii), B-(ii), C-(iv), D-(i)
84. Read the following statements and select the correct ones.
(i) Ahmed Khan, a plastic sack manufacturer of Bangalore, in 1998, developed polyblend, a fine powder of recycled modified plastic.
(ii) In collaboration with RV College of Engineering and Bangalore City Corporation, he proved that the mixture of polyblend and bitumen was better for road carpeting as it had better water repellent property.
(iii) By 2002, more than 40 km roads of Bangalore were laid with the help of Khan's mixture.
(iv) Rag pickers who used to get Rs 0.40 per kg of plastic waste started getting Rs 6.00 from Ahmed Khan.
(v) Innovation like polyblend might help the modern society from being smothered with plastic waste.
a) (i), (ii) and (iii) b) (ii), (iv) and (v) c) (iii), (iv) and (v) d) All of these
85. A dental disease characterised by mottling of teeth is due to the presence of certain chemical element in drinking water. Which of the following is that element?
a) Fluorine b) Boron c) Mercury d) Chlorine
86. Non-biodegradable pollutants are created by
a) nature b) excessive use of resources c) humans d) natural disasters
87. A brief exposure to 150 dB sound may
a) damage ear drums b) cause permanent impairing hearing ability
c) cause temporary impairing hearing ability d) both (a) and (b).

88. Pollutant responsible for causing pheophytization is
a) SO_2 b) NO_x c) CO_2 d) Aeroallergens
89. Green house gases are
a) Absorbers of long-wave radiations from earth
b) Transparent to both solar radiations and longwave radiations from earth
c) Absorbers of incoming solar radiations for warming the atmosphere
d) Transparent to emissions from earth for passage into outer space
90. In an area where DDT had been used extensively, the bird population declined significantly due to
a) Birds stopped laying eggs b) Earthworms disappeared from the area
c) Many of the birds egg did not hatch
d) Snakes started feeding extensively on birds
91. Which of the following is referred to as the world's most problematic aquatic weed?
a) *Abelmoschus esculentus* b) *Eichhornia crassipes*
c) *Parthenium hysterophorus* d) Planktonic algae
92. Choose the incorrect statement.
a)
The Montreal protocol is associated with the control of emission of ozone depleting substances.
b) Methane and carbon dioxide are greenhouse gases.
c) Dobson units are used to measure oxygen content.
d) Use of incinerators is crucial to disposal of hospital wastes.
93. Waterlogging and soil salinity are some of the problems that have come in
a) Soil erosion b) White revolution c) Green revolution d) Blue revolution.
94. Minamata disease is due to
a) Oil spill in water b) Arsenic into the atmosphere
c) Industrial waste having mercury in water d) Organic waste into drinking water
95. Among the following which one causes more indoor chemical pollution?
a) Burning coal b) Burning cooking gas c) Burning mosquito coil
d) Room spray
96. Secondary sewage treatment is mainly a _____.
a) physical process b) mechanical process c) chemical process
d) biological process
97. Select the correct arrangement of the types of ultraviolet radiations according to the intensity of their effect on human skin.

- a) UV-A > UV-B > UV-C b) UV-B > UV-C > UV-A c) UV-C > UV-B > UV-A
d) UV-A > UV-C > UV-B

98. Which one is not a pollutant normally?

- a) Hydrocarbons b) Carbon dioxide c) Carbon monoxide d) Sulphur dioxide

99. Which of the following statements are correct?

- (i) Benzene hexachloride (BHC) is a non-biodegradable pollutant.
(ii) Anthropogenic air pollutants are natural in origin.
(iii) Carbon monoxide is a primary air pollutant.
(iv) Sulphur dioxide causes brown air effect during traffic congestion in cities.
a) (i) and (iii) b) (i) and (ii) c) (ii) and (iii) d) (ii) and (iv)

100. The effect of today's radioactive fallout will probably be more harmful to children of future generation than to present day children because

- a) infants are more susceptible to radiations
b) susceptibility to radiations increase with age
c) mutated genes are usually recessive d) all of these

101. Consider the following statements (i) - (iv) about organic farming:

- (i) Utilizes genetically modified crops like Bt cotton
(ii) Uses only naturally produced inputs like compost
(iii) Does not use pesticides and urea.
(iv) Produces vegetables rich in vitamins and minerals.

Which of the above statements are correct?

- a) (ii) and (iii) b) (i) and (ii) c) (ii), (iii) and (iv) d) (iii) and (iv)

102. Match column I with column II and select the correct option from the given codes.

Column - I	Column - II
A Bishnoi community	i Rajasthan
B Chipko movement	ii Reducethe emission of ozone depleting substances
C Montreal protocol	iii Garhwal Himalayas
D Kyoto protocol	iv Reducethe emission of greenhouse gases

- a) A-(i), B-(iii), C-(ii), D-(iv) b) A-(i), B-(iii), C-(iv), D-(ii)
c) A-(iii), B-(i), C-(ii), D-(iv) d) A-(iii), B-(i), C-(iv), D-(ii)

103. A prolonged exposure to noise at 95 dB can produce

- a) respiratory trouble b) skin cancer
c) nervous tension and increased blood pressure d) digestive spasm.

104. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A Mercury	i Methaemoglobinemia (or Blue baby syndrome)
B Nitrate	ii Black foot disease

	Column I	Column II
C	Arsenic	iii Itai-itai disease
D	Cadmium	iv Minamata disease

- a) A-(iv), B-(i), C-(ii), D-(iii) b) A-(iv), B-(i), C-(iii), D-(ii)
 c) A-(ii), B-(iii), C-(i), D-(iv) d) A-(ii), B-(iv), C-(i), D-(iii)

105. Why is it necessary to remove sulphur from petroleum products?
 a) To reduce the emission of sulphur dioxide in exhaust fumes.
 b) To increase efficiency of automobiles engines.
 c) To use sulphur removed from petroleum for commercial purposes.
 d) To increase the life span of engine silencers.
106. Increased asthmatic attacks in certain seasons are related to
 a) eating fruits preserved in tin containers b) inhalation of seasonal pollen
 c) low temperature d) hot and humid environment.
107. Which of the following is correct for infrared radiations?
 a) They are long wave radiations. b) They are short wave radiations
 c) They are visible radiations d) None of these.
108. In Minamata Bay of Japan, the animals which remained free from Minamata disease, are _____.
 a) pigs b) rabbits c) dogs d) cats
109. The concept of Joint Forest Management (JFM) involves
 a) conservation of forest and agricultural land by the government
 b) conservation of forest and agricultural land by the government
 c) work in close association with the local communities for protecting and managing forests
 d) exploitation of beneficial forest products only.
110. BOD in river water:
 a) Remains unchanged when algal bloom occurs
 b) Increases when sewage gets mixed up with river water
 c) Has no relationship with concentration of oxygen in water
 d) Give a measure for Salmonella in water
111. Assertion: Contribution of CO_2 , CH_4 , CFCs and N_2O towards greenhouse effect is respectively 60%, 6%, 14% and 20%.
 Reason: Greenhouse gases are radioactively active gases which prevent the short wavelength radiations emitted by earth to escape into space

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

112. Limit of BOD prescribed by Central Pollution Control Board for the discharge of industrial and municipal wastewaters into natural surface waters is _____.

a) < 10 ppm b) < 100 ppm c) < 30 ppm d) < 3.0 ppm

113. Which of the following can cause DNA damage and mutations in humans?

a) Absorption of UV-A and UV-B b) Absorption of UV-B c) Absorption of UV-A
d) Absorption of UV-A and UV-C

114. In India, Air (Prevention and Control of Pollution) Act came into force in the year 1981, but was amended in the year _____ to include _____ as an air pollutant.

a) 1990, noise b) 1984, particulate matter c) 1987, PAN d) 1987, noise

115. A lake with an inflow of domestic sewage rich in organic waste may result in

a) drying of the lake very soon due to algal bloom
b) an increased growth of fishes due to lot of nutrients
c) death of fish due to lack of oxygen
d) increased population of aquatic food web organisms.

116. Which one of the following is the correct percentage of the two (out of the total of 4) greenhouse gases that contribute to the total global warming?

a) CFCs 14%, Methane 20% b) CO₂, 40%, CFCs 30% c) N₂O 6%, CO₂ 86%
d) Methane 20%, N₂O 18%

117. If there was no CO₂ in the earth's atmosphere the temperature of earth's surface would be _____.

a) same as present b) less than the present c) higher than the present
dependent on the amount of oxygen in the
d) atmosphere

118. Find odd one out w.r.t. e-waste importers

a) India b) Pakistan c) China d) America

119. Assertion: Evencs refers to a scientific method of treating e-wastes in an environment friendly manner.

Reason: Recycling of e-wastes in developed countries often involves manual participation and exposes the workers to toxic substances present in e-wastes.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

120. Some statements are given below each with one or two blanks. Select the option that correctly fills up the blanks.

(i) High concentration of DDT disturbs _____ in birds, which causes _____.

(ii) _____ burns more efficiently as compared to petrol and diesel.

(iii) _____ is the natural ageing of a lake which occurs due to accumulation of _____.

(iv) _____ reduces the number of organisms which are sensitive to high temperature.

(v) Irreparable computers and other electronic goods are known as _____.

a)

(i) calcium metabolism, thinning of egg shell (ii) CNG (iii) Eutrophication, nitrates and phosphates (iv) Thermal wastewater (v) electronic waste

b)

(i) protein metabolism, thickening of egg shell (ii) CNG (iii) Eutrophication, nitrates and phosphates (iv) Thermal wastewater (v) electronic waste

c)

(i) calcium metabolism, thinning of egg shell (ii) Coal (iii) Biomagnification, nitrates and phosphates (iv) Organic wastewater (v) inorganic waste

d)

(i) calcium metabolism, thickening of egg shell (ii) CNG (iii) Biomagnification, DDT and mercury (iv) Thermal wastewater (v) electronic waste

121. Ozone depletion is occurring widely in

a) troposphere b) stratosphere c) ionosphere d) all of these

122. Formation of ozone hole is maximum over _____.

a) India b) Antarctica c) Europe d) Africa

123. Snow - blindness in Antarctic region is due to _____.

a) High reflection of light from snow b) Damage of retina caused by infra-red rays
c) Freezing of fluids in the eye by low temperature
d) Inflammation of cornea due to high dose of UV-B radiation

124. A location with luxuriant growth of lichens on the trees indicates that the _____.

a) trees are very healthy. b) trees are heavily infested.

c) location is highly polluted. d) location is not polluted

125. Chlorofluorocarbons are air polluting agents which are produced by

a) diesel trucks b) jet planes c) rice fields d) cellphones

126. Assertion: There is a sharp decline in dissolved oxygen downstream from the point of sewage discharge.

Reason: Microorganisms involved in biodegradation of organic matter in the receiving water body consume a lot of oxygen.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

127. When huge amount of sewage is dumped into a river, its BOD will _____.

a) increase b) decrease c) sharply decrease d) remain unchanged

128. Assertion: A brief exposure to extremely high sound level, 150dB or more generated by take off of a jet plane or rocket, may damage ear drum or dislocate ear ossicles and permanently impair the hearing ability.

Reason: In India, the Air (Prevention and Control of Pollution) Act came into force in 1981, but was amended in 1987 to include noise as an air pollutant.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false

129. A lake near a village suffered heavy mortality of fishes within a few days. Consider the following reasons for this?

1. Lots of urea and phosphate fertiliser were used in the crops in the vicinity.

2. The area was sprayed with DDT by an aircraft.

3. The lake water turned green and stinky.

4. Phytoplankton populations in the lake declined initially thereby greatly reducing photosynthesis.

Which two of the above were the main causes of fish mortality in the lake?

a) (2) and (3) b) (3) and (4) c) (1) and (3) d) (1) and (2)

130. The major contributor of green-house gases to the atmosphere is _____.
a) Russia b) USA c) Germany d) Brazil
131. Which of the following causes biomagnification?
a) SO_2 b) Mercury c) DDT d) Both (b) and (c)
132. Sewage drained into water bodies kill fishes because _____.
a) excessive carbon dioxide is added to water b) it gives off a bad smell
c) it removes the food eaten by fish
d) it increases competition with fishes for dissolved oxygen
133. Which one of the following statements is wrong in case of Bhopal tragedy?
a) Methyl Isocyanate gas leakage took place.
b) Thousands of human beings died. c) Radioactive fall out engulfed Bhopal.
d) It took place in the night of December 2/3 1984.
134. Prolonged liberal irrigation of agricultural fields is likely to create the problem of _____.
a) Acidity b) Aridity c) Salinity d) Metal toxicity
135. Acid rain is due to
a) O_3 , PAN b) Oxides of nitrogen and sulphur c) Green house effect
d) All of these
136. The dB is a standard abbreviation used for the quantitative expression of:
a) A particular pollutant b) The dominant Bacillus in a culture
c) A certain pesticide d) The density of bacteria in a medium
137. In coming years, skin-related disorders will be more common due to _____.
a) air pollution b) use of detergents c) water pollution
d) depletion of ozone layer
138. Read the given statements and select the correct option.
Statement 1 : Reforestation is the process of restoring a forest that once existed but was removed at some point of time in the past.
Statement 2 : Reforestation may occur naturally in a deforested' area, however it can be speeded up by planting trees with due consideration to biodiversity that earlier existed in that area.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
139. Steps taken by the Government of India to control air pollution include _____.

a)

compulsory PUC (pollution Under Control) certification of petrol-driven vehicles which tests for carbon monoxide and hydrocarbons.

b)

permission to use only pure diesel with a maximum of 500 ppm sulphur as fuel for vehicles.

c)

use of non-polluting Compressed Natural Gas (CNG) only as fuel by all buses and trucks.

d)

compulsory mixing of 20% ethyl alcohol with petrol and 20% biodiesel with diesel.

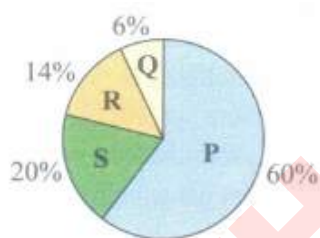
140. Which particulate size is most harmful?

a) 1.0 f.Lm or less b) 1.5 f.Lm or less c) 2.5 f.Lm or less d) 5.2 f.Lm - 2.5 f.Lm

141. Blue-baby syndrome is due to the

a) As b) NO_3 c) Cd d) Hg

142. Given pie-diagram represents the relative contribution of various greenhouse gases to total global warming. Identify the gases P, Q, R and S.



a)

P	Q	R	S
N_2O	CFCs	CO_2	Methane

b)

P	Q	R	S
N_2O	Methane	CFCs	CO_2

c)

P	Q	R	S
CO_2	N_2O	CFCs	Methane

d)

P	Q	R	S
CO_2	CFCs	N_2O	Methane

143. Study the following statements regarding acid rain and select the incorrect ones.

(i) Acid rain refers to the rainfall and other forms of precipitation with a pH of less than 5.

(ii) Oxides of sulphur and nitrogen are released from automobile exhausts, industries, power plants, etc.

(iii) These oxides of sulphur and nitrogen, may react with water in the air and form sulphuric acid (H_2SO_4) and nitric acid (HNO_3).

(iv) Acid rain has harmful effects on animals and human beings but no characteristic impact on plants.

a) (i) and (iii) b) (iii) and (iv) c) (iv) only d) (ii) only

144. A scrubber in the exhaust of a chemical industrial plant removes _____.

- a) gases like sulphur dioxide.
- b) particulate matter of the size 5 micrometer or above.
- c) gases like ozone and methane.
- d) particulate matter of the size 2.5 micrometer or less

145. The Taj Mahal is threatened due to the effect of ____.

- a) oxygen b) hydrogen c) chlorine d) sulphur dioxide

146. Polyblend is

- a) a mixture of two different types of plastics
- b) a fine powder of recycled modified plastic c) a blend of plastic and bitumen
- d) none of these.

147. Which of the following is a method used to get rid of particulate matter present in the exhaust from a thermal power plant?

- a) Magnetic precipitator b) Chromatography c) Electrostatic precipitator
- d) Mass spectrometry

148. National Forest Policy of India has recommended (i) forest cover for the plains and (ii) for the hills.

a)		b)		c)		d)	
(i)	(ii)	(i)	(ii)	(i)	(ii)	(i)	(ii)
33%	67%	67%	33%	50%	50%	40%	60%

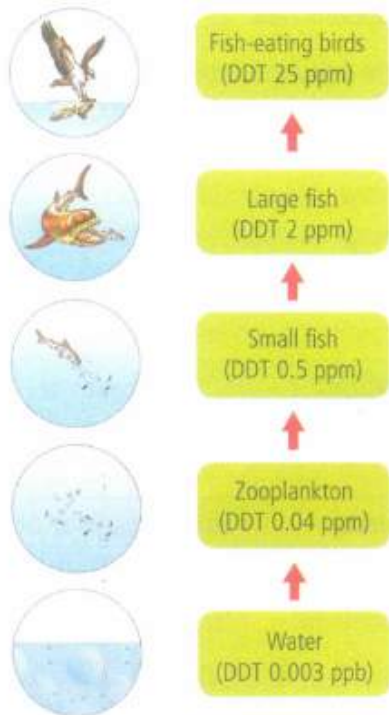
149. Nuisance growth of aquatic plants and bloom-forming algae in natural waters is generally due to high concentrations of

- a) carbon b) sulphur c) calcium d) phosphorus

150. In the textbook you came across Three Mile Island and Chernobyl disasters associated with accidental leakage of radioactive wastes. In India we had Bhopal gas tragedy. It is associated with which of the following?

- a) CO₂ b) Methyl Isocyanate c) CFC's d) Methyicyanate

151. Given figure represents biomagnification of DDT in an aquatic food chain. Select the incorrect statement regarding this.



- a)
When agricultural fields are sprayed with DDT, it is carried by runoff water into nearby aquatic bodies.
- b)
River water may have a very low concentration of DDT, but the omnivorous fish in that river may contain high concentration of DDT, which is still suitable for consumption by human beings.
- c)
Increased concentration of DDT in birds affects calcium metabolism due to which egg shells become thin and break before maturity.
- d) None of these
152. Which of the following is the most suitable indicator of SO_2 pollution in the environment?
a) Lichens b) Conifer c) Algae d) Fungi
153. Contamination of water with sewage is indicated by cysts of
a) Escherichia b) Entamoeba c) Pseudomonas d) Leishmania
154. Increase in concentration of the toxicant at successive trophic levels is known as:
a) Biogeochemical cycling b) Biomagnification c) Biodeterioration
d) Biotransformation
155. Amrita Devi Bishnoi Wildlife Protection Award is for the individuals or communities from rural areas that have shown extraordinary courage in
a) reducing environmental pollution b) reducing global warming
c) protecting wildlife d) reforestation in deforested area.

156. Greenhouse effect is due to
a) accumulation of O_3 and depletion of CO_2 b) accumulation of both O_3 and CO_2
c) accumulation of CO_2 and depletion of O_3
d) presence of green plants on the Earth.
157. The term 'terror of Bengal' is used for
a) algal bloom b) *Eichhornia crassipes*
c) increased biochemical oxygen demand d) eutrophication.
158. Montreal Protocol is associated with
a) control of emission of ozone depleting substances
b) control of radioactive wastes c) control of desertification
d) protection and management of forests.
159. The CO_2 content by volume, in the atmospheric air is about _____.
a) 0.0314% b) 0.34% c) 3.34% d) 4%
160. World ozone day is celebrated on
a) 16th September b) 21st April c) 5th June d) 22nd April
161. Which is not a control measure to reduce particulate matter in environment?
a) Cyclonic separators b) Scrubbers c) Effluent treatment
d) Electrostatic precipitator
162. Assertion: Through the use of catalytic converters, unburnt hydrocarbons are changed into carbon monoxide which in turn is changed into nitrogen oxides and water.
Reason: Motor vehicles equipped with catalytic converters should use leaded petrol to protect the catalyst from degradation.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.
163. Montreal protocol aims at _____.
a) biodiversity conservation. b) control of water pollution.
c) control of CO_2 emission. d) reduction of ozone depleting substances.
164. Chemicals responsible for the Bhopal gas tragedy were
a) CO_2 and CH_4 b) phosgene and methyl isocyanate
c) polychlorinated biphenyls d) dichloro diphenyl trichloroethane.

165. Volcanic eruptions let out large quantities of
a) H_2O vapours and sulphurous gases b) Harmful dust and nitrous gases
c) Harmful dust and shoot d) Harmful dust and phosphorous gases
166. Phosphate pollution is mainly caused by _____.
a) phosphate rock only b) agricultural fertilizers only
c) sewage and phosphate rocks d) sewage and agricultural fertilizers
167. The loudness of a sound that a person can withstand without discomfort is about
a) 150 db b) 215 db c) 30 db d) 80 db.
168. Escherichia coli is used as an indicator organism to determine pollution of water with _____.
a) pollen of aquatic plants b) heavy metals c) fecal matter
d) industrial effluents
169. Size of particulate matter which can cause maximum damage to human health is
a) $25\text{ }\mu\text{m}$ b) $20\text{ }\mu\text{m}$ c) $2.5\text{ }\mu\text{m}$ d) $5\text{ }\mu\text{m}$
170. Biochemical oxygen demand may not be good index for water bodies receiving effluents:
a) Sugar industry b) Domestic sewage c) Dairy industry d) Petroleum industry
171. Which of the following statements is not correct regarding jhum cultivation?
a) It is also called as shifting cultivation and has resulted in deforestation.
b) It helps in increasing crop yield to a considerable extent
c)
A time-gap of several years is required for the recovery of the land after cultivation
d)
It involves cutting down of trees of the forest, burning of the plant remains and then using the land for farming.
172. Montreal protocol was signed in 1987 for control of _____.
a) Release of Green House Gases b) Disposal of e-wastes
c) Transport of Genetically modified organisms from one country to another
d) Emission of ozone-depleting substances
173. Which of the following is not a cause of natural pollution?
a) Volcanic eruption b) UV radiation c) Forest fire d) Mercury
174. Read the following statements carefully.
(i) An electrostatic precipitator removes particulate matter by imposing negative charge on them.
(ii) Catalytic converters convert unburnt hydrocarbons into CO_2 and water.

(iii) Peroxyacyl nitrates (PAN) is a secondary pollutant.

(iv) DDT is a non-biodegradable pollutant.

Which of the above statements are incorrect?

a) (i) and (ii) b) (iii) and (iv) c) (i) and (iii) d) None of these

175. Read the following statements regarding the PAN (Peroxyacyl nitrates) and select the correct ones.

(i) It is a secondary pollutant present in photochemical smog.

(ii) It is produced by photochemical reactions between hydrocarbons and nitrogen oxides in the presence of sunlight or UV radiations.

(iii) It is thermally unstable and decomposes into peroxyethanoyl radicals and nitrogen dioxide gas.

(iv) It is a lachrymatory substance, causing irritation of eyes.

a) (i) and (ii) b) (iii) and (iv) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)

176. The concentration of polychlorinated biphenyls (PCB, an organochloride contaminant) in many fish populations has been declining, since a ban on their production was instituted in the late 1970s. PCBs remain a potential problem, however, because they are lipophilic and are known to biomagnify. Based on this knowledge, what type of fish is expected to be safest for human consumption?

a) Fish species with high fat content

b) Piscivorous fish species (i.e., which eat other fish)

c) Benthivorous fish species (i.e., which eat invertebrates on the lake bottom)

d) Small (young) fish

177. Catalytic converters, which are fitted into automobiles for reducing the emission of poisonous gases possess which of the following metals as catalyst?

a) Platinum-Palladium b) Rhodium c) Lead d) Both (a) and (b)

178. Ozone layer of upper atmosphere is being destroyed by

a) chlorofluorocarbons b) SO_2 c) O_2 and CO_2 d) smog

179. A major component of gobar gas is _____.

a) ammonia b) methane c) ethane d) butane

180. Read the following statements and select the correct option.

Statement 1 : Ozone layer present in the stratosphere protects the living organisms from harmful UV rays coming from sun by absorbing nearly all of them.

Statement 2 : Ozone formed in the troposphere by photochemical reactions as a result of human activities is harmful for all living organisms.

a) Both statements 1 and 2 are correct.

b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect.

181. In 1984, Bhopal gas tragedy was caused due to the leakage of _____.

- a) potassium isocyanate b) sodium monoxide c) sodium thiocyanate
d) methyl isocyanate

182. Match the items in column I and column II and choose the correct option.

Column - I	Column - II
A UV	i Biomagnification
B Biodegradable organic matter	ii Eutrophication
C DDT	iii Snow blindness
D Phosphates	iv BOD

- a) A-(ii), B-(i), C(iv), D-(iii) b) A-(iii), B-(ii), C-(iv), D-(i) c) A-(iii), B-(iv), C-(i), D-(ii)
d) A-(iii), B-(i), C-(iv), D-(ii).

183. Which one of the following statements regarding CO gas is correct?

- a) It is produced by the complete combustion of fossil fuels.
b) It combines with haemoglobin to form carbamino haemoglobin.
c)
It impairs oxygen transport resulting in giddiness, headache, asphyxia and even death.
d) All of these

184. Assertion: Photochemical smog is mainly composed of nitrogen oxides, volatile organic compounds, ozone and peroxyacyl nitrates.

Reason: Photochemical smog develops in cold weather conditions by the interaction of secondary pollutants.

- a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

185. In which one of the following the BOD (Biochemical Oxygen Demand) of sewage (s), distillery effluent (DE), paper mill effluent (PE) and sugar mill effluent (SE) have been arranged in ascending order?

- a) SE b) PE c) S d) SE

186. Sound becomes hazardous noise pollution at level _____.

- a) above 30 dB b) above 80 dB c) above 100 dB d) above 120 dB

187. High concentration of nutrients especially nitrates and phosphates in water can accelerate which of the following phenomenon?
a) Algal bloom b) Eutrophication c) Biomagnification d) Both (a) and (b)
188. Which is not a natural source of CH_4 in environment?
a) Biomass burning b) Termites c) Gut of ruminants d) Rice fields
189. The material generally used for sound proofing of rooms like a recording studio and auditorium, etc. is
a) cotton b) coir c) wood d) styrofoam
190. Which of the following statements is not correct regarding algal blooms?
a) Algal blooms are formed by blue-green algae.
b) Growth of *Eichhornia crassipes* causes colouration.
c) Increased growth of algae causes depletion of O_2 in water.
d) Algal blooms cause deterioration of water quality and fish mortality.
191. Assertion: An equilibrium is established between generation and destruction of ozone, leading to a steady state concentration of ozone layer in the stratosphere at an altitude of 20-30 km above sea level.
Reason: The thickness of the ozone layer is generally larger above the equator and smaller above the poles.
a)
If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false
192. DDT is _____.
a) a non-degradable pollutant b) an antibiotic c) a biodegradable pollutant
d) not a pollutant
193. Wastes may be sealed in concrete-filled drums and discharged to a depth of about 500 m. This specific statement is true for
a) γ -radiation pollutants b) UV radiation pollutants c) β -particle pollutants
d) All radioactive pollutants
194. Acid rain
(a) Causes necrosis
(b) Convert chlorophyll-a into pheophytin
(c) Responsible for formation of PAN

- a) Only (a) and (b) are correct b) Only (b) and (c) are correct
c) Only (a) is correct d) Only (c) is correct

195. Read the following statements carefully and select the incorrect ones.

- (i) Development of the fertile top-soil takes centuries, but it can be easily removed due to human activities such as over-cultivation, unrestricted grazing, etc.
(ii) Waterlogging results in soil salinity.
(iii) UV rays are responsible for degradation of ozone shield in atmosphere.
(iv) Ozone present in troposphere acts as a shield absorbing UV radiations coming from the Sun.
(v) Global warming can be controlled by increasing the use of fossil fuels.
a) (i), (iii) and (v) b) (iii), (iv) and (v) c) (iv) and (v) d) (i), (ii) and (iii)

196. The Air Prevention and Control of Pollution Act came into force in

- a) 1957 b) 1981 c) 1985 d) 1990

197. Major aerosol pollutant in jet plane emission is _____.

- a) sulphur dioxide b) carbon monoxide c) methane d) chlorofluorocarbons

198. Accelerated eutrophication occurs due to

- a) increase in amount of dissolved oxygen
b) disposal of waste rich in nitrates and phosphates
c) increase in concentration of DDT and mercury in water
d) unsafe disposal of radioactive wastes.

199. Assertion: An electrostatic precipitator (ESP) is a particulate collection device that removes dust and smoke particles from flowing air using the force of an induced electrostatic charge.

Reason: An ESP is a highly efficient device as it removes 99 percent of particulate matter present in the exhaust from a thermal power plant.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

200. The green scum seen in the freshwater bodies is:

- a) blue green algae b) red algae c) green algae d) both (a) and (c)

201. Joint Forest Management concept was introduced in India during:

- a) 1960s b) 1970 c) 1980s d) 1990

202. Kyoto Protocol was endorsed at _____.

- a) Cop-5 b) Cop-6 c) Cop-4 d) Cop-3
203. The zone of atmosphere in which ozone layer is present is.
a) Troposphere b) Stratosphere c) Mesosphere d) Ionosphere
204. Montreal protocol which calls for appropriate action to protect the ozone layer from human activities was passed in the year _____.
a) 1987 b) 1988 c) 1985 d) 1986
205. What of the following is a secondary pollutant?
a) SO_2 b) CO_2 c) CO d) O_3
206. Disease caused by eating fish found in water contaminated with industrial waste having mercury is _____.
a) Minamata disease b) Bright's disease c) Hashimoto's disease
d) Osteosclerosis
207. The Chipko movement was launched for protection of:
a) Forests b) Grasslands c) Wetlands d) Livestock
208. Assertion: Sewage, industrial effluents and waste water are non-point sources of water pollution.
Reason: Surface runoff is point source of water pollution.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
209. Fluoride pollution initially affects:
a) kidneys b) teeth c) heart d) brain
210. Which one of the following is mismatched?
a) Fossil fuel burning - Release of CO_2 b) Nuclear power - Radioactive wastes
c) Solar energy - Greenhouse effect d) Biomass burning - Release of CO_2
211. Which of the following is correct regarding 'El Nino' Effect?
a) Temperature rise leads to odd climatic changes
b) Cutting down the use of fossil fuels c) Planting more trees
d) Slowing down the growth of human population
212. Which of the following conference obtained commitments from different countries for reducing overall green house gas emission at a level 5% below 1990 level by 2008-2012?

- a) Kyoto Protocol, 1997 b) Earth Summit, Rio-de-Janeiro, 1992
 c) Montreal Protocol, 1987 d) Helsinki Declaration, 1989

213. Assertion: Compressed natural gas (CNG) is natural gas under pressure and mainly composed of methane.

Reason: One of the advantages of using CNG as a fuel in automobiles is that it requires very less space for storage as compared to that of petrol or diesel.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false.

214. Polyblend, a fine powder of recycled modified plastic' has proved to be a good material for ____.

- a) use as a fertilizer b) construction of roads c) making tubes and pipes
 d) making plastic sacks

215. In 1984, Bhopal gas tragedy took place because methyl isocyanate ____.

- a) reacted with DDT b) reacted with ammonia c) reacted with CO₂
 d) reacted with water

216. Given below are some differences between primary air pollutants and secondary air pollutants. Which one of the following is an incorrect difference?

a)

Primary air pollutants	Secondary air pollutants
These persist in the form in which they are added to the environment.	These are formed by interaction among the primary pollutants

b)

Primary air pollutants	Secondary air pollutants
These are more toxic than the secondary pollutants.	These are less toxic than the primary pollutants.

c)

d) None of these

Primary air pollutants	Secondary air pollutants
Examples include DDT, CO ₂	Examples Ozone, PAN

217. Select the correct match of air pollution source with the type of pollutant and the effect it produces.

- a) Chemical factory → NO₂ → Ozone hole
 b) Automobile exhaust → N₂O → Asphyxia effect

- c) Heavy industry \rightarrow CO_2 \rightarrow Acid rain
d) Incinerators \rightarrow NO_x gases \rightarrow Photochemical smog
218. Which of the following protocols did aim for reducing of chloro-fluoro-carbons into the atmosphere?
a) Kyoto Protocol b) Gothenburg Protocol c) Geneva Protocol
d) Montreal Protocol
219. Which one of the following statements is incorrect regarding Bhopal gas tragedy?
a) Methyl isocyanate gas leakage took place.
b) Thousands of human beings died. c) Radioactive fallout engulfed Bhopal.
d) It took place in the night of December 2/3, 1984.
220. The Government of India has passed the environment (Protection) Act in the year
a) 1990 b) 1987 c) 1986 d) 1992
221. A higher biochemical oxygen demand in a particular segment of a river indicates that
a) the segment is free from pollution b) the segment is highly polluted
c) aquatic life has started flourishing
d) the river has high number of aquatic animals.
222. Which of the following materials takes the longest time for biodegradation?
a) Cotton b) Paper c) Bone d) jute
223. Acid rain is caused by increase in the atmospheric concentration of _____.
a) SO_3 and CO b) CO_2 and CO c) O_3 and dust d) SO_2 and NO_2
224. Read the given statements and select the correct option.
Statement 1 : Average temperature of Earth has increased by 0.6°C during the past century.
Statement 2 : There has been a progressive increase in the use of fossil fuels generating more greenhouse gases.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.
225. Noise pollution may cause nervousness and irritability by stimulating the secretion of
a) thyroid hormone b) adrenal hormone c) parathyroid hormone
d) none of these.
226. Select the correct statement out of the following.

a)

Electrostatic precipitators (ESPs) can remove over 99% particulate matter present in the exhaust from a thermal power plant.

b)

Over half of the e-wastes generated in developed countries are exported to developing countries, mainly to China, India and Pakistan, where metals like Cu, Fe, Si, Ni, etc., are recovered during recycling process.

c)

Use of nuclear energy has two very serious inherent problems first is accidental leakage and the second is safe disposal of radioactive wastes.

d) All of these

227. Catalytic converters are fitted into automobiles to reduce emission of harmful gases.

Catalytic converters change unburnt hydrocarbons into:

- a) carbon dioxide and water b) carbon monoxide c) methane
d) carbon dioxide and methane.

228. A renewable exhaustible natural resource is _____.

- a) coal b) petroleum c) minerals d) forest

229. Given below are four statements each with two blanks. Select the option which correctly fills up the blank in any two statements.

(i) Bhopal gas disaster took place on _____ 1984 and this day is now observed as the _____ day in India to make the anniversary of the Bhopal gas disaster.

(ii) _____ is a biodegradable pollutant while _____ is a non-biodegradable pollutant.

(iii) When pollutants are released from a single point it is called _____ pollution, but when it is over a large area, then it is called _____ pollution.

(iv) _____ is the world's most problematic aquatic weed, introduced in India for its lovely flowers, also called as _____.

- a) (i) December 5, National pollution prevention (iv) Parthenium, terror of Bengal
b) (i) December 2, Bhopal gas tragedy (ii) DDT, sewage
c) (ii) Sewage, DDT (iii) point source, non-point source
d) (iii) line source, fixed source (iv) Eichhornia, tiger of Bengal

230. Which of the following is the most dangerous metal pollutant of automobile exhaust?

- a) Cadmium b) Copper c) Mercury d) Lead

231. Ultraviolet radiations from sunlight cause a reaction which produces _____.

- a) O_3 b) SO_2 c) CO d) CH_4

232. Which one is the correct percentage of greenhouse gases?

- a) Methane - 20%, N_2O - 18% b) CFCs-14%, Methane - 20%
c) CO_2 - 40%, CFCs- 30% d) N_2O - 6%, CO_2 -86%

233. Match column I with column II and select the correct option from the given codes

	Column - I		Column - II
A	Nitrates	i	Primary pollutant
B	E-Wastes	ii	Minamata disease
C	Mercury	iii	Secondary pollutant
D	DDT	iv	Blue-baby syndrome
E	PAN	v	Electronic wastes

- a) A-(ii), B-(iv), C-(v), D-(i), E-(iii) b) A-(iv), B-(v), C-(ii), D-(i), E-(iii)
 c) A-(iv), B-(v), C-(iii), D-(ii), E-(i) d) A-(ii), B-(v), C-(iv), D-(i), E-(iii)

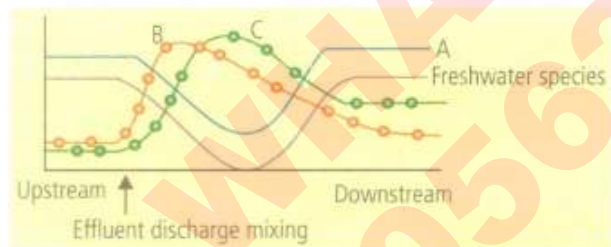
234. Global warming can be controlled by _____.

- a) Reducing reforestation, increasing the use of fossil fuel.
 b) Increasing deforestation, slowing down the growth of human population.
 c) Increasing deforestation, reducing efficiency of energy usage.
 d) Reducing deforestation, cutting down use of fossil fuel.

235. Domestic waste constitutes _____.

- a) non-biodegradable pollution b) biodegradable pollution c) effluents
 d) air pollution

236. The graph given below represents changes in different ecological parameters due to effluent mixing in a stream. The three lines A, B and C represent



A: oxygen concentration

A: pollutant

B: biological O₂ demand

B: aerobic process

- a) C: pollution resistant species b) C: anaerobic process

A: oxygen concentration

A: phosphate concentration

B: CO₂ concentration

B: nitrate concentration

- c) C: temperature

- d) C: rate of photosynthesis.

237. Bone cancer is caused by

- a) Iodine -127 b) Strontium - 90 c) Caesium - 137 d) Phosphorous - 32

238. Read the following statements regarding particulate matter and select the incorrect ones.

- (i) Particulate matter (PM) consists of shoot, flyash, dust, spores, pollen grains, etc.
 (ii) Particulate matter is differentiated into settleable (larger than 10 urn. remaining in air for less than one day) and suspended (less than 10 urn remaining in air for more than one day to several weeks) particulate matter.

(iii) SPM (Suspended particulate matter) consists of aerosol, dust and mist.

(iv) Particulate matter causes respiratory diseases such as tuberculosis, allergy and many more diseases in animals and plants.

(v) According to Central Pollution Control Board (CPCB), particulate size of 2.5 μm or less in diameter are responsible for causing the greatest harm to human health.

a) (i) and (ii) b) (iii) and (iv) c) (ii) only d) None of these

239. Eutrophication of water bodies leading to killing of fishes is mainly due to non-availability of ____.

a) light b) essential minerals c) oxygen d) food

240. Which one is wrong statement?

a) Ozone in the upper part of atmosphere is harmful to animals

b) Greenhouse effect is a natural phenomenon

c) Eutrophication is a natural phenomenon in freshwater bodies

d) Most of the forests have been lost in the tropical area

241. The following table summarises the differences between biodegradable and non-biodegradable pollutants. Pick out the wrong differences and select the correct answer.

	Biodegradable pollutants	Non-biodegradable pollutants
(i)	These are the pollutants which can be easily degraded by micro-organisms.	These are the pollutants which can not be degraded into harmless materials.
(ii)	These can be used to produce energy (through biogas), compost, manure, etc	These are difficult to manage as natural method of degradation is absent.
(iii)	These usually do not enter biogeochemical cycles.	These become a part These become a part biogeochemical cycles.
(iv)	Examples: DDT, BHC, plastics, polyethylene, glass, etc.	Examples: Sewage, garbage, animal waste, etc.

a) (i) and (iv) b) (ii) and (iv) c) (iii) and (iv) d) (ii), (iii) and (iv)

242. With its very large population of vehicular traffic, Delhi is one of the most polluted cities of the world. Which of the following steps were taken by the government to reduce vehicular pollution in Delhi?

(i) Switching over the entire fleet of public transport ie., buses, autorickshaws, from diesel to CNG

(ii) Phasing out of old vehicles

(iii) Use of unleaded petrol in vehicles

(iv) Use of low sulphur petrol and diesel in vehicles

(v) Use of catalytic converters in vehicles

(vi) Application of stringent pollution level norms for vehicles such as Euro - II norms, etc.

a) (ii) and (iv) b) (ii), (iv) and (v) c) (iv) and (v) d) All of these

243. Assertion: Heavy metals and persistent pesticides pass into the food chain and increase in amount per unit weight of the organism at successive trophic levels.

Reason: Heavy metals and persistent pesticides can be easily metabolised by the organism's body.

a)

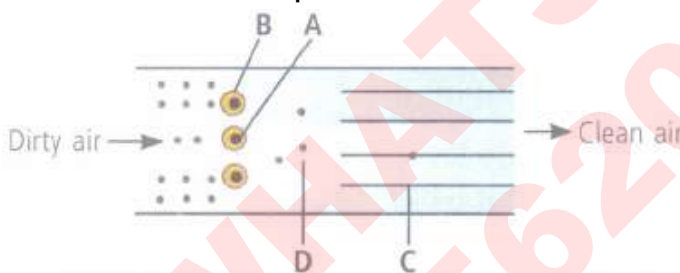
If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

244. Given below is a diagram of electrostatic precipitator. Identify A, B, C and D and select the correct option.



a)

A	B	C	D
Negatively charged wire	Negatively charged dust particles	Discharge corona	Collection plate

b)

A	B	C	D
Negatively charged wire	Discharge corona	Collection plate	Negatively charged dust particles

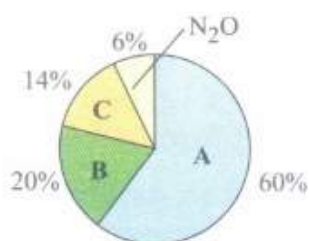
c)

A	B	C	D
Positively charged wire	Positively charged dust particles	Discharge corona	Collection plate

d)

A	B	C	D
Positively charged wire	Discharge corona	Collection plate	Positively charged dust particles

245. Which one of the following pairs is mismatched.
- a) Fossil fuel - burning release of CO_2 b) Nuclear power - radioactive wastes
c) Solar energy - greenhouse effect d) Biomass burning - release of CO_2
246. Euro-II (April - 2000) is emission norms for reducing
- a) O_3 and CO b) NO_2 and N_2O c) Sulphur and Aromatic hydrocarbons
d) CO_2 and particulate matter
247. The products resulting from atmospheric reactions of hydrocarbons and nitrogen oxides in the presence of sunlight are called
- a) Primary pollutant b) Secondary pollutant c) Tertiary pollutant
d) Non-pollutant
248. Given pie-diagram represents the relative contribution of various GHGs to total global warming. Select the correct statement(s) regarding A, B and C.



- a) A is the gas which is produced during the combustion of fossil fuels.
b) B are the chemicals which are used as coolants in refrigerators.
c) C is the gas which is the major constituent of biogas. d) All of these.
249. Biochemical Oxygen Demand (BOD) in a river water _____.
a) has no relationship with concentration of oxygen in the water.
b) gives a measure of Salmonella in the water.
c) increases when sewage gets mixed with river water.
d) remains unchanged when algal bloom occurs.
250. Atmosphere of big metropolitan cities is polluted most by _____.
a) automobile exhausts b) pesticide residue c) household waste
d) radioactive fall-out
251. Which is not an effect of global warming?
a) More extreme weather condition b) Poleward shifting of organism
c) Rise of sea level d) Good fungal growth in soil
252. Increasing skin cancer and high mutation rate are the result of:
a) ozone depletion b) acid rain c) CO pollution d) CO_2 pollution
253. According to Central Pollution Control Board (CPCB). Which particulate size in diameter (in micrometers) of the air pollutants is responsible for greatest harm to human health:
a) 2.5 or less b) 1.5 or less c) 1.0 or less d) 5.2 - 2.5

254. Select the correct match.
- a) Integrated farming: Ramesh Chandra Dagar
 - b) Integrated waste water treatment: Ahmed Khan
 - c) Solid waste management: Ramesh Chandra Dagar
 - d) E-waste management: Chandi Prasad Bhatt
255. According to the Central Pollution Control Board, particles that are responsible for causing great harm to human health are of diameter
- a) 2.50 micrometers b) 5.00 micrometers c) 10.00 micrometers
 - d) 7.5 micrometers
256. The worst environmental hazards were created by accidents in nuclear power plant and MIC gas tragedy respectively in _____.
- a) Russia in 1990 and Bhopal in 1986 b) Ukrainian 1988 and USA in 1984
 - c) Bhopal in 1984 and Russia in 1990 d) Ukrainian 1986 and Bhopal in 1984
257. World's most problematic aquatic weed is:
- a) Azalia b) Walffia c) Eichharnia d) Trapa
258. Select the correct statement regarding integrated organic farming.
- a)
It is a cyclical, zero waste procedure where waste products from one process are cycled in as nutrients for other processes.
 - b)
In this process, industrial wastes is used to manufacture product such as polyblend
 - c) In this process, chemical fertilisers are used to increase yield
 - d) both (a) and (c)
259. Which of the following statements regarding ozone is incorrect?
- a)
'Good ozone' is formed in the lower atmosphere (troposphere) that absorbs harmful UV rays coming from Sun; 'bad ozone' is present in the upper part of atmosphere (stratosphere) that harms plants and animals.
 - b)
The thickness of the ozone in a column of air from the ground to the top of the atmosphere is measured in terms of Dobson units (DU).
 - c)
Recognising the deleterious effects of ozone depletion, an international treaty, known as the Montreal Protocol, was signed at Montreal (Canada) in 1987 (became effective in 1989) to control the emission of ozone depleting substances.
 - d) None of these
260. The smog which is formed at high temperature is

- a) London smog b) Classical smog c) Los Angeles smog d) Sulphurous smog
261. Highest DDT deposition shall occur in _____.
a) phytoplankton b) sea gull/birds c) crab d) eel
262. Carbon monoxide is a pollutant because _____.
a) reacts with O_2 b) it inhibits glycolysis c) it reacts with hemoglobin
d) it makes nervous system inactive
263. If there is no greenhouse effect, then the average temperature at surface of earth would have been:
a) $15^{\circ}C$ b) $-18^{\circ}C$ c) $-6^{\circ}C$ d) $10^{\circ}C$
264. Painful skeletal deformities called itai-itai is caused due to
a) Cd b) Hg c) CO d) NO_2
265. Which one of the following statements is not valid for aerosols?
a) They alter rainfall and monsoon patterns.
b) They cause increased agricultural productivity.
c) They have negative impact on agricultural land.
d) They are harmful to human health