NEET QUESTION ANALYSATION 2024

GOVERNMENT OF TAMIL NADU HIGHER SEC BOTANY BOOK

BOOK BACK QUESTION	DIRECT QUESTION	INDIRECT QUESTION
2	39	9

101. Lecithin, a small molecular weight organic compound found in living tissues, is an example of:

(1) Amino acids
(2) Phospholipids
(3) Glycerides
(4) Carbohydrates

Answer (2)

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2. Bennet-Clark's Protein-Lecithin Theory:

In 1956, **Bennet-Clark** proposed that the carrier could be a protein associated with **phosphatide** called as **lecithin**. The carrier is **amphoteric** (the ability to act either as an

102. How many molecules of ATP and NADPH are required for every molecule of CO_2 fixed in the Calvin cycle?

(1) 2 molecules of ATP and 3 molecules of NADPH
(2) 2 molecules of ATP and 2 molecules of NADPH
(3) 3 molecules of ATP and 3 molecules of NADPH
(4) 3 molecules of ATP and 2 molecules of NADPH

Answer (4)

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Phase 3 – Regeneration

Regeneration of RUBP involves the formation of several intermediate compounds of 6-carbon, 5-carbon, 4-carbon and 7- carbon skeleton. Fixation of one carbon dioxide

requires 3 ATPs and 2 NADPH + H^+, and for the fixation of 6 CO_2 requires 18 ATPs and 12 NADPH + H^+ during C_3 cycle. One 6 carbon compound is the net gain to form hexose sugar.

4. For every CO_2 molecule entering the C_3 cycle, the number of ATP & NADPH required

a. 2ATP + 2NADPH
b. 2ATP + 3NADPH
c. 3ATP + 2NADPH
d. 3ATP + 3NADPH

103. Hind II always cuts DNA molecules at a particular point called recognition sequence and it consists of:

(1) 8 bp

(2) 6 bp

(3) 4 bp

(4) 10 bp

Answer (2)

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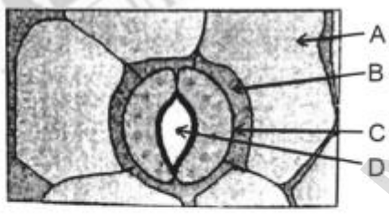
The restriction enzyme ***Hind II*** always cut DNA molecules at a point of recognising a specific sequence of six base pairs. This sequence is known s recognition sequence. Today more

104. In the given figure, which component has thin outer walls and highly thickened inner walls?



(1) C

(2) D

(3) A

(4) B

Answer (1)

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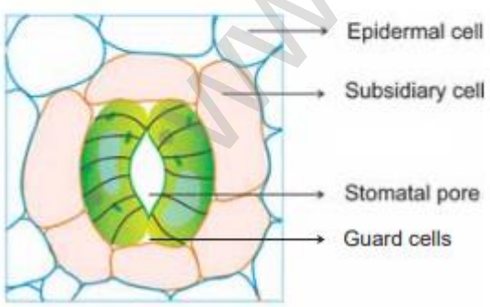
subsidiary cells or **accessory cells**. The guard cells are joined together at each end but they are free to separate to form a pore between them. The inner wall of the guard cell is thicker than the outer wall (Figure 11.14). The stoma opens to the interior into a cavity called **sub-stomatal cavity** which remains connected with the intercellular spaces.



105. The cofactor of the enzyme carboxypeptidase is :

(1) Zinc (2) Niacin

(3) Flavin (4) Haem

Answer (1)

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4. **Zinc (Zn)**: Essential for the synthesis of Indole acetic acid (Auxin) activator of carboxylases, alcohol dehydrogenase, lactic dehydrogenase, glutamic acid dehydrogenase, carboxy peptidases and tryptophan synthetase. It is absorbed as Zn^{2+} ions.

106. The capacity to generate a whole plant from any cell of the plant is called:

(1) Totipotency

(2) Micropropagation

(3) Differentiation

(4) Somatic hybridization

Answer (1)

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Totipotency

The property of live plant cells that they have the genetic potential when cultured in nutrient medium to give rise to a complete individual plant.

Choose the correct answer from the given option:

1. 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.

HGR1CV

107. Match List I with List II

	List-I		List-II
A.	*Rhizopus*	I.	Mushroom
B.	*Ustilago*	II.	Smut fungus
C.	*Puccinia*	III.	Bread mould
D.	*Agaricus*	IV.	Rust fungus

Choose the correct answer from the options given below:

(1) A-III, B-II, C-IV, D-I

(2) A-I, B-III, C-II, D-IV

(3) A-III, B-II, C-I, D-IV

(4) A-IV, B-III, C-II, D-I

Answer (1)

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Rhizopus is a saprophytic fungus and grows on substrates like bread, jelly, leather, decaying vegetables and fruits. It

Rust of wheat	*Puccinia graminis tritici*

It is a saprophytic fungus found on wood logs, manure piles, fresh litter, pastures etc., The fruit bodies are the visible part of the fungi. They are found in rings in some species like *Agaricus arvensis*, *Agaricus tabularis* and hence popularly called 'Fairy rings". *Agaricus campestris* is the most common 'field mushroom'.

108. Given below are two statements:

Statement I : Bt toxins are insect group specific and coded by a gene *cry* IAc.

Statement II : Bt toxin exists as inactive protoxin in *B. thuringiensis*. However, after ingestion by the insect the inactive protoxin gets converted into active form due to acidic pH of the insect gut.

In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are true

(2) Both Statement I and Statement II are false

(3) Statement I is true but Statement II is false

(4) Statement I is false but Statement II is true

Answer (3)

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Strains of the bacterium *Bacillus thuringiensis* produce over 200 different Bt toxins, each harmful to different insects. Most Bt toxins are insecticidal to the larvae of moths and butterflies, beetles, cotton bollworms and gatflies but are harmless to other forms of life.

The genes are encoded for toxic crystals in the Cry group of endotoxin. When insects attack and eat the cotton plant the Cry toxins are dissolved in the insect's stomach.

The epithelial membranes of the gut block certain vital nutrients thereby sufficient regulation of potassium ions are lost in the insects and results in the death of epithelial cells in the intestine membrane which leads to the death of the larvae.

109. Which of the following is an example of actinomorphic flower?

(1) *Datura*

(2) *Cassia*

(3) *Pisum*

(4) *Sesbania*

Answer (1)

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Flower: Ebracteate, pedicellate, white, bisexual, actinomorphic, heterochlamydeous, pentamerous, hypogynous white.

110. The type of conservation in which the threatened species are taken out from their natural habitat and placed in special setting where they can be protected and given special care is called;

(1) *in-situ* conservation

(2) Biodiversity conservation

(3) Semi-conservative method

(4) Sustainable development

Answer (2)

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8.7 Conservation

India due to its topography, geology and climate patterns has diverse life forms. Now this huge diversity is under threat due to many environmental issues for this conservation becomes an important tool by which we can reduce many species getting lost from our native land. By employing conservation management strategies like germplasm conservation, in situ, ex-situ, in-vitro methods, the endemic as well as threatened species can be protected

111. Identify the set of correct statement:

A. The flowers of *Vallisneria* are colourful and produce nectar.

B. The flowers of waterlily are not pollinated by water.

C. In most of water-pollinated species, the pollen grains are protected from wetting.

D. Pollen grains of some hydrophytes are long and ribbon like.

E. In some hydrophytes, the pollen grains are carried passively inside water.

Choose the correct answer from the options given below.

(1) C, D and E only

(2) A, B, C and D only

(3) A, C, D and E only

(4) B, C, D and E only

Answer (4)

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2. Hydrophily: Pollination by water is called hydrophily and the flowers pollinated by water are said to be **hydrophilous** (Example: *Vallisneria*, *Hydrilla*). Though there are a number of aquatic plants, only in few plants pollination takes place by water. The floral envelop of hydrophilous plants are reduced or absent. In water plants like *Eichhornia* and water lilly pollination takes place through wind or by insects. There are two types of hydrophily, Epihydrophily and Hypohydrophily. In most of the hydrophilous flowers, the pollen grains possesses mucilage covering which protects them from wetting.

112. The lactose present in the growth medium of bacteria is transported to the cell by the action of

(1) Beta-galactosidase

(2) Acetylase

(3) Permease

(4) Polymerase

Answer (3)

113. Match List I with List II

	List I		**List II**
A.	*Clostridium butylicum*	I.	Ethanol
B.	*Saccharomyces cerevisiae*	II.	Streptokinase
C.	*Trichoderma polysporum*	III.	Butyric acid
D.	*Streptococcus sp.*	IV.	Cyclosporin-A

Choose the correct answer from the options given below:

(1) A-III, B-I, C-II, D-IV

(2) A-II, B-IV, C-III, D-I

(3) A-III, B-I, C-IV, D-II

(4) A-IV, B-I, C-III, D-II

Answer (3)

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7. Alcohol and Acetone (i) Butyl alcohol (ii) Methyl alcohol	*Clostridium acetobutylicum*

Which of the following is correctly matched for the product produced by them? (NEET – 2017)

a. *Acetobacter acetic* : Antibiotics

b. *Methanobacterium* : Lactic acid

c. *Penicillium notatum* : Acetic acid

d. Saccharomyces cerevisiae : Ethanol

114. The equation of Verhulst-Pearl logistic growth is $\frac{dN}{dt} = rN\left[\frac{K-N}{K}\right]$.

From this equation, K indicates:

(1) Intrinsic rate of natural increase

(2) Biotic potential

(3) Carrying capacity

(4) Population density

Answer (3)

115. Auxin is used by gardeners to prepare weed-free lawns. But no damage is caused to grass as auxin

(1) promotes apical dominance.

(2) promotes abscission of mature leaves only.

(3) does not affect mature monocotyledonous plants.

(4) can help in cell division in grasses, to produce growth.

Answer (3)

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- Suppression of growth in lateral bud by apical bud due to auxin produced by apical bud is termed as **apical dominance.**

11. Agricultural role

- It is used to eradicate weeds. Example: 2,4-D and 2,4,5-T.
- It is responsible for initiation and promotion of cell division in cambium, which is responsible for the secondary growth and tumor. This property of induction of cell division has been exploited for tissue culture techniques

116. Identify the part of the seed from the given figure which is destined to form root when the seed germinates.

(1) A

(2) B

(3) C

(4) D

Answer (3)

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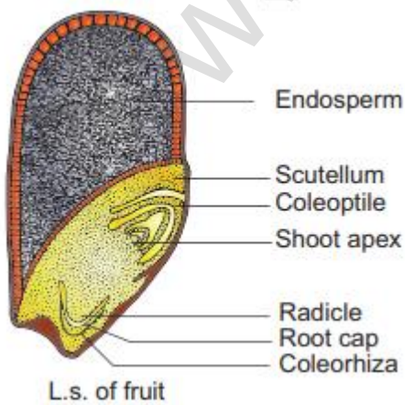

L.s. of fruit

117. Given below are two statements:

Statement I : Parenchyma is living but collenchyma is dead tissue.

Statement II : Gymnosperms lack xylem vessels but presence of xylem vessels is the characteristic of angiosperms.

In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are true

(2) Both Statement I and Statement II are false

(3) Statement I is true but Statement II is false

(4) Statement I is false but Statement II is true

Answer (4)

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Table 9.1: Different types of tissues

	Distribution	Main functions	Nature	Cell shape	Wall materials
Parenchyma	Cortex, Pith medullary rays and Packing tissues in vascular system	Packing tissue, support, gaseous exchange, food storage	Living	Usually Isodiametric	Mainly Cellulose and Pectinase
Collenchyma	Outer region of cortex as in angles of stems, mid-rib of leaves	Mechanical	Living	Elongated, Polygonal	Mainly Cellulose, Pectin and Hemi-cellulose

The secondary wall thickening of vessels are annular, spiral, scalariform, reticulate, or pitted as in tracheids, Vessels are chief water conducting elements in Angiosperms and absent in Pteridophytes and Gymnosperms. In *Gnetum* of Gymnosperm, vessels occur. The main

118. These are regarded as major causes of biodiversity loss:

A. Over exploitation

B. Co-extinction

C. Mutation

D. Habitat loss and fragmentation

E. Migration

Choose the correct option:

(1) A, C and D only

(2) A, B, C and D only

(3) A, B and E only

(4) A, B and D only

Answer (4)

119. Which one of the following is not a criterion for classification of fungi?

(1) Morphology of mycelium

(2) Mode of nutrition

(3) Mode of spore formation

(4) Fruiting body

Answer (2)

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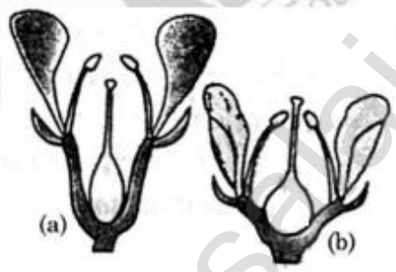
1.5.4 Classification of Fungi

Many mycologists have attempted to classify fungi based on vegetative and reproductive characters. Traditional classifications categorise fungi into 4 classes – Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.

120. Identify the type of flowers based on the position of calyx, corolla and androecium with respect to the ovary from the given figures (a) and (b)



(1) (a) Epigynous; (b) Hypogynous

(2) (a) Hypogynous; (b) Epigynous

(3) (a) Perigynous; (b) Epigynous

(4) (a) Perigynous; (b) Perigynous

Answer (4)

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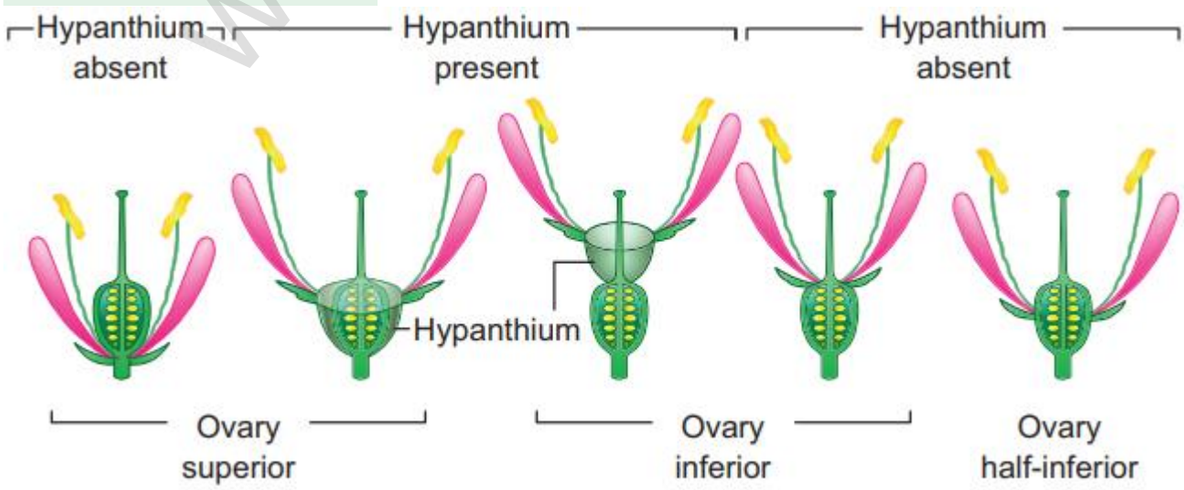
Perigynous:

The term is used for a hypanthium attached at the base of a superior ovary.



121. List of endangered species was released by-

(1) GEAC

(2) WWF

(3) FOAM

(4) IUCN

Answer (4)

12th (SCERT) STATE BOARD ZOOLOGY BOOK WORD

1998 ஆம் ஆண்டில் 1102 விலங்கினங்களும் மற்றும் 1197 தாவர இனங்களும் IUCN சிவப்பு பட்டியலில் இடம் பெற்றுள்ளன. 2012 ஆம் ஆண்டில் வெளியான IUCN சிவப்பு பட்டியலில் 3079 விலங்கினங்களும் மற்றும் 2655 தாவர இனங்களும் உலகமெங்கும் அழிந்து வரும் இனங்கள் (EN) என பட்டியலிடப்பட்டுள்ளது.

122. What is the fate of a piece of DNA carrying only gene of interest which is transferred into an alien organism?

A. The piece of DNA would be able to multiply itself independently in the progeny cells of the organism.

B. It may get integrated into the genome of the recipient.

C. It may multiply and be inherited along with the host DNA.

D. The alien piece of DNA is not an integral part of chromosome.

E. It shows ability to replicate.

Choose the correct answer from the options given below:

(1) A and B only

(2) D and E only

(3) B and C only

(4) A and E only

Answer (3)

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ori gene for origin for replication and inc gene for incompatibility. T-DNA of Ti-Plasmid is stably integrated with plant DNA. Agrobacterium plasmids have been used for introduction of genes of desirable traits into plants.

- Selection of the transformed host cells that is carrying the rDNA and allowing them to multiply thereby multiplying the rDNA molecule.

123. Which one of the following can be explained on the basis of Mendel's Law of Dominance?

A. Out of one pair of factors one is dominant and the other is recessive.

B. Alleles do not show any expression and both the characters appear as such in F_2 generation.

C. Factors occur in pairs in normal diploid plants.

D. The discrete unit controlling a particular character is called factor.

E. The expression of only one of the parental characters is found in a monohybrid cross.

Choose the correct answer from the options given below:

(1) A, B and C only

(2) A, C, D and E only

(3) B, C and D only

(4) A, B, C, D and E

Answer (2)

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The Law of Dominance: The characters are controlled by discrete units called factors which occur in pairs. In a dissimilar pair of factors one member of the pair is dominant and the other is recessive. This law gives an explanation to the monohybrid cross (a) the expression of only one of the parental characters in F_1 generation and (b) the expression of both in the F_2 generation. It also explains the proportion of 3:1 obtained at the F_2

124. Inhibition of Succinic dehydrogenase enzyme by malonate is a classical example of:

(1) Cofactor inhibition

(2) Feedback inhibition

(3) Competitive inhibition

(4) Enzyme activation

Answer (3)

125. Formation of interfascicular cambium from fully developed parenchyma cells is an example for

(1) Differentiation

(2) Redifferentiation

(3) Dedifferentiation

(4) Maturation

Answer (3)

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2. Dedifferentiation

The living differentiated cells which had lost capacity to divide, regain the capacity to divide under certain conditions. Hence, dedifferentiation is the regaining of the ability of cell division by the differentiated cells. Example: Interfascicular cambium and Vascular cambium.

126. Spindle fibers attach to kinetochores of chromosomes during

(1) Prophase (2) Metaphase

(3) Anaphase (4) Telophase

Answer (2)

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Metaphase

Chromosomes (two sister chromatids) are attached to the spindle fibres by kinetochore of the centromere. The spindle fibres is made up of tubulin. The alignment of chromosome into compact group at the equator of the cell is known as **metaphase plate**. This is the stage

127. Tropical regions show greatest level of species richness because

A. Tropical latitudes have remained relatively undisturbed for millions of years, hence more time was available for species diversification.

B. Tropical environments are more seasonal.

C. More solar energy is available in tropics.

D. Constant environments promote niche specialization.

E. Tropical environments are constant and predictable.

Choose the correct answer from the options given below.

(1) A, C, D and E only (2) A and B only

(3) A, B and E only (4) A, B and D only

Answer (1)

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Vegetation refers to the plant cover of an area. Geographically, India and Tamil Nadu show tropical climate. Hence it has rich vegetation (Forest vegetation, Grassland vegetation, Riparian vegetation, Aquatic and semi aquatic vegetation). According to

1. **Tropical wet evergreen forests**

This type is found at an altitude of nearly 1500 m on the slopes of hills and mountains .These are also called tropical rain forests or tropical wet evergreen forests, where annual rainfall is more than 250 cm.. Vegetation consists of luxuriantly growing huge trees of more than 45 m in height, shrubs, lianas and abundant epiphytes. The

Megatherms: (Temperature more than 240°C) Where high temperature prevails throughout the year and the dominant vegetation is tropical rain forest.

Mesotherms: (Temperature ranges between 170°C and 240°C) Where high temperature alternates with low temperature and the dominant vegetation is tropical deciduous forest.

128. Given below are two statements:

Statement I : Chromosomes become gradually visible under light microscope during leptotene stage.

Statement II : The beginning of diplotene stage is recognized by dissolution of synaptonemal complex.

In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are true

(2) Both Statement I and Statement II are false

(3) Statement I is true but Statement II is false

(4) Statement I is false but Statement II is true

Answer (1)

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Leptotene – Chromosomes are visible under light microscope. Condensation of chromosomes takes place. Paired sister chromatids begin to condense.

Diplotene – Synaptonemal complex disassembled and dissolves. The homologous chromosomes remain attached at one or more points where crossing over has taken place. These points of attachment where 'X' shaped structures occur at the sites of crossing over is called **Chiasmata**.

129. Match List I with List II

	List-I		List-II
A.	Nucleolus	I.	Site of formation of glycolipid
B.	Centriole	II.	Organization like the cartwheel
C.	Leucoplasts	III.	Site for active ribosomal RNA synthesis
D.	Golgi apparatus	IV.	For storing nutrients

Choose the correct answer from the options given below:

(1) A-III, B-II, C-IV, D-I (2) A-II, B-III, C-I, D-IV

(3) A-III, B-IV, C-II, D-I (4) A-I, B-II, C-III, D-IV

Answer (1)

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- DNA duplication and transcription takes place in the nucleus.
- In nucleolus ribosomal biogenesis takes place.

6.6.13 Centrioles

Centriole consist of nine triplet peripheral fibrils made up of tubulin. The central part of the centriole is called **hub**, is connected to the tubules of the peripheral triplets by radial spokes (9+0 pattern). The centriole form the basal body of cilia or flagella and spindle fibers which forms the spindle apparatus in animal cells. The membrane is absent

Leucoplasts
(Colourless Plastids store food materials)
Amyloplast – stores – starch
Elaioplast – store – lipids (oils) Seed of monocot and dicots.
Aleuroplast (or) **Proteoplast** store – Protein

Functions:

- Glycoproteins and glycolipids are produced
- Transporting and storing lipids.

130. Bulliform cells are responsible for

(1) Inward curling of leaves in monocots.

(2) Protecting the plant from salt stress.

(3) Increased photosynthesis in monocots.

(4) Providing large spaces for storage of sugars.

Answer (1)

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Some cells of upper epidermis (Example: Grasses) are larger and thin walled. They are called **bulliform cells or motor cells.** These cells are helpful for the rolling and unrolling of the leaf according to the weather change. Some of the epidermal cells of the grasses are filled with silica. They are called **silica cells.**

131. A pink flowered Snapdragon plant was crossed with a red flowered Snapdragon plant. What type of phenotype/s is/are expected in the progeny?

(1) Only red flowered plants

(2) Red flowered as well as pink flowered plants

(3) Only pink flowered plants

(4) Red, Pink as well as white flowered plants

Answer (2)

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of function. The F_1 intermediate phenotype heterozygote (R^1R^2) has one copy of the allele R^1. R^1 produces 50% of the functional protein resulting in half of the pigment of red flowered plant and so it is pink. The

132. A transcription unit in DNA is defined primarily by the three regions in DNA and these are with respect to upstream and down stream end;

(1) Repressor, Operator gene, Structural gene

(2) Structural gene, Transposons, Operator gene

(3) Inducer, Repressor, Structural gene

(4) Promotor, Structural gene, Terminator

Answer (4)

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For achieving genetic transformation in plants, the basic pre-requisite is the construction of a vector which carries the gene of interest flanked by the necessary controlling sequences, i.e., the promoter and terminator, and deliver the genes into the host plant. There are two kinds of gene transfer methods in plants. It includes:

133. In a plant, black seed color (BB/Bb) is dominant over white seed color (bb). In order to find out the genotype of the black seed plant, with which of the following genotype will be cross it?

(1) BB

(2) bb

(3) Bb

(4) BB/Bb

Answer (2)

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determine the genotype of a tall plant Mendel crossed the plants from F_2 with the homozygous recessive dwarf plant. This he called a test cross. The progenies of the test cross can be easily analysed to predict the genotype of the plant or the test organism. Thus in a typical test cross an organism (pea plants) showing dominant phenotype (whose genotype is to be determined) is crossed with the recessive parent instead of self crossing. Test cross is used to identify whether an individual is homozygous or heterozygous for dominant character.

134. Which of the following are required for the dark reaction of photosynthesis?

A. Light
B. Chlorophyll
C. CO_2
D. ATP
E. NADPH

Choose the correct answer from the options given below:

(1) A, B and C only
(2) B, C and D only
(3) C, D and E only
(4) D and E only

Answer (3)

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2. Dark reaction (Biosynthetic phase): Fixation and reduction of CO_2 into carbohydrates with the help of assimilatory power produced during light reaction. This reaction does not require light and is not directly light driven. Hence, it is called as **Dark reaction or Calvin-Benson cycle** (Figure 13.10).

$6CO_2 + 18ATP + 12NADPH + H^+ \longrightarrow C_6H_{12}O_6 + 6H_2O + 18ADP + 18Pi + 12NADP^+$

135. Match List I with List II

	List I		List II
A.	Two or more alternative forms of a gene	I.	Back cross
B.	Cross of F_1 progeny with homozygous recessive parent	II.	Ploidy
C.	Cross of F_1 progeny with any of the parents	III.	Allele
D.	Number of chromosome sets in plant	IV.	Test cross

Choose the correct answer from the options given below:

(1) A-I, B-II, C-III, D-IV

(2) A-II, B-I, C-III, D-IV

(3) A-III, B-IV, C-I, D-II

(4) A-IV, B-III, C-II, D-I

Answer (3)

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2.2.3 Terminology related to Mendelism

Mendel noticed two different expressions of a trait – Example: Tall and dwarf. Traits are expressed in different ways due to the fact that a gene can exist in alternate forms (versions) for the same trait is called **alleles.**

2. 3.2 Test cross

Test cross is crossing an individual of unknown genotype with a homozygous recessive.

2.3.3 Back cross

- Back cross is a cross of F_1 hybrid with any one of the parental genotypes. The back cross is of two types; they are dominant back cross and recessive back cross.

Sometimes the chromosome number of somatic cells are changed due to addition or elimination of individual chromosome or basic set of chromosomes. This condition in known as **numerical chromosomal aberration** or **ploidy**. There are two types of ploidy.

136. The DNA present in chloroplast is:

(1) Linear, double stranded

(2) Circular, double stranded

(3) Linear, single stranded

(4) Circular, single stranded

Answer (2)

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Grana (singular: Granum) are formed when many of these thylakoids are stacked together like pile of coins. Light is absorbed and converted into chemical energy in the granum, which is used in stroma to prepare carbohydrates. Thylakoid contain chlorophyll pigments. The chloroplast contains osmophilic granules, 70s ribosomes, DNA (circular and non histone) and RNA.

137. Match List I with List II

List I		List II	
A.	Robert May	I.	Species-Area relationship
B.	Alexander von Humboldt	II.	Long term ecosystem experiment using out door plots
C.	Paul Ehrlich	III.	Global species diversity at about 7 million
D.	David Tilman	IV.	Rivet popper hypothesis

Choose the correct answer from the options given below:

(1) A-II, B-III, C-I, D-IV

(2) A-III, B-I, C-IV, D-II

(3) A-I, B-III, C-II, D-IV

(4) A-III, B-IV, C-II, D-I

Answer (2)

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1807 Alexander Von Humboldt considered the original sources of most useful plants and their origin is an impenetrable secret.

Robert Constanza and his colleagues estimated the value of global ecosystem services based on various parameters. According to them in 1997, the average global value of ecosystems services estimated was US $ 33 trillion a year. The updated estimate for the total global ecosystem services in 2011 is US $ 125 trillion / year, indicating a four-fold increase in ecosystem services from 1997 to 2011.

138. Match List I with List II

	List I		List II
A.	Rose	I.	Twisted aestivation
B.	Pea	II.	Perigynous flower
C.	Cotton	III.	Drupe
D.	Mango	IV.	Marginal placentation

Choose the correct answer from the options given below :

(1) A-II, B-IV, C-I, D-III

(2) A-I, B-II, C-III, D-IV

(3) A-IV, B-III, C-II, D-I

(4) A-II, B-III, C-IV, D-I

Answer (1)

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Perigynous flowers are found in [AIPMT-2015]

a. Rose b. Guava

c. Cucumber d. China rose

Marginal
It is with the placentae along the margin of a unicarpellate ovary. Example:Fabaceae.

b) Drupe: Fruit develops from monocarpellary, superior ovary. It is usually one seeded. Pericarp is differentiated into outer skinny epicarp, fleshy and pulpy mesocarp and hard and stony endocarp around the seed. Example: Mango, Coconut.

139. Which of the following statement is correct regarding the process of replication in *E.coli*?

(1) The DNA dependent DNA polymerase catalyses polymerization in one direction that is 3' → 5'

(2) The DNA dependent RNA polymerase catalyses polymerization in one direction, that is 5' → 3'

(3) The DNA dependent DNA polymerase catalyses polymerization in 5' → 3' as well as 3' → 5' direction

(4) The DNA dependent DNA polymerase catalyses polymerization in 5' → 3' direction

Answer (4)

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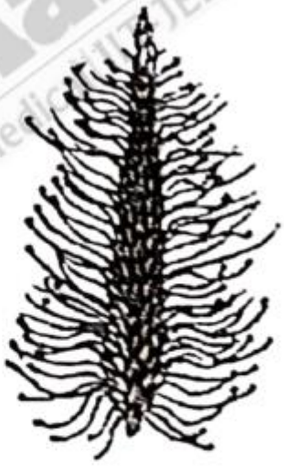
EcoRI	Escherichia coli	5'G/AATTC3' 3'CCTAG/G5'	G A-A-T-T-C C-T-T-A-A G	Sticky ends

140. Identify the correct description about the given figure:



(1) Wind pollinated plant inflorescence showing flowers with well exposed stamens.

(2) Water pollinated flowers showing stamens with mucilaginous covering.

(3) Cleistogamous flowers showing autogamy.

(4) Compact inflorescence showing complete autogamy

Answer (1)

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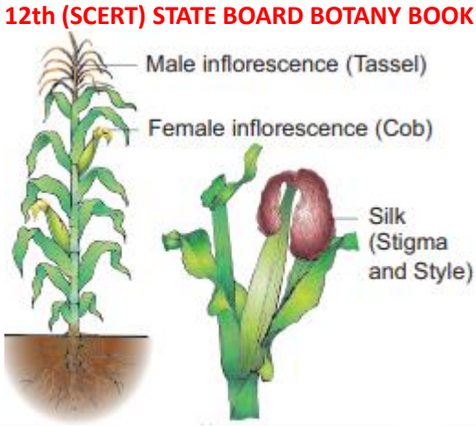

141. Match List I with List II

	List I		List II
A.	Citric acid cycle	I.	Cytoplasm
B.	Glycolysis	II.	Mitochondrial matrix
C.	Electron transport system	III.	Intermembrane space of mitochondria
D.	Proton gradient	IV.	Inner mitochondrial membrane

Choose the correct answer from the options given below:

(1) A-I, B-II, C-III, D-IV

(2) A-II, B-I, C-IV, D-III

(3) A-III, B-IV, C-I, D-II

(4) A-IV, B-III, C-II, D-I

Answer (2)

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14.5.3 Krebs cycle or Citric acid cycle or TCA cycle:

Two molecules of acetyl CoA formed from link reaction now enter into Krebs cycle. It is named after its discoverer, German Biochemist **Sir Hans Adolf Krebs** (1937). The enzymes necessary for TCA cycle are found in mitochondrial matrix except succinate dehydrogenase enzyme which is found in mitochondrial inner membrane (Figure 14.7).

14.5.1 Glycolysis

(*Gr: Glykos* = Glucose, *Lysis* = Splitting) Glycolysis is a linear series of reactions in which 6-carbon glucose is split into two molecules of 3-carbon pyruvic acid. The enzymes which are required for glycolysis are present in the cytoplasm (Figure 14.6). The reactions of glycolysis were worked out in yeast cells by three scientists **Gustav Embden** (German), **Otto Meyerhoff** (German) and **J Parnas** (Polish) and so it is also called as **EMP pathway**. It is the

14.5.4 Electron Transport Chain (ETC) (Terminal oxidation)

CQIQGM

During glycolysis, link reaction and Krebs cycle the respiratory substrates are oxidised at several steps and as a result many reduced coenzymes NADH + H^+ and $FADH_2$ are produced. These reduced coenzymes are transported to inner membrane of mitochondria and are converted back to their oxidised forms produce electrons and protons. In mitochondria, the inner membrane is folded in the form of finger projections electron, proton carrier located within the inner membrane of mitochondria.

142. Read the following statements and choose the set of correct statements:

In the members of Phaeophyceae,

A. Asexual reproduction occurs usually by biflagellate zoospores.

B. Sexual reproduction is by oogamous method only.

C. Stored food is in the form of carbohydrates which is either mannitol or laminarin.

D. The major pigments found are chlorophyll a, c and carotenoids and xanthophyll.

E. Vegetative cells have a cellulosic wall, usually covered on the outside by gelatinous coating of algin.

Choose the correct answer from the options given below:

(1) A, B, C and D only

(2) B, C, D and E only

(3) A, C, D and E only

(4) A, B, C and E only

Answer (3)

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Phaeophyceae	Chlorophyll a and c, Xanthophyll	Two unequal whiplash and tinsel lateral flagella	Laminarin starch and fats

The Pigments include Chlorophyll a, c, carotenoids and Xanthophylls. A golden brown pigment called fucoxanthin is present and it gives shades of colour from olive green to brown to the algal members of this group. Mannitol and Laminarin are the reserve food materials. Motile reproductive structures are present. Two laterally inserted unequal flagella are present. Among these one is whiplash and another is tinsel. Although sexual reproduction ranges from isogamy to Oogamy. Most of the forms show Oogamous type. Alternation of generation is present (isomorphic, heteromorphic or diplontic). Examples for this group include *Sargassum*, *Laminaria*, *Fucus* and *Dictyota*.

143. In an ecosystem if the Net Primary Productivity (NPP) of first trophic level is $100x$ (kcal m^{-2}) yr^{-1}, what would be the GPP (Gross Primary Productivity) of the third trophic level of the same ecosystem?

(1) $\frac{x}{10}(\text{kcal m}^{-2})\text{yr}^{-1}$

(2) $x(\text{kcal m}^{-2})\text{yr}^{-1}$

(3) $10x(\text{kcal m}^{-2})\text{yr}^{-1}$

(4) $\frac{100x}{3x}(\text{kcal m}^{-2})\text{yr}^{-1}$

Answer (3)

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NPP = GPP – Respiration

144. Match **List-I** with **List-II**

List-I		**List-II**
A. GLUT-4	I.	Hormone
B. Insulin	II.	Enzyme
C. Trypsin	III.	Intercellular ground substance
D. Collagen	IV.	Enables glucose transport into cells

Choose the correct answer from the options given below.

(1) A-IV, B-I, C-II, D-III

(2) A-I, B-II, C-III, D-IV

(3) A-II, B-III, C-IV, D-I

(4) A-III, B-IV, C-I, D-II

Answer (1)

145. Identify the step in tricarboxylic acid cycle, which does not involve oxidation of substrate.

(1) Malic acid → Oxaloacetic acid

(2) Succinic acid → Malic acid

(3) Succinyl-CoA → Succinic acid

(4) Isocitrate → α-ketoglutaric acid

Answer (3)

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TCA cycle starts with condensation of acetyl CoA with oxaloacetate in the presence of water to yield citrate or citric acid. Therefore, it is also known as **Citric Acid Cycle (CAC)** or **Tri Carboxylic Acid (TCA) cycle**. It is followed by the action of different enzymes in cyclic manner. During the conversion of succinyl CoA to succinate by the enzyme succinyl CoA synthetase or succinate thiokinase, a molecule of ATP synthesis from substrate without entering the electron transport chain is called **substrate level phosphorylation**. In

146. Given below are two statements:

Statement I: In C_3 plants, some O_2 binds to RuBisCO, hence CO_2 fixation is decreased.

Statement II: In C_4 plants, mesophyll cells show very little photorespiration while bundle sheath cells do not show photorespiration.

In the light of the above statements, choose the *correct* answer from the options given below:

(1) Both Statement I and Statement II are true

(2) Both Statement I and Statement II are false

(3) Statement I is true but Statement II is false

(4) Statement I is false but Statement II is true

Answer (3)

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9. Less efficient due to higher photorespiration	9. More efficient due to less photorespiration
10. RUBP carboxylase enzyme used for fixation	10. PEP carboxylase and RUBP carboxylase used
11. 18 ATPs used to synthesize one glucose	11. Consumes 30 ATPs to produce one glucose.
12. Efficient at low CO_2	12. Efficient at higher CO_2

147. Match List I with List II

	List I (Types of Stamens)		List II (Example)
A.	Monoadelphous	I.	Citrus
B.	Diadelphous	II.	Pea
C.	Polyadelphous	III.	Lily
D.	Epiphyllous	IV.	China-rose

Choose the correct answer from the options given below:

(1) A-IV, B-II, C-I, D-III

(2) A-IV, B-I, C-II, D-III

(3) A-I, B-II, C-IV, D-III

(4) A-III, B-I, C-IV, D-II

Answer (1)

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1. **Monadelphous:** Filaments of stamens connate into a single bundle. Example: malvaceae (chinarose,cotton).

2. **Diadelphous**: Filaments of stamens connate into two bundles. Example: Fabaceae, pea.

3. **Polyadelphous**: Filaments connate into many bundles. Example: *Citrus*, *Bombax*

148. Match List I with List II

List I	List II
A. Frederick Griffith	I. Genetic code
B. Francois Jacob & Jacque	II. Semi-conservative mode of DNA replication
C. Har Gobind Khorana	III. Transformation
D. Meselson & Stahl	IV. *Lac* operon

Choose the correct answer from the options given below:

(1) A-III, B-II, C-I, D-IV

(2) A-III, B-IV, C-I, D-II

(3) A-II, B-III, C-IV, D-I

(4) A-IV, B-I, C-II, D-III

Answer (2)

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2. Transformation

Transfer of DNA from one bacterium to another is called transformation (Figure 1.14). In 1928 the bacteriologist Frederick Griffith demonstrated transformation in Mice using *Diplococcus pneumoniae*. Two strains of this bacterium are present. One strain

1979 – Development of Artificial gene – functioning within the living cells by H.G. Khorana

149. Which of the following are fused in somatic hybridization involving two varieties of plants?

(1) Callus

(2) Somatic embryos

(3) Protoplasts

(4) Pollens

Answer (3)

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3. Protoplast Culture:

Protoplasts are cells without a cell wall, but bounded by a cell membrane or plasma membrane. Using protoplasts, it is possible to regenerate whole plants from single cells and also develop somatic hybrids. The steps involved in protoplast culture.

150. Spraying sugarcane crop with which of the following plant growth regulators, increases the length of stem, thus, increasing the yield?

(1) Auxin

(2) Gibberellin

(3) Cytokinin

(4) Abscisic acid

Answer (2)

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- Rosette plants (genetic dwarfism) plants exhibit excessive internodal growth when they are treated with gibberellins. This sudden elongation of stem followed by flowering is called **bolting** (Figure 15.13).