

Botany : Section-A (Q. No. 101 to 135)

- 101 Which hormone promotes internode/petiole elongation in deep water rice?  
 (1) Kinetin (2) Ethylene  
(3) 2, 4-D (4)  $GA_3$
- 102 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
- 103 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
- 104 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
- 105 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
- 106 During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out  
(1) DNA (2) Histones  
(3) Polysaccharides (4) RNA
- 107 How many ATP and  $NADPH_2$  are required for the synthesis of one molecule of Glucose during Calvin cycle?  
 (1) 18 ATP and 12  $NADPH_2$   
(2) 12 ATP and 16  $NADPH_2$   
(3) 18 ATP and 16  $NADPH_2$   
(4) 12 ATP and 12  $NADPH_2$
- 108 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
- 109 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
- 110 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.
- 111 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 winters.  
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**.

112 Among eukaryotes, replication of DNA takes place in -

- (1) S phase (2)  $G_1$  phase  
(3)  $G_2$  phase (4) M phase

113 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

114 Axile placentation is observed in

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

115 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*

116 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

117 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

118 Given below are two statements : One labelled as **Assertion A** and the other 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 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**.

119 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 plant surfaces sometimes 10 to 15 degrees Celsius due to evaporative cooling.

In the light of the above statements, choose the **most appropriate** answer from 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.

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

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

- 121 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
- 122 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.
- 123 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
- 124 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 fructose-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**.
- 125 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
- 126 Identify the **correct** statements :
- A. Detrivores 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
- 127 The reaction centre in PS II has an absorption maxima at
- (1) 700 nm
  - (2) 660 nm
  - (3) 780 nm
  - (4) 680 nm
- 128 In angiosperm, the haploid, diploid and triploid structures of a 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
- 129 Which micronutrient is required for splitting of water molecule during photosynthesis?
- (1) molybdenum
  - (2) magnesium
  - (3) copper
  - (4) manganese
- 130 Which of the following stages of meiosis involves division of centromere?
- (1) Metaphase II
  - (2) Anaphase II
  - (3) Telophase
  - (4) Metaphase I

- 131 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.

- 132 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

- 133 What is the role of RNA polymerase III 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)

- 134 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.

- 135 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  |

- 136 Given below are two statements : One labelled as **Assertion A** and the other labelled as **Reason R** :

**Assertion A** : In gymnosperms pollen grains are released from 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**.
- 137 Which one of the following statements is **NOT** correct?
- (1) Algal blooms caused by excess 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 the organisms at successive trophic levels.
  - (4) The micro-organisms involved in biodegradation of organic matter in sewage polluted water body consume a lot of oxygen causing the death of aquatic organisms.

- 138 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

139 Match List I with List II :

List I	List II
A. M Phase	I. Proteins are synthesized
B. G <sub>2</sub> Phase	II. Inactive phase
C. Quiescent stage	III. Interval between mitosis and initiation of DNA replication
D. G <sub>1</sub> Phase	IV. Equational division

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

140 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

141 Given below are two statements :

**Statement I** : Gause's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot co-exist 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.

142 Match List I with List II :

List I	List II
A. Iron	I. Synthesis of auxin
B. Zinc	II. Component of nitrate reductase
C. Boron	III. Activator of catalase
D. Molybdenum	IV. Cell elongation and differentiation

Choose the correct answer from the options given below :

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

143 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 statured.
- D. Physical, psychomotor and mental development is retarded.
- E. Such individuals are sterile.

Choose the correct answer from the options given below :

- C and D only   
  B and E only  
 A and E only   
  A and B only

144 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

145 How many different proteins does the ribosome consist of?

- (1) 60 (2) 40  
(3) 20 (4) 80

146 Melonate inhibits the growth of pathogenic bacteria by inhibiting the activity of

- (1) Amylase  
(2) Lipase  
(3) Dinitrogenase  
(4) Succinic dehydrogenase

147 Match List I with List II :

- | List I             | List II                                     |
|--------------------|---|
| A. Cohesion        | I. More attraction in liquid phase          |
| B. Adhesion        | II. Mutual attraction among water molecules |
| C. Surface tension | III. Water loss in liquid phase             |
| D. Guttation       | 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

148 Match List I with List II :

- | List I                       | List II                        |
|------------------------------|--------------------------------|
| A. Oxidative decarboxylation | I. Citrate synthase            |
| B. Glycolysis                | II. Pyruvate dehydrogenase     |
| C. Oxidative phosphorylation | III. Electron transport system |
| D. Tricarboxylic acid cycle  | IV. EMP pathway                |

Choose the correct answer from the options 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

149 Given below are two statements : One labelled as **Assertion A** and the other 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 correct explanation of **A**.

150 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