SECTION –A TOPIC WISE QUESTIONS

TOPIC-1: mendel's law inheritance

1.Read thae following statements and find out the incorrect statement/

a) Genctics deals with the inheritance as well as variation of characters from parents to offspring.
b) Variation is the process by which characters are passed of from parent to progeny
c) Inheritance is the basis of heredity
d) Inheritance is the degree by which progeny fro their parents
e) Human knew from as early as 8000-1000B.C. that one of the causes of variation was hidden in sexual reproduction

(A) b, d and e (B) a, c and e

(C) ba nd d only (D) e only

2. gregor mendel conducted hybridization experiments

(A) Seven years (1865-1872)
(B) Seven years (1856-1863)
(C) Seven years (1853-1860)
(D) Fourteen years(1853-2860)

3. sahiwal cow in …a… was developed by… b…

(A) a—— Punjab, b —— natural selection and domestrication
(B) a —— Haryana, b—— natural selection and artificial selection
(C) a ——Haryana, b ——artificial selection and domestication
(D) a ——Punjab, b—— artificial selection and domestication

4. occasionally, a single gene may express more than one effect. This is

(A) polygenec ingeritance (B) plciotropy

(C) multiple allelism (D) co-diminance

5. read the following statements regarding mendelian in heritance and choose the correct option

(A) Mendel's experiments had small sample size which gave greater credibility to the data

(B) A true breeding line shows a stable trait inheritance and expression for several generations

(C) In a dissimilar pair of factors, one member of the pair dominates over the other.

(D) A recessive parental trait is expressed only in its heterozygous condition'

Two allelws of a gene are located on homologous sites of homolohous chromosomes

(A) 2 alone is correct
(B) 2,3 and 5 are correct
(C) 1 and 4 are correct
(D) 1,3 and 5 are correct

6. Mendel conducted hybridisaion experiments of garden pea for

(A) 4 years (B) 5 years

(C) 6 years (D) 7 years

7. Which of the following is not a correct dominant –recissive trait pairs of *pisum saivum?*

(A) Axial – terminal flower position. Tall- dwarf stem height
(B) Yellow-green pod colour. Round – wrinkled seed shape
(C) Full – constricted pod shape, yellow –green seed colour
(D) Violet- white flower colour, inflated – constricted pod shape

8. Biological unit controlling heredity is

(A) genome (B) chromosome
(C) genotype (D) gene

9. Vanations found in offspring are important component of

(A) genetics (B) speciation
(C) species fization (D) heredity

10.Test cross is a cross between

(A) Hybrid> dominant parent (Tt>TT)
(B) Hybrid > recessive parent(Tt >tt)
(C) Hybrid > hybrid (Tt>Tt)
(D) All the above

11. The term genetics was proposed by

(A) johnnsen (B) morgan
(C) mendel (D) bateson

12. A gamete normally contains

(A) Many alletes of a gene
(B)All alleles of a gene
(C)Two alleles of a gene
(D)One allele of a gene

13.. Branch of biology dealing with heredity and variation is

(A) ecology (B) evolution
(C) paleontology (D) genetics

14.. Phenotype of an organism is the result of

(A)Mulations and linkages
(B)Genotype and environment interactions
(C)Cytoplasmic effects and nutirition
(D)Environmental changes and sexual dimorphism

15.. Word genetics comes from

(A) gene (B) genesis

(C) genome (D) genomics

16.. Genes controlling seven treaits pea studied by mendel were actually located on

(A) Seven chromosomes (B) six chromosomes

(C) four chromosomes (D) five chromosomes

17 . pea wrinkling of seeds is due to non-formation of starch because of the absence of encyme

(A) amylase (B) invertase

(C) branching enzyme (D) diastase

18. Father of human genetics is

(A)curvierf (B) bateson

(C) mendel (D) garrod

19.Which is wrong about mendel?

(A) He was born in 1822

(B) Mendel carried out his experiments of 7 years

(C) Mendel died in 1884

20.For a given character, a gamete is always

(A) homozygous (B) pure

© hybrid (D) heterozygous

21. Gregor johann mendel, the father of agenetics was

(A) Austrain monk (B) british monk

(C) Italian monk (D) german scientist

Topic :2

Law of dominance, law of segregation, incomplete dominance and co-dominance

22.Genes which code for a pair of contrasting traits are known as

(A) Cistron (B) allele

(C) exon (D) intron

23. Alleles are

(A) Similar forms of different gene
(B) Slightly different forms of the different gene
(C) Similar forms of the same gene
(D) Slightly different forms of the same gene

24. In punnett square, the possible gametes are written of two sides, usually the

(A) Top row and left columns
(B)Top row and right columns
(C)Bottom row and right columns
(D)Bottom row and left columns

25. Punnett square was developed by

(A)British zoologist, Reginald C. punnett
(B)German botanist, Reginald C. punnett

(C) Stanford geneticist Reginald C. punnett
(D) British gent\eticish reginald C. punnett

26. Select one word for the statement.

Dominance, co- dominance, incomplete dominance

a) IfF1resembled both the parents
   a. IfF1 did not resembled either of the two parents and was in bête\ween the two
   b. IfF1 resembled either of the two parents

(A) C – dominance, b-Co – dominance,a-incomplete dominance,
(B) a– dominance, c -Co – dominance,b-incomplete dominance,
(C) b- dominance, a–co- dominance,c- incomplete dominance
(D) C – dominance, a–co- dominance, b-incomplete dominance,

27. When a violet flower of unknown henotype is crossed with white flower, the progenies are violet and white in equal proportion. Then read the following statements.

i. This is called test cross
ii. Unknown flower is homozygous
iii. Unknown flower is heterozygous
iv. This test is used to determine the phenotype of the plant at f_2–
v. In test cross, violet or white flower is crossed with the recessive parent instead of self-crossing

Select the incorrect statement:

(A) Iii,iv, v (B) ii, iv

(C) i , ii , v (D) ii, iv, v

28. "both the characters in a monohybrid cross are recovered as such in the f_2 generation though one of these in not seen at the f_1 stage ". This interpretation is based of the

(A) First law of mendel
(B) Second law of mendel
(C) Second set of generalizations
(D) Incomplete dominance

29. In case of *antirrhinum* sp. The recessive trait is seen in progenies due to the

i. The normal enzyme
ii. Less-efficient enzyme
iii. Non-functional enzyme
iv. No enzyme at all

Select the correct option among i-iv:

(A)Ii, iii (B) iii, iv

(C) i , iii (D) I, ii

30.The proportion of 3:1 at the f_2 generation is explained by the

(A)Law of dominance
(B)Law of segregation
(C)Law of independent assortment
(D)Test cross

31. In mendelian dihybrid cross how many are recombinants?

(A)37.2% (B) 62.8%

(C) 37.5% (D) 62.5%

32.Starch synthesis in the pea seed is controlled by one gene. Th has two alleles B and b. if starch grani size is considered as the phenotype, then from this angle allele show

(A)Multiple allele
(B)Incomplete dominance
(C)Co-dominance
(D)Polygenic inheritance

33. In incomplete dominance, the ration which not deviates from the mendelian monohybrid cross?

(A)Genotypic ratio (B) phenotypic ratio

(C) both (D) either Aor B

34.Which is correct?

(A)Each bank cross is test cross
(B)Each test cross is back cross
(C)Crossing f_2 with f_1 is called test cross
(D)Crossing f_2 with either parent is called test cross

35. A cross between black flowered plant and white flowered plant yielded grey flowered plants. The phenomenon is

(A)Co – dominance
(B)Pseudo-dominance
(C)Incomplete dominance
(D)Epistasis

36.Mendel proposed something was being stably passed down unchanged from parents to offspring called

(A)Genes (B) genotype
(C) gactors (D) alleles

37. /tt mates Tt, what will be characteristic of off spring?

(A)75% recessive (B) 50% recessive
(C) 25% recesseve (D) all dominant

38.Sexually reproducing organisms contribute in their off spring

(A)All of the genes
(B)One half of their genes
(C)One fourth of their genes
(D)Double the number of genes

39.An allele is dominant if it is expressed in

(A)Both homozygous and heterozygous states
(B)Second generation
(C)Heterozygous combination
(D)Homozygous combination

40. A child of O – group has B-group father. The genotype of father will be

(A) ii (B) $I^B I^B$

(c) $I^A I^B$ (d) $I^B\ i$

41. Mendel's of principle of segregation is based on separation of alleles during

(A) Gamete formation
(B) Seed formation
(C) Pollination
(D) Embroyonic development

42.law of dominance – recessiveness in proved by

(A) back cross
(B) incomplete dominance
(C) monohybrid cross
(D) dihybrid cross

43. O group mother with O group child sues AB group for fathership of child. What is true?

(A) the claim is correct
(B) father is true but mother is not'
© both parent are false
(E) Mother is true but father's claim is wrong

44. genes located on same locus but having different expressions are

(A) multiple alleles (B) oncogenes

(C)polygenes (D) co-dominants

45. A cross between hybrid and its parent is

(A) back cross (B) reciprocal cross

(C) monohybrid cross (D) dihybrid cross

46. blood grouping in human beings is controlled by

(A) 4 alleles in which A is dominant

(B) 3 alleles in which A and Bis codominant, are recessive

(C) 3 alleles in which none is dominant'

(D) 3 alleles in which A is dominant

47. sickle cell anaemia is an example of

(B)Epistasis
(C) Codominance
(D)Pleiotropy
(E) Incomplete dominance

48. heterozygous tall plant is selfed. It produces both tall dwarf plants. This confirms mendel's

(A) Law of dominance
(B) Law of segregation
(C) Law of independent assortment
(D) Incomplete dominance

49. which of the following cross determines heterozygous of homozogosity?

(A) Monohybrid cross
(B) Dihybrid cross
(C) Test cross
(D) Back cross

50. the allele which is unable to express its effect

(A) Co-dominant
(B)Supplementary
(C)Complementary
(D)Recessive

51. alleles are

(A) Alternate forms of a gene
(B) Pairs of sex chromosomes
(C) Homolohous chromosomes

(D) None of the above

52. incomplete dominance was discovered by

(A) correns (B) mendel

(C) johannsen (D) bateson

53. A polygenen inheritance in human beings is

(A) skin colour (B) phenylketonuria

(C) colour blindness (D) sickle cell anemia

54. in case of incomplete dominance, f_2 generation has

(A) Genotypic ration equal to phenotypic ratio

(B) Genotypic ration is 3:1

(C) Phenotypic ratio in 3:1

(D) None of the above

55 . Human skin colour is polygenic trait with each dominant determining a part of melanin deposition while the recessive are coding for no melanin. If a very dark skinned person marries a very light skinned womer, the chance of a very dark skinned offspring are

.(A) 0 (B)1/4

(C) 5/8 (D) 9/64

56. how many types of gametes will be produced by individuals of AABbcc genotype?

(A) two (B) four

(C) six (D) none

57. A pure tall Pea plant is crossed with poure dwarf Pea plant. The progeny is self-polinated. The ratio of true breeding tall pea plants of true breeding dwarf pea plants shall be

(A) 2:1 (B) 1:1

(C) 3:1 (D) 1:2

58. the offspring of mating between two pure breeding strains are called

(A) hybrid (B) progeny

(C) cybrid (D) heterosis

59. in heterozygous condition , both the alleles express in

(A) colour blindness (B) AB blood group

(C) Rh factor (D) Aand B blood types

60. when both alleles express their effect of being present together, the phenomenon is called

(A) dominance (B) codominance

(C) pseudodominance (D) amphidominance

61. inheritance of blood group is a comdition of

a) Codominance
b) Incomplete dominance
c) Multiple allelism
d) Dominance

(A) A,b (B) b, d

(C)a,c and d (D) b,c

62. the graphical representation to calculate the probability of all possible genotypes of offspring in a genetic cross is called

(A) Pedigree analysis
(B) Punnet square
(C) Chromosome map
(D) Genotypic ratio

63. In a polygenic cross Aa Bb Cc * Aa Bb Cc, the phenotypic ratio offspring 1:6 'X':20:X:6:1 what is the value of 'X"?

(A) 3 (B) 7

(C) 15 (D) 25

64. children in a family have blood types O, A, AB and B respectively. What are the genotypes of their parents?

(A) I^A i and I^Bi
(B) I^AI^B and ii
(C) I^B I^B and I^AI^A
(D) I^AI^A and I^Bi

Topic 3 : inheritance of two genes

Law of independent assortment, chromosomal theory of inheritance, linkage oan decombination

65. read the following statements and find out the incorrect statement.

a) Though the genotypic ratios can be calculated using mathematical probability, by simply looking at the phenotype of recessive trait, it is not possible to know the genotypic composition.

b) The ¼: ½ ration of TT : Tt : It is mathematically condensable to form of the binomial expression (ax + by^2) , that has the gametes bearing genes T and t in equal frequency of ½

c) Based on his observation of dihybrid crosses mendel proposed two urles that are called principles or laws of inheritance; the first law law of dominance and the second law or law of segregation.

d) If in test cross, all the progenies shows dominant trait then the unknown parent is heterozygous dominant

e) ABO blood group are controlled by three alleles $I^A I^B$ and i. I^A *and* I^B produce a slightly different type of the sugar

(A_) a,c, and d (B) b , d and e

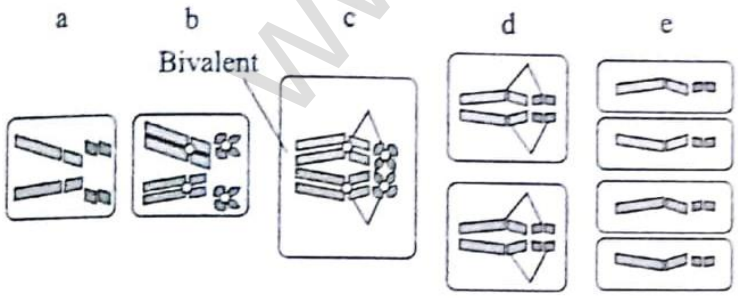
(C) a and c only (D) c and d only]

66. the chromosome movement during meiosis had been worked out by the year

(A) 1865 (B) 1900

(C) 1902 (D) 1891

67. recognize the figure and find out the correct matching.



(A) a - G_1 , b – S , c - - G_2, d – M ,e – germ cells

(B) a - G_1, , b- G_2, c – meiosis Imetaphase, d – meiosis II metaphase, e- germ cells

(C) a - G_1, , b- G_2, c – meiosis prophase, d – meiosis II prophase, C – meiosis II telophase

(E)a - G_1, , b- G_2, c – meiosis anaphase, d – meiosis II anaphase, e- germ cells

68. who argued that the pairing and separation of pair of chromosomes would lead to the segregation of a pair of factors they carried?

(A) Sutton and boveri (B) T,H. morgan
(C) Alfred sturtecant (D) both B and C

69. In the question no…….the srengrh of linkage between y and w is

(A) higher than w and m (B) lower than w and m
(C) same as w and m (D) can't be predicted

70. in mendelian dihybrid cross the yellow and green colour of seed is segregated in the ratio of

(A) 3:1 (B) 10:6
(C) 9:4 (D) 9:7

71. read the following statements.

i. Morgan carried out several monohybrid crosses in *drosophila* to study genes that were sex – linked.
ii. Morgan attributed that proportion of parental gene combination is less than the non-parental type due to the physical association
iii. Term recombination was coined by morgan to describe the generation of non-parental bene combinations
iv. Alfied strutevent used the frequency of linkage between gene pairs of the same chromosome and find genetic map;

Selection how many are incorrect statement

(A) 3 (B) 1
(C) 4 (D) 2

72. *drosophila melanogaster* is found to be very suitable for genetic studies because

i. They could be grown in simple synthetic medium in the laboratory
ii. They complete their life – cycle in about 14 days
iii. A single matin could produce a large number of progenies
iv. Male and females are clearly distinguishable
v. It has few hereditary variations that can be seen with high power microsopes

Select how many correct statement

(A) 5 (B) 4
(C) 2 (D) 3

73. if a pea plant produces 2560 seeds during a dihybrid cross between round- yellow and wrinkled – greenplant. Them how many seed are wrinkled – yellow , round-yellow and wrinkled –green respectively

(A) 640, 480, 1280
(B) 480, 1440, 160
(C) 640, 1280, 320
(D) 160, 1440, 480

74. in *drosopohila melanoguster*, the henes white and yellow shows …..a…….recombination and genes white and miniature wing shows …….b…….linkage

(A) a → 98.7% , b → 37.2%
(B) a → 98.7% , b → 62.8%
(C) a → 1.3% , b → 37.2%
(D) a → 1.3% , b → 62.8%

75. carl correns, a rediscoverer of mendel's work belongs to

(A) Austria (B) germany
(c) Holland (D) Denmark

76. who used frequency of recombination between gene pairs on the same chromosome as a measure of distance between genes and mapped their position on chromosome?

(A) Alfred Sturtevant (B) gregor mendel

(C) correns (D) tschermak

77. walter Sutton is famous for his contribution to

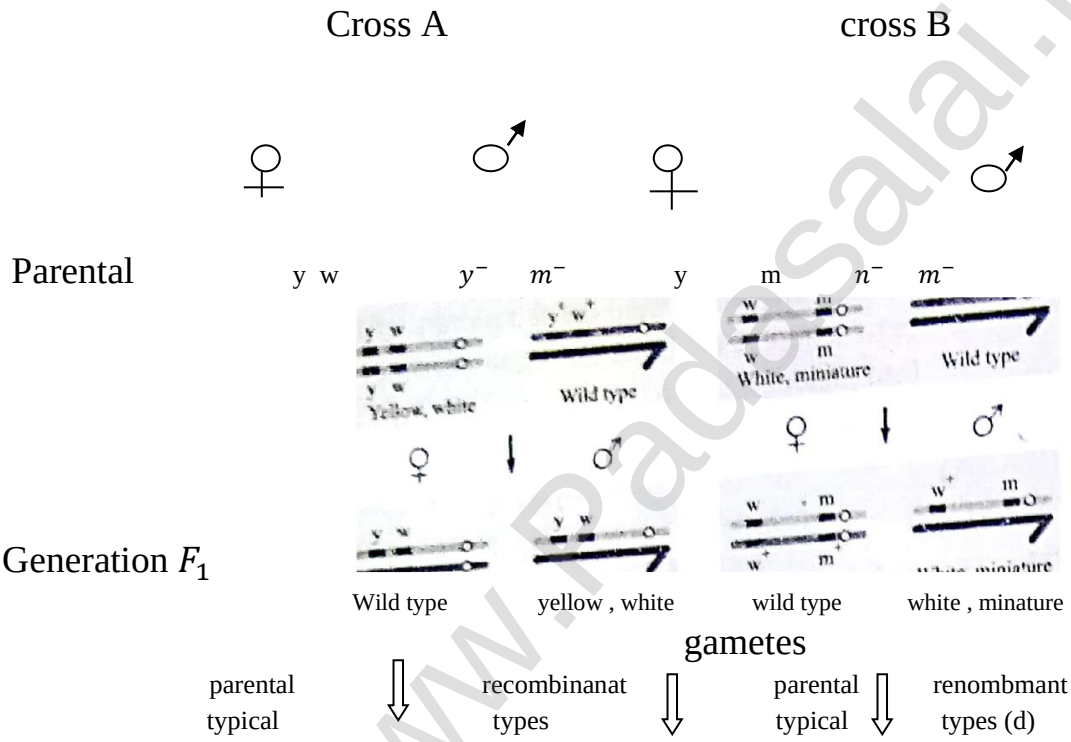
(A) chromosomal theory of ingeritance

(B) genetic engineering

(C) totipotency

(D) quantitative genetics

78. recognize the figure and findout the correct matching



(A) a – 37.2% , b – 62.8 % , c- 1.3% , d – 98.7%

(B) b – 37.2% , a – 62.8 % , d- 1.3% , – 98.7%

(C) c – 37.2% , d – 62.8 % , a- 1.3% , b – 98.7%

(D) d – 37.2% , c – 62.8 % , b- 1.3% , ad – 98.7%

79. experimental verification of chromosomal theory of inheritance was given by

(A) Thomas hunt morgan
(B) Gregor johann mendel
(C) Hugo de vries
(D) Langdon down

80. in morgan's experiments on linkage, the percentage of white eyed miniature winged renombinatins in f_2 generation is

(A) 1.3 (B) 62.8
(C) 37.2 (D) 37.5

81. the offspring of AA bb × aa BB is crossed with , aabb. The genotypic ratio of progeny will be

(A) 9:3:3:1 (B) 1:2:1
(c) 1:1:1:1 (d) 3:1

82. In a dihybrid cross, the maximum number of phenotypes would be

(A) 8 (B) 4
(C) 2 (D) 16

83. mendel did not propose

(A) Dominate
(B) Incomplete dominance
(C) Segregarion
(D) Independent assortment]

84. distance between the megenes a, b, c and d in map units is a-d = 3.5, b –c =1, a- b =6, c-d= 1.5 and a-c = 5.find out the sequence of the gene

(A) a d c b (B) a c d b
(C) a b c d (D) a c b d

85. match the genetic phenomena with their respective rations

a. inhibitory gene ratio 1. 9:3:4
b. complementary gene ratio 2. 1:1:1:1
c. dihybrid test cross ratio 3. 13:3
d. recessive epiastasis ratio 4. 12:3:1
e. dominant epistasis ratio 5. 9:7

(A) a -5, b-4, c-3, d-2,e-1
(B) a -4, b-5, c-1,d-2, e-3
(C) a -1, b-2, c-4,d-3, e-5
(D) a -2, b-1, c-4,d-5, e-3

86. A tall pea plant with round seeds (TTRR) is crossed with a dwarf wrinklw seeded plant (ttrr) . f_1 *has tall plants with* rounded seeds. What is the proportion of dwarf plants with wrinkled seeds n F_2 GENERATION?

(A) zero (B) ½

(C) ¼ (D) 1/16

87. dihybrid test cross ratio is

(A) 9:3:3:1 (B) 1:1:1:1

(C) 3:1 (D) 1:1

88. in mendel's experiments with gardenpea, round seed shape (RR) was dominant .(YY) was dominant over green cotyledons(yy) . what are expected phenotypes f_2 generation RRYY × rryy?

(A) Only wrinkled seeds with green cotyledons

(B) Only wrinkled seeds with yellow cotyledons

(C) Only round seeds with green cotyledons

(D) Round seeds with yellow cotyledons and wrinkled seeds with green cotyledons

89. which of the following is correct for dihybrid cross?

(A) 1 YYRR. 2 Yyrr, 2 yy Rr, 4 YrRr

(B) 1 YYRR. 3 Yyrr, 2 yy Rr, 3 YrRr

(C) 3 YYRR. 3 Yyrr, 2 yy Rr, 4 YrRr

(D) 1 YYRR. 2 Yyrr, 2 yy Rr, 3 YrRr

90. which of the following is the most suitable medium for culture of *drosophila melanogaster?*

(A) cow dung (B) moist bread

(C) agar agar (D) ripe banana

91. genetic maps of chromosome sare based on the frequency of

(A) No – disjunction

(B) Translocation

(C) Translocation

(D) Genetic recombination

92. for finding the different types of gametes produce by genotype AaBb, it should be crossed with genotype

(A)AABB (B) aabb

(C) AaBb (D) aaBB

93. Mendel's law of segregation in applicable to

(A) dihybrid cross only
(B) both dihybrid and monohybrid crosses
(C) monohybrid cross only
(D) dihybrid but not monohybrid cross

94. The number of henotypes produce whenindividuals genotype' YyRrTt' are crossed with each other is

(A) 4 (B) 45
(C) 28 (D) 27

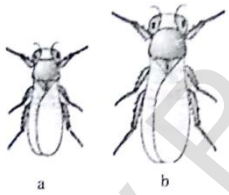
95. independent assortment can be deduced from

(A) monohybrid cross (B) test cross
(C) back cross (D) dihybrid cross

96. lack of independent assortment between two genes A and B would be due to

(A) crossing over (B) linkage
(C) repulsion (D) recombination

97. recognize the figure and find out the correct matching



(A) a- male *drosophila*, b- female *drosophila*
(B) a- female *drosophila*, b-male *drosophila*
(C) a- male *butterfly*, b-female butterfly
(D) a- female butterfly, b-male butterfly

98. Percentage of recombination between A and B is9% A and C 17% and B and C 26% . the arrangement of genes would be

(A) A-B-C (B) A-C-B
(C) B-C-A (D) B-A-C

99. Self fertilizing tri-hybrid plants from

(A) Eight different gametes and 64 different zygotes
(B) Four different and sixteen different zygotes
(C) Eight different gametes and sixteen different zygotes
(D) Eight different gamete and thirty two different zygotes

100. genetic map is one that
(A) Establishes sites of the gene on a chromosome
(B) Establishes the various stages in gene evoluthion
(C) Shows the stage during cell division
(D) Shows distribution of vgarious species in region

101.phenotypic dihybrid ratio is
(A) 9:3:3:1 (B) 15:1
(C) 9:6:1 (D) 1:2:1

102. phenotypic dihybrid ratio is
(A) 1:4:6:4:1 (B) 15:1
(C) 12:3:1 (D) 9:7

103. out of a population of 800 individuals in F_2 generation of a cross between yellow round and green wrinkled pea plants, what would be number of yellow and wrinkled seeds?
(A) 800 (B) 400
(C) 200 (D) 150

104. what is true of law of independent assortment?
(A) Applicable to all the dominant alleles
(B) Applicable to all gene s on the same chromosome
(C) Not applicable to genes present on the same chromosome
(D) Applicable to all recessive alleles

105. linkage was discovered by
(A) Blakeslee (B) sutton
(C) muller (D) bateson and punnet

106. sex-linked genes were discovered by

(A) johanssen (B) mendel

(C) morgan (D) muller

107. independent assortment is absent in vase of

(A) Genes located on the same chromosome
(B) Genes located on homolohous chromosomes
(C) Gene slocated on non-homologous chromosomes
(D) All of the above

108. source of mendelian recombination is

(A) Linkage
(B) Independent assortment
(C) Mutations
(D) Dominant traits

109. number of henotypes found in F_2progeny of a dihybrid cross is

(A) 9 (B) 6
(C) 3 (D) 1

110. linkage in plants was first shown in

(A) *zea **mays*** (B) *lathyrus odoratus*
(C) oemothera lamarckiana (D) *pisum sativum*

111. if there is complete linkage in F_2 $generation$

(A) Parental types and recombinatnts appear in equal ratio
(B) Recombinants are less than parental types
(C) Recombinants are more than parental types
(D) There will be only parental types

112.mendel did not observe linkage due to

(A) Mutation
(B) Synapsis
(C) Synapsis
(D) Independent assortment

113. In a dihybrid cross AABB × aabb, F_2 Progency of AABB, AABb, AaBB and AaBb occurs in the ration of

(A) 1:1:1:1 (B) 9:3:3:1

(C) 1:2:2:1 (D) 1:2:2:4

114. crossing over in diploid organism is responsible

(A) Dominance of genes
(B) Linkage between genes
(C) Recombination of linked genes
(D) Segregation of alleles

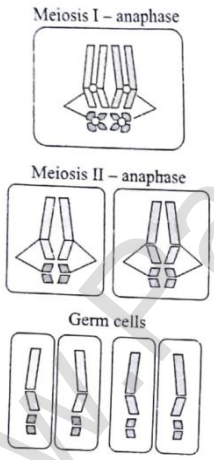
115. mendel's laws of heredity can be explained with the half of

(A) mitosis (B) meiosis
(C) cloning (D) both A and B

116. number of phenotypes possible from AaBbCc × AaBbCc is

(A) 16 (B) 9
(C) 8 (D) 4

117. the following figure shows



(A) Independent assortment of genes
(B) Linkage
(C) Chromosome theory of sex determination
(D) Independent segregation of genes

118. genotypic raton of a dihybrid cross is

(A) 12:3:1
(B) 15:1
(C) 1:2:1

(D) 1:2:2:4:1:2;1:2:1

119. mendel 's law of independent assortment is based of F_2 ratio of

(A) 1:2:1 (B) 9:3:3:1

(C) 2:1 (D) 3:1

120. mendel 's work was rediscovered in

(A) 1756 (B) 1865

(C) 1900 (D) 1910

121. mendel enunciated principles of inheritance

(A) two (B) three

(C) four (D) five

122. cross AABb × aaBb yields AaBB : AaBy : Aabb: aabb

Offspring in the ratio of

(A)0:3:1:1 (B) 1:2:1:0

(C) 1:1:1:1 (D) 1:2;1:1

123. read the following statements

I. In haplo-diploid sex – determination system, the males do not have father and thus cannot have soons, but have grandfather and can have grandsons.

II. In honey bee, workers are developed by the unfertilized egg by means of parthenogenesis

III. In human skin colour, the effect of each allele is additive

IV. In XO type sex – determination , male have half number of chromosome than the female

Select the incorrect statement

(A) i , iii (B) ii , iii

(C) ii , iv (D) i , iv

124.in certain taxon of insects some have 32 chromosome and the others have 31 chromosomes. The 31 and 31 chromosome – bearing organisms are

(A) male and females, respectively

(B) females and males, respectively

(C) drones and males, respectively

(D) males and drones, respectively

125.identify the wrong statement

(A) Human males have one sex chromosome much shorter than others

(B) In domesticated fowl, sex of progeny depends upon type of sperm that rertilizes the egg

(C) In male grasshopper, 50% of sperms have no sex chromosones

(D) Female birds produce two types of gametes based on sex chromosome

126. read the following statements and find out the correct statement.

a) The sex determination in honey bee is based on the number of sets of chromosomes an individual receives

b) An offspring formed from the union of a sperm and an egg develops as a female(queen or worker), and an unfertilized egg develops as a male drone by means of parthenogenesis

c) The females are diploid having 32 chromosomes and males are haploid, i.e., having 16 chromosomes

d) This is called as haplo –diploid sex – determination system and has special characteristic features such as the male produce sperms by mitosis they do not have father and thus cannot have sons, but have a grandfather and can have grandsons.

(A) a and b

(B) b,c and d

(C) a,c and d

(D) a,b,c and d

127. match the columns I and II , and choose the correct combination from the options given.

Column I	**column II**
a. XO type	1. Male heterogamety
b. XY type	2. Female
c. ZW type	

(A) a-1, b- 2, c-2 (B) a-2, b- 1, c-1

(C)) a-1, b- 1, c-2 (D)) a-2, b- 2, c-1

128. the initial clue about the genetic chromosomal mechanism of sex determination can be traced bank to some of the experiments carried out in

(A) humans (B) birds

(C) plants (D) insects

129.choose the wrong statement.

(A) In grasshoppers, besides autosomes, males have only one X – chromosome whereas females have a pair of X –chromosomes.

(B) In *drosophila*, males have one X –and one Y –chromosome whereas females have a pair of x- chromosome besides autosomes.

(C) In birds, females have one Z and one W – Chromosome, whereas males have a pair of Z –CHROMOSOMES BESIDES AUTOSOMES

(D) Insects with XO type of sex determination , all sperms have X – Chromosome besides autosomes.

130. ZW, XO, XY and haplo- diploid typeof sex determination in seen in respectively

(A) Parrot, cockroach, *melandrium* and honey bee

(B) *Aptenodytes, grasshopper, drosophila and apis*

(C) *Pavo, grasshopper*, man and honey bee

(D) *All of the above*

131. sex of child is due to

(A) Size of ovum

(B) Health of father

(C) Sex chromosome of father / sperm

(D) Sex chromosome of mother / ovum

132. sex is determined in human beings

(A) By ovum

(B) At time of fertilization

(C) 40 days after fertilization

(D) Seventh to eight week when genital differentiate in foetus

133. when certain character is inherited only through female parents, it probably represents

(A) Multiple plastid inheritance

(B) Cyloplasmic inheritance
(C) Incomplete dominance
(D) Mendelian nuclear inheritance

134. XY sex chromosomes were discovered by

(A) gregor johann mendel (B) M.J.D. white
(C)nettie stevens (D) Robert brown

135.genes located Y – chromosomes are

(A) mutant genes (B) sex – linked genes
(C) autosomal gene s (D) holandric genes

136. A strong mutagen is

(A) cold (B) heat
(C) water (D)X –ray

137. recognize the figure and find out the correct matching

(A) A-male, b-female
(B) A-female , b- male
(C) Cant be predicted
(D) Both A and B are possible

138. what is true in case of honey bee?

(A) Male diploid, female haploid
(B) Male haploid, female diploid
(C) Male haploid, female haploid
(D) Male haploid, female haploid

139. in human zygote male sex is determined by

(A) Strength of father
(B) Nutrition of mother
(C) Composition of required chromosome pair
(D) None of the above

140. which pteridophtye has the maximum chromosome number?

(A)*Ophioglossum retuculatum*
(B)*Azolla pinnata*
(C)*Lycopodium cernum*
(D)*Selaginella apus*

141. plant in which chromosomal basis of sex determination ws discovered first is

(A) *rumex* *(B) melandrium*
(C) *coccinia* *(D) sphaerocarpus*

142. *drosophila* melanogster possesses

(A)3 pairs autosomes + 1 pair sex chromosomes
(B) 2 pairs autosomes + 2 pair sex chromosomes
(C)1 pairs autosomes + 3 pair sex chromosomes
(D) 2 pairs autosomes + 1 pair sex chromosomes

143. foetal sex can be determined from cells present in amniotic fluid by looking for

(A) Kinetochres
(B) Chiasmata
(C) Barr bodies sex chromosomes
(D) Autosomes

144. genetic identity of human male is known by

(A) nucleolus (B) cell organelles
(C) autosomes (D) sex chromosomes

145. broadly genetic disorder may be grouped into two categories as

(A) Mendelian disorders and chromosomal disorders
(B) Autosomal disorders and sex linked disorders
(C) Recessive disorders and dominant disorders
(D) Aneuploidy and polypoidy

146. sickle cell anemia is an example of

I. Mendelian disorder
II. Genetic disorder
III. Chromosomal disorder

IV. Inborn error of metabolism
V. Point mutation'
VI. Frame – shift mutation
VII. Sex – linked disease
VIII. Recessive disorder
IX. Qualitative disorder
X. Quantative disorder
XI. Autosomal disorder

(A) I, ii , iv, v , viii, x, xi (B) i, v, viii, ix, xi

(C) i,ii,v, viii, ix, xi (D) ii, iii, v, vii , ix

147. the inheritance pattern of a gene over generation s among humans is studied by the character studied in the pedigree analysis is equivalent to

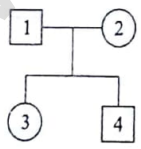
(A) qualitative trait (B) quantative trait

(C) pleotropic trait (D) mendelian trait

148. in sickle cell anaemia, the sequence of amino acids from first to seventh position of ß-chain of hemoglobin S (HbS) IS

a) His , Leu, Thr, Pro, Glu, Val, Val
b) Val, His , Leu, Thr, Pro, Glu, Glu
c) Glu, His , Leu, , Pro, Val, Glu
d) Val, His , Leu, Thr, Pro, Val, Glu

149. in this figure which of the progeny is younger?



(A) 3 (B) 4

(C) 2 (D) 1

150. which of the following is not a mendelian disorder?

(A) turner's syndrome (B) thalassemia

(C) haemophilia (D) cystic fibrosis

151. which is incorrect regarding pedigree analysis?]

(A) it helps to understand whether the trait in question is dominant or recessive.

(B) It confirms that the trait is linked to one of the autosome

(C) It helps to trace the inheritance of a specific trait/

(D) It confirms that DNA is the carrier of genetic information

152. read the following statements and choose the correct operation

I. In phenylketonuria the affected person does not secrete the enzyme to convert phenylalanine to tyrosine.]

II. Pollibility of male becoming haemophilic is extremely rare.

III. Sickle cell anaemia is caused by the substitution of glutamic acid by valine at fifth position of beta chain of haemoglobin.

IV. Myotonic dystrophy is an autosoman dominant trait

(A) I and III alone are wrong

(B) II and III alone are wrong

(C) II alone are wrong

(D) III alone is wrong

153. person affected with phenylketonuria lack an enzyme that converts amino acid phenylalanine into

(A) valine (B) proline

(C) histidine (D) tyrosine

154. which mutation/variation is not hereditary?

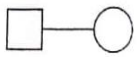
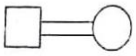
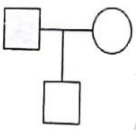
(A) genetic (B) gametic

(C) somatic (D) germinal

155. point mutation may occur due to

(A) Gain of a segment of DNA
(B) Deletion of segment of DNA
(C) Alteration in DNA sequence
(D) Change in a single base pair of DNA

156. Match the columns and choose the correct option

Column I	Column II
a. 	1. Consanguineous mating
b. 	2. Affected female
c. 	3. Mating
d. 	4. Unaffected female
e. 	5. Parents with male child unaffected
	6. Sex unspecified

(A) a – 3, b -1 , c -2 ,d -5 , e- 4
(B) a – 2, b -1 , c -6 ,d- 3, e- 4
(C) a – 3, b -4 , c - 1,d- 5, e- 2
(D) a – 3, b -1 , c -6 ,d- 5, e- 4

157. mutations are induced mostly by

(A) UV radiations (B) polyploidy

(C) alpha rays (D) gamma rays

158. the technique employed in human genetic vounselling is

(A) serological technique (B) polyploidy

(C) pedigree analysis (D) amniocentesis

159. which is not a mutagen?

(A) acetic acid (B) gamma rays

(C) nitrous acid (D) hydroxylamine

160. pattern bald ness , moustaches and beard in human male are example of

(A) sex – linked traits
(B) sex differentiating traits
(C) sex limited traits
(D) sex determining traits

161. the symbol of empty circles used in pedigree analysis represents

*(A) normal females (B) normal males
(C) affected females (D) affected males

162. muller was awarded nobel prize in 1946 for his work of

(A) protein synthesis
(B) chemistry of nucleic acids
(C) cancer
(D) X – ray induced mutations

Topic 6: mendelian disorders

163. A" disease which shows its transmission from unaffected carrier female to some of the male progeny". Find the nature of the trait

(A) autosomal recessive (B) autosomal dominant
(C) sex – linked recessive (D) sex – linked dominant

164. which is incorrect about colour blindness?

(A) This due to defect in either red or green once cone of eye resulting in failure to discriminate between red and green colour
(B) A daughter will not normally be colour blind, unless her mother is a carrier and her father is colour blind.

(C) If female has Xc X then it is called carreer but when male has then Xc Y then it will be colour blind

(D) The son of a woman who carries the gene has 25 per cent chance of being colour blind.

165. which incorrect about thalassemia?

(A) This blood disease is transmitted from parents to the offspring when both the partners are unaffected carrier for the gene(or *heterozygous.)*

(B) The defect due to either mutation or deletion which ultimately results in redudced rate of synthesis of one of the globin chains that make up haemoglobin/

(C) Thalassemia differs from sickle cell anaemia in that the former is a qualititative problem of synthesizing an incorrectly funtionning globin while the latter is a quantitative problem of synthesizing too few globin molecules/

166. read the following statements and find out the incorrect statement

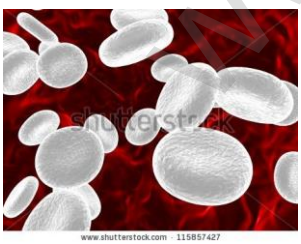
(A) Alpha thalassemia is controlled by two closely linked genes HBA 1 and HBA 2 on chromosomes 16 of each parent and it is observed due to mutation or deletion of one or more of the four genes.

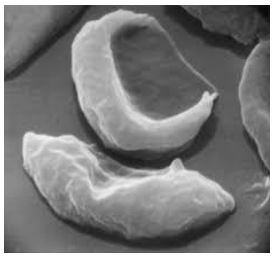
(B) Beta thalassemia is controlled by a single gene HBB oc chromosome 11 of each parent and occurs due to mutation of one or both the genes.

(C) Beta thalassemia is also called cooley's anemis\a a or thalassemia major

(D) None of the above

167. recognize the figrer and find out the correct matching.





a ---- GAG ----
---- CTC ----

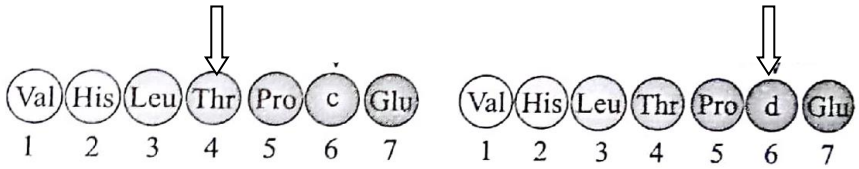
⇩

Mrna --- GAG ---

b ---- GTG ---
---- CAC ----

⇩

Mrna ---- GUG ---



(A) C- clu , d- val , a- normal Hn (A) gene, b – sickle cell Hb (S) gene.

(A) c—Glu, d—Val, a—normal Hb (A) gene, b—sickle cell Hb (S) gene

(B) c—Glu, d—Val, b—normal Hb (A) gene, a—sickle cell Hb (S) gene

(C) d—Glu, c—Val, a—normal Hb (A) gene, b—sickle cell Hb (S) gene

(D) c—Glu, d—Val, b—normal Hb (A) gene, a—sickle cell Hb (S) gene

168. how many types of genotypes are possible in the inheritance pkattern of sickle cell anaemia?

(A) 1 (B) 2

(C) 3 (D) 4

169. which of the following genotype will show ithe disased

Condition in sickle cell anaemia?

(A) Hb^AHb^A (B) Hb^AHb^S

(C) Hb^SHb^S (D) both B and C

170. Sickle cell anaemia is controlled by

(A) single allele
(B) single pair of allele
(C) multiple allele
(D) polygene

171. heterozygous (Hb^AHb^S) undividuals have how much per cent of probability of trensmossion of the mutant gene to progeny?

(A) 25% (B) 50%
(C) 75% (D) 100%

172. down's syndrome and truner's syndrome are due to respectively

(A) monosomec and nullisomic conditions
(B) trisome and monosomic conditions
(C) monosomic and trisomic conditions
(D) trisomic and tetrasomic conditions

173. match the columns

	Column I	**column II**
a. Monopploidy	1.	2n-1
b. Monosomy	2.	2n+ 1
c. Nullisomy	3.	2n-2
d. Trisomy	4.	2n-2
e. Tetrasomy	5.	n
	6.	3n

(A) a -6 , b -5 , c- 3, d -4 , e- 2
(B)a -5 , b -2 , c- 4, d -1 , e- 3
(C)a -5 , b -1 , c- 4, d -2 , e- 3
(D)a -1 , b -5 , c- 3, d -2 , e- 4

174. read the following statements and choose the correct option

i. failure of segregation of chromatids during cell division results in aneuploidy.
ii. Chromosomal disorders are mainly determined by alteration or mutation in an single gene.
iii. Thalassemia and cystic fibrosis are mendelian disorders
iv. Sickle cell anaemia is an X –linked trait
v. Haemophilia is an autosome linked recessive desease.

(A) I and III alone are correct
(B) I, III k and IV alone are correct
(C) III and IV alone are correct
(D) II and IV alone are correct

175. choose the wrond\g statements.

(A) failure of segregation of chromatids during cell division results in aneuploidy

(B) additional copy of ' X' chromosome in males results in klinefelter's syndrome.

(C) closely located genes in a chromosome always assort independently resulting in recombinations.

(D) failure of cytokinesis after DNA replication result in polypoidy

176. select the autosomal dominant, autosomal recessive, sex linked recessive and Y – sex linked recessive disorder respectively.

(A) myotonic dystrophy, SCA, haemopbilia and hyper trechosis
(B)_ huntingron 's chorea, PKU (Phenylketonuria),
(C) polydactlyly, thalassemia G –6—P Dehydrogenase deficiency and long hairs of pinna
(E) all of the above

177. numerical change in chromosome number which is not the exact multiple of haploid genome is

(A) triploid (B) allopolyploid

(C) autopolyploid (D) aneuploid

178. A colour blind man (X^C,Y) has a colour blind sist (X^CX^C) and a normal brother (XY) . what is the genoty of father and mother ?

(A) X^C Y , X^C X^C (B) X^CY, X^C , X

(c) XY , X^CX^C (D) XY, X^C X

179. Which genotype will indicate colour blindness in male?

(A) X^C Y (B) X^CY^C

(C) X^CX^C (D) A^CA^C

180. A woman with two genes, one for haemopjilia and on for color blindness on one of its X – chromosomes, marries a normal man. The progeny will be

(A) All sons haemophilic and colour blind

(B) 50% haemophilic and colour blind sons and 50% normal sons

© All daughters haemophilic and colour blind

(D) 50% haemophilic daughters and 50% colour blind daughters

181. Match the columns I ans II, and choose the correct combination from the options given.

Column I	Column II
a. Pleiotropy	1. Baldness
b. Polygenic inheritance	2. Pattern baldness
c. Autosomal recessive disorder	3. Thalassemia
d. Y – sex linked disorder	4. Phenylketonuria
e. Sex – influenced character	5. Hypertrichosis
f. Sex – limited character	6. Human ski colour

(A) a -6 , b -5 , c- 3, d -4 , e- 2

(B) a -5 , b -2 , c- 4, d -1 , e- 3

(C) a -5 , b -1 , c- 4, d -2 , e- 3

(D) a -1 , b -5 , c- 3, d -2 , e- 4

182. Down's syndrome is due to trisomy of 21st chromosome caused by

(A) Nondisjunction during egg formation

(B) Nondisjunction during sperm formation

© Addition of extra chromosome during mitosis of zygote

(D) Either A or B

183. Mental retardation in men associated with sex chromosome abnormality is due to

(A) Increase in X-complement
(B) Decrease in X-complement
(C) Large increase in Y-compliment
(D) Moderate increase in Y-complement

184. How many genomes are present in a typical green plant cell?

(A) Ten (B) Two
(C) Five (D) Three

185. Monosomics are

(A) n (B) 2n + 1
(C) 2n - 2 (D) 2n – 1

186. First child of a normal pigmented couple is albino. The possibility of second child being an albino is

(A) 25% (B) 50%
(C) 75% (D) 100%

187. Albinism is due to non-synthesis of melanin on account of absence of

(A) Melanase (B) Luciferase
(C) Tyrosinase (D) Lysine

188. In albinism, the absence of which pigment makes the skin and hair light coloured

(A) Melanin (B) Carotine
(C) Hemoglobin (D) Chlorophyll

189. Queen Victoria of England was

(A) Haemophilic carrier (B) Colour blind
(C) AIDS patient (D) Deaf

190. If haploid chromosome number is 10, the monosomic number shall be

(A) 9 (B) 18
(C) 10 (D) 19

191. Genes for colour blindness in human are carried by

(A) Mother (B) Father

(C) Both (D) Abnormal sex

192. Mental retardation in men associated with sex chromosome abnormality is due to

(A) Glumatic acid by valinen $\alpha - chain$
(B) Glumatic acid by valinen $\beta - chain$
(C) Valine by glumatic acid in $\alpha - chain$
(D) Valine by glumatic acid in $\beta - chain$

193. In humans, Philadelphia chromosomes is formed by reciprocal translocation between chromosomes

(A) 9 and 21 (B) 9 and 22
(C) 9 and 20 (D) 20 and 10

194. Mental retardation in men associated with sex chromosome abnormality is due to

(A) Sex-linked recessive
(B) Sex-linked dominant
(C) Autosomal character
(D) Sex-limited character

195. Sex-linked traits are generally

(A) Lethat (B) Recessive
(C) Dominant (D) Pleiotropic

196. Tay sach's disease is due to

(A) Sex linked recessive gene
(B) Sex linked dominant gene
(C) Autosomal dominant gene
(D) Autosomal recessive gene

197. Wilson detected colour blindness in

(A) 1921 (B) 1911

(C) 1910 (D) 1914

198. The Christmas disease patient lacks antihaemophilic

(A) Homogentisic acid oxidase

(B) Factor VIII

(C) Factor XI

(D) Factor IX

199. Ishiara charts are used by ophathalmologists for detecting

(A)eye infection (B) night blindness

(C) colour blindness (D) finger prints

200. A harm full condition which is also a potential savior from a mosquito borne infections desease

(A) thalassemia (B) sickle cell anameia

(C) leukemia (D) pernicious anaemia

201. Christmas disease is another name of

(A) sleeping sickness (B)_ down's syndrome

(C) hepatitis (D)haemophilia B

202. Acolour blind person cannot distinguish

(A) red and green (B) green and blue

(C) yellow and white (D) black and yellow

203. albinism is a result of inability of the system to convert amono acid

(A) alanini (B) tryptophan

© lysine (D) phenylalanine

204. genes for colour blindness/sex linked traits are located on

(A) X –chromosome
(B) Y – chromosome
(C) x or Y – chromosome
(D) both X and Y - chromosome

205. phenyldetonuria is genetic disorder caused by a defect in metabolism of

(A) fatty acids (B) polysaccharides
(C) amino acids (D) vitamins

206. Philadelphia chromosome occurs in patients suffering from

(A) leukemia (B) rickets
© hepatitis (D) albinism

207. A male human is heterozygous for autosomal genes A and B . he is also hemixygous for haemophilic gene h. what proportion of sperms will carry abh?

(A) 1/8 (B) 1/32
(C) ¼ (D) 1/16

208. recessive gene present on one X – chromosome of human will be

(A) lethal (B) sub –lethal
(C) expressed in males (D) expressed in female

209. haemophilia is a genetic disorder in which

(A) blood clots in blood vessels
(B) there is delayed coagulation of blood
(C) blood fails to coagulate
(Dblood cell count falls

210. Wilson disease is associated with abnormal metabolished of

(A) iron (B) potassium
(C) copper (D) iodine

211. melanuea (black urine) is caused by abnormal catabolism of

(A) alanine (B) tyrosine
(C) proline (D) tryptophan

212. which is not an X – linked recessive desease?

(A) β - thalassemia
(B) haemophilia
(C) colour blindness
(D) glucose 6 – phosphate dehydrogenase deficiency

`213. Haemophila is more common in male sbecause it is a

(A) recessive character carried by Ychromosome
(B)dominant character carried by Y chromosome
(C) dominant trait carried by X -chromosome
(D) recessive trait carreed by X - chrompsome

214. trisomy has chromosome complement of

(A) 2n -1 (B) 2n-1-1
(C) 2n+1+1 (D) 2n+1

215. Cri – du chat syndrome is human is caused by

(A) trisomy of 21 st chromosome
(B) less of half of short arm of chromosome 5
(C) loss of half of long arm of chromosome 5
(D) fertilized of an XX egg by a normal Y – Bearing sperm.

216. A Colour blind 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

Topic 7: chromosome disorders

217. chromosomal disorders are caused due to

(A) Absence of one or more chromosome
(B) Excess of one or more chromosome
(C) Abnormal arrangement of one or more chromosome
(D) All of the above

218. polyploidy condition is often seen in

(A) animals (B) humans
(C) plants (D) birds

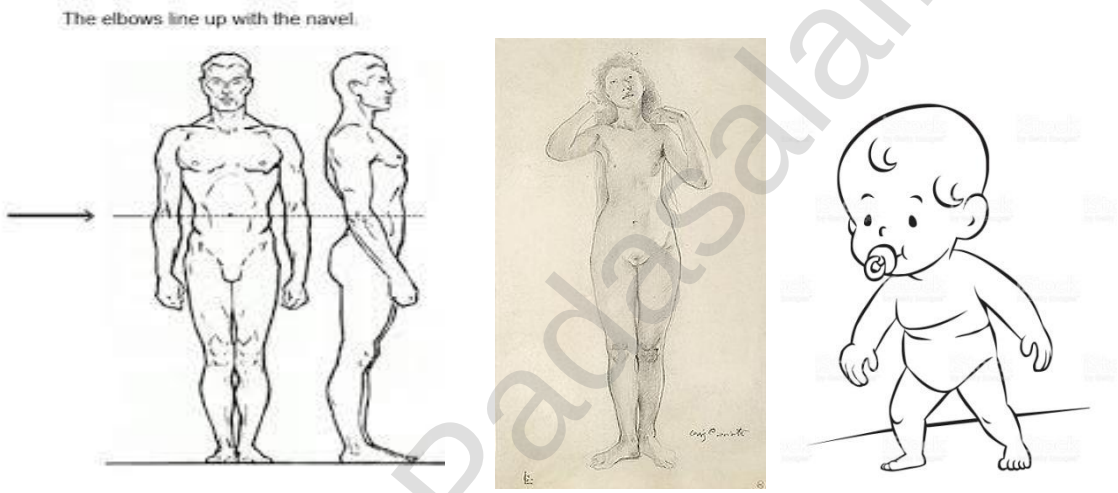
219. chromosomal condition of down's syndrome is

(A) Allosomal hypoaneuploidy
(B) Autosomal aneuploidy
(C) Allosomal hypouneuploidy
(D) Partial autosomal deletion

220. which chromosomes condition is Jacob syndrome?

(A) 44 + XO (B) 44 + XXY
(c) 44 + XYY (D0) 45+ XYY

221. Recognise the figure and find out the correct match
]



(a) (b) (c)

(A) a – down s syndrome , c – klinfelter 's syndrome, b – turner's syndrome
(B) c – down s syndrome , a – klinfelter 's syndrome, b – turner's syndrome
(C) b – down s syndrome , c – klinfelter 's syndrome, a – turner's syndrome
(D) c – down s syndrome , b – klinfelter 's syndrome, a – turner's syndrome

222. chromosome number of down ‘ s syndrome / monogolism

(A) 46 (B) 47

(C) 45 (D) 23

223. gynaeomastia is a symptom of

(A) down ‘s syndrome
(B) klinefelter ‘s syndrome
(C) turner ‘s syndrome
(D) haemophilic syndrome’

225. pick out the correct statements.

a. Haemophilia is a sex – linked recesseve character
b. Down ‘s syndrome is due to aneuploidy
c. Phenylketonuria is an autosomal dominant gene disorder
d. Phenylketonuria is an autosomal recesseve gene disorder
e. Sickle cell anaemia is an X – linked recessive gene disorder

(A) a , b , d, correct
(B) a, c, e correct
(C) a , c correct
(D) b, e correct

226. epicanthus skin fold above the eyes and transversepalmer crease are typical symptoms of

(A) cri – du – chat
(B) klinefilter ‘s syndrome
(C) down ‘s syndrome
(D) turner ‘s syndrome

227. A MONOSOMIC (2N-1) abnormality in human is

(A) klinefilter ‘s syndrome
(B) turner ‘s syndrome
(C) edward’s syndrome
(D) down ‘s syndrome

228. the chromosomal pattern of individual is shown her this individual is suffering from

(A)down ‘s syndrome (B) turner ‘s syndrome

(C) klinefilter ‘s syndrome (D) edward’s syndrome

229. frequency of down’s syndrome increase when maternal,age is

(A) below 35 years
(B) above 35 years
(C) at the time of first pregnancy
(D) after bearing three children

230. A mother afficted ;by down’s syndrome caused by an extra copy of chromosome 21. Father is normal. Percentage of offspring affected by the disorder would be

(A) 100 % (B) 75 %
© 50 % (D) 25 %