



BOTANY

(Question Paper with Answer)

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SECTION-A

101. Movement and accumulation of ions across a membrane against their concentration gradient can be explained by

- (1) Facilitated Diffusion (2) Passive Transport (3) Active Transport (4) Osmosis

Ans. (3)

102. Among 'The Evil Quartet', which one is considered the most important cause driving extinction of species?

- (1) Over exploitation for economic gain (2) Alien species invasions
(3) Co-extinctions (4) Habitat loss and fragmentation

Ans. (4)

103. Identify the pair of heterosporous pteridophytes among the following :

- (1) Selaginella and Salvinia (2) Psilotum and Salvinia
(3) Equisetum and Salvinia (4) Lycopodium and Selaginella

Ans. (1)

104. Frequency of recombination between gene pairs on same chromosome as a measure of the distance between genes to map their position on chromosome, was used for the first time by

- (1) Sutton and Boveri (2) Alfred Sturtevant (3) Henking (4) Thomas Hunt Morgan

Ans. (2)

105. What is the function of tassels in the corn cob?

- (1) To trap pollen grains (2) To disperse pollen grains
(3) To protect seeds (4) To attract insects

Ans. (1)

106. Identify the correct statements :

- A. Detritivores perform fragmentation.
B. The humus is further degraded by some microbes during mineralization.
C. Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching.
D. The detritus food chain begins with living organisms
E. Earthworms break down detritus into smaller particles by a process called catabolism.

Choose the correct answer from the options given below :

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

Ans. (4)



107. Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R**
Assertion A : Late wood has fewer xylary elements with narrow vessels.

Reason R : Cambium is less active in winter.

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

- (1) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.
- (2) **A** is true but **R** is false.
- (3) **A** is false but **R** is true.
- (4) Both **A** and **R** are true and **R** is the correct explanation of **A**.

Ans. (4)

108. The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis

- (1) Pachytene
- (2) Diplotene
- (3) Diakinesis
- (4) Zygotene

Ans. (1)

109. Which of the following stages of meiosis involves division of centromere ?

- (1) Metaphase II
- (2) Anaphase II
- (3) Telophase
- (4) Metaphase I

Ans. (2)

110. During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates-out

- (1) DNA
- (2) Histones
- (3) Polysaccharides
- (4) RNA

Ans. (1)

111. Family Fabaceae differs from Solanaceae and Liliaceae. With respect to the, stamens, pick out the characteristics specific to. family Fabaceae but not found in Solanaceae or Liliaceae.

- (1) Polyadelphous and epipetalous stamens
- (2) Monoadelphous and Monothealous anthers
- (3) Epiphyllous and Dithealous anthers
- (4) Diadelphous and Dithealous anthers

Ans. (4)

112. Large, colourful, fragrant flowers with nectar are seen in :

- (1) bird pollinated plants
- (2) bat pollinated plants
- (3) wind pollinated plants
- (4) insect pollinated plants

Ans. (4)

113. Spraying of which of the following phytohormone on juvenile conifers helps in hastening the maturity period, that leads to early seed production?

- (1) Gibberellic Acid
- (2) Zeatin
- (3) Abscisic Acid
- (4) Indole-3-butyric Acid

Ans. (1)

114. Axile placentation is observed in

- (1) China rose, Beans and Lupin
- (2) Tomato, Dianthus and Peai
- (3) China rose, Petunia and Lemon
- (4) Mustard, Cucumber and Primros

Ans. (3)



115. Among eukaryotes, replication of DNA takes place in -
(1) S phase (2) G₁ phase (3) G₂ Phase (4) M phase
Ans. (1)
116. How many ATP and NADPH₂ are required for the synthesis of one molecule of Glucose during Calvin cycle?
(1) 18 ATP and 12 NADPH₂ (2) 12 ATP and 16 NADPH₂
(3) 18 ATP and 16 NADPH₂ (4) 12 ATP and 12 NADPH₂
Ans. (1)
117. In gene gun method used to introduce alien DNA into host cells, microparticles of metal are used.
(1) Zinc (2) Tungsten or gold (3) Silver (4) Copper
Ans. (2)
118. The thickness of ozone in a column of air in the atmosphere is measured in terms of :
(1) Decibels (2) Decameter (3) Kilobase (4) Dobson Units
Ans. (4)
119. Unequivocal proof that DNA is the genetic material was first proposed by
(1) Alfred Hershey and Martha Chase (2) Avery, Macleoid and McCarthy
(3) Wilkins and Franklin (4) Frederick Griffith
Ans. (1)
120. In the equation $GPP - R = NPP$ GPP is Gross Primary Productivity NPP is Net Primary Productivity R here is
(1) Respiratory quotient (2) Respiratory loss
(3) Reproductive allocation (4) Photosynthetically active radiation
Ans. (2)
121. What is the role of RNA polymerase II in the process of transcription in Eukaryotes ?
(1) Transcription of tRNA, 5 srRNA and snRNA (2) Transcription of precursor of mRNA
(3) Transcription of only snRNAs (4) Transcription of rRNAs (28S, 18s and 5.8S)
Ans. (1)
122. Which micronutrient is required for splitting of water molecule during photosynthesis?
(1) molybdenum (2) magnesium (3) copper (4) manganese
Ans. (4)
123. In angiosperm, the haploid, diploid and triploid structures of fertilized embryo sac sequentially are.
(1) Antipodals, synergids, and primary endosperm nucleus
(2) Synergids, Zygote and primary endosperm nucleus
(3) Synergids, antipodals and polar nuclei
(4) Synergids, Primary endosperm nucleus and zygote
Ans. (2)



124. The phenomenon of pleiotropism refers to
- (1) Presence of two alleles, each of the two genes controlling a single trait
 - (2) A single gene affecting multiple phenotypic expression
 - (3) More than two genes affecting a single character.
 - (4) presence of several alleles of a single gene controlling a single crossover

Ans. (2)

125. Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A : ATP is used at two steps in glycolysis.

Reason R : First ATP is used in converting glucose into glucose-6-phosphate and second ATP is used in conversion of fructosa-6-phosphate into fructose-1-6-diphosphate.

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

- (1) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.
- (2) **A** is true but **R** is false.
- (3) **A** is false but **R** is true.
- (4) Both **A** and **R** are true and **R** is the correct explanation of **A**.

Ans. (4)

126. Cellulose does not form blue colour with Iodine because

- (1) It is a helical molecule.
- (2) It does not contain complex helices and hence cannot hold iodine molecules.
- (3) It breaks down when iodine reacts with it.
- (4) It is a disaccharide

Ans. (2)

127. Which hormone promotes internode/petiole elongation in deep water rice ?

- (1) Kinetinin (2) Ethylene (3) 2, 4-D (4) GA₃

Ans. (2)

128. Expressed Sequence Tags (ESTs) refers to

- (1) All genes that are expressed as proteins.
- (2) All genes whether expressed or unexpressed.
- (3) Certain important expressed genes.
- (4) All genes that are expressed as RNA

Ans. (4)



129. Given below are two statements :

Statement I : The forces generated by transpiration can lift a xylem-sized column of water over 130 meters height.

Statement II : Transpiration cools leaf surfaces sometimes 10 to 15 degrees, by evaporative cooling.

In the light of the above statements, choose the **most appropriate** answer from the options given below

- (1) Both **Statement I** and **Statement II** are incorrect.
- (2) **Statement I** is correct but **Statement II** is incorrect.
- (3) **Statement I** is incorrect but **Statement II** is correct.
- (4) Both **Statement I** and **Statement II** are correct.

Ans. (4)

130. Upon exposure to UV radiation, DNA stained with ethidium bromide will show

- (1) Bright blue colour
- (2) Bright yellow colour
- (3) Bright orange colour
- (4) Bright red colour

Ans. (3)

131. The historic Convention on Biological Diversity, 'The Earth Summit' was held in Rio de Janeiro in the year

- (1) 1992
- (2) 1986
- (3) 2002
- (4) 1985

Ans. (1)

132. The reaction centre in PS II has an absorption maxima at

- (1) 700 nm
- (2) 660 nm
- (3) 780 nm
- (4) 680 nm

Ans. (4)

133. Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A : The first stage of gametophyte in the life cycle of moss is protonema stage.

Reason R : Protonema develops directly from spores produced in capsule.

In the light of the above statements, choose the **most appropriate** answer from the options given below

- (1) Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**.
- (2) **A** is correct but **R** is not correct.
- (3) **A** is not correct but **R** is correct.
- (4) Both **A** and **R** are correct and **R** is the correct explanation of **A**.

Ans. (4)

134. In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as :

- (1) Dedifferentiation
- (2) Development
- (3) Senescence
- (4) Differentiation

Ans. (1)



135. Given below are two statements :

Statement I : Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.

Statement II : Exarch condition is the most common feature of the root system.

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

- (1) Both **Statement I** and **Statement II** are false.
- (2) **Statement I** is correct but **Statement II** is false.
- (3) **Statement I** is incorrect but **Statement II** is true.
- (4) Both **Statement I** and **Statement II** are true.

Ans. (3)

SECTION-B

136. Identify the correct statements :

- A. Lenticels are the lens-shaped openings permitting the exchange of gases.
- B. Bark formed early in the season is called hard bark.
- C. Bark is a technical term that refers to all tissues exterior to vascular cambium.
- D. Bark refers to periderm and secondary phloem.
- E. Phellogen is single-layered in thickness.

Choose the correct answer from the options given below :

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

Ans. (1)

137. Match **List I** with **List II** :

List I

- A. Cohesion
- B. Adhesion
- C. Surface tension
- D. Guttation

List II

- I. More attraction in liquid phase
- II. Mutual attraction among water molecules
- III. Water loss in liquid phase
- IV. Attraction towards polar surfaces

Choose the correct answer from the options given below :

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

Ans. (4)



138. Match **List I** with **List II** :

List I

- A. M Phase
- B. G₂ Phase
- C. Quiescent stage
- D. G₁ Phase

List II

- I. Proteins are synthesized
- II. inactive phase
- III. Interval between mitosis and initiation of DNA replication
- IV. Equational division

Choose the correct answer from the option given below

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

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

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

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

Ans. (2)

139. Which of the following statements are correct about Klinefelter's Syndrome?

- A. This disorder was first described by Langdon Down (1866).
- B. Such an individual has overall masculine development. However, the feminine development is also expressed.
- C. The affected individual is short stature
- D. Physical, psychomotor and mental development is retarded.
- E. Such individuals are sterile.

Choose the correct answer from the options given below :

(1) C and D only

(2) B and E only

(3) A and E only

(4) A and B only

Ans. (2)

140. Given below are two statements :

Statement I : Gause's Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot coexist indefinitely and competitively inferior one will be eliminated eventually

Statement II : In general, carnivores are more adversely affected by competition than herbivores.

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

- (1) Both **Statement I** and **Statement II** are false.
- (2) **Statement I** is correct but **Statement II** is false.
- (3) **Statement I** is incorrect but **Statement II** is true.
- (4) Both **Statement I** and **Statement II** are true.

Ans. (2)

141. How many different proteins does the ribosome consists

(1) 60

(2) 40

(3) 20

(4) 80

Ans. (4)



142. Which of the following combinations is required for chemiosmosis ?

- (1) Membrane, proton pump, proton gradient, NADP synthase
- (2) Proton pump, electron gradient, ATP synthase
- (3) Proton pump, electron gradient, NADP synthase
- (4) Membrane, proton pump, proton gradient, ATP synthase

Ans. (4)

143. Which one of the following statements is **NOT** correct ?

- (1) Algal blooms caused by excess of organic matter in water improve water quality and promote fisheries
- (2) Water hyacinth grows abundantly in eutrophic water bodies and leads to an imbalance in the ecosystem dynamics of the water body
- (3) The amount of some toxic substances of industrial waste water increases in the organisms at successive trophic levels.
- (4) The micro-organisms involved in biodegradation of organic matter in a sewage polluted water body consume a lot of oxygen causing the death of aquatic organisms.

Ans. (1)

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

List I	List II
(Interaction)	(Species A and B)
A. Mutualism	I. +(A), O(B)
B. Commensalism	II. -(A), O(B)
C. Amensalism	III. +(A), -(B)
D. Parasitism	IV. +(A), +(B)

Choose the correct answer from the options given below

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

Ans. (1)

145. Main steps in the formation of Recombinant DNA are given below. Arrange these steps in a correct sequence.

- A. Insertion of recombinant DNA into the host cell.
- B. Cutting of DNA at specific location by restriction enzyme.
- C. Isolation of desired DNA fragment.
- D. Amplification of gene of interest using PCR.

Choose the correct answer from the options given below

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

Ans. (2)



146. Match **List I** with **List II** :

List I

- A. Iron
- B. Zinc
- C. Boron
- D. Molybdenum

List II

- I. Synthesis of zuxin
- II. Component of nitrate reductase
- III. Activator of catalase
- IV. Cell elongation and differentiation

Choose the correct answer from the option given below

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

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

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

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

Ans. (2)

147. Match **List I** with **List II**

List I

- A. Oxidative decarboxylation
- B. glycolysis
- C. Oxidative phosphorylation
- D. Tricarboxylic acid cycle

List II

- I. Citrate synthase
- II. Pyruvate dehydrogenase
- III. Electron transport system
- IV. EMP pathway

Choose the correct answer from the option given below

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

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

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

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

Ans. (3)

148. Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A : In gymnosperms the pollen grains are released from the microsporangium and carried by air currents.

Reason R : Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is not formed.

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

(1) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

(2) **A** is true but **R** is false.

(3) **A** is false but **R** is true.

(4) Both **A** and **R** are true and **R** is the correct explanation of **A**.

Ans. (2)



149. Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R**
Assertion A : A flower is defined as modified shoot wherein the shoot apical meristem changes to floral meristem.

Reason R : Internode of the shoot gets condensed to produce different floral appendages laterally at successive nodes instead of leaves.

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

(1) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

(2) **A** is true but **R** is false.

(3) **A** is false but **R** is true.

(4) Both **A** and **R** are true and **R** is the correct explanation of **A**.

Ans. (4)

150. Melonate inhibits the growth of pathogenic bacteria by inhibiting the activity of

(1) Amylase

(2) Lipase

(3) Dinitrogenase

(4) Succinic dehydrogenase

Ans. (4)