

# BOTANY

## SECTION-A

101. Which one of the following statement is **not true** regarding gel electrophoresis technique?
- (1) The presence of chromogenic substrate gives blue coloured DNA bands on the gel.
  - (2) Bright orange coloured bands of DNA can be observed in the gel when exposed to UV light.
  - (3) The process of extraction of separated DNA strands from gel is called elution.
  - (4) The separated DNA fragments are stained by using ethidium bromide.

**Answer (1)**

102. Given below are two statements :

**Statement I :**

Mendel studied seven pairs of contrasting traits in pea plants and proposed the Laws of Inheritance.

**Statement II :**

Seven characters examined by Mendel in his experiment on pea plants were seed shape and colour, flower colour, pod shape and colour, flower position and stem height.

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

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

**Answer (3)**

103. Which of the following is **incorrectly** matched?

- (1) *Porphyra* – Floridian Starch
- (2) *Volvox* – Starch
- (3) *Ectocarpus* – Fucoxanthin
- (4) *Ulothrix* – Mannitol

**Answer (4)**

104. XO type of sex determination can be found in :

- (1) Grasshoppers
- (2) Monkeys
- (3) *Drosophila*
- (4) Birds

**Answer (1)**

105. The appearance of recombination nodules on homologous chromosomes during meiosis characterizes :

- (1) Sites at which crossing over occurs
- (2) Terminalization
- (3) Synaptonemal complex
- (4) Bivalent

**Answer (1)**

106. Which of the following is **not** a method of *ex situ* conservation?

- (1) Micropropagation
- (2) Cryopreservation
- (3) *In vitro* fertilization
- (4) National Parks

**Answer (4)**

107. Identify the **incorrect** statement related to Pollination :

- (1) Flowers produce foul odours to attract flies and beetles to get pollinated
- (2) Moths and butterflies are the most dominant pollinating agents among insects
- (3) Pollination by water is quite rare in flowering plants
- (4) Pollination by wind is more common amongst abiotic pollination

**Answer (2)**

108. Given below are two statements :

**Statement I :**

The primary  $\text{CO}_2$  acceptor in  $\text{C}_4$  plants is phosphoenolpyruvate and is found in the mesophyll cells.

**Statement II :**

Mesophyll cells of  $\text{C}_4$  plants lack RuBisCo enzyme. In the light of the above statements, choose the **correct** answer from the options given below:

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

**Answer (3)**

109. In old trees the greater part of secondary xylem is dark brown and resistant to insect attack due to :

- (a) secretion of secondary metabolites and their deposition in the lumen of vessels.
- (b) deposition of organic compounds like tannins and resins in the central layers of stem.
- (c) deposition of suberin and aromatic substances in the outer layer of stem.
- (d) deposition of tannins, gum, resin and aromatic substances in the peripheral layers of stem.
- (e) presence of parenchyma cells, functionally active xylem elements and essential oils.

Choose the **correct** answer from the options given below:

- (1) (d) and (e) Only
- (2) (b) and (d) Only
- (3) (a) and (b) Only
- (4) (c) and (d) Only

**Answer (3)**

110. Which one of the following produces nitrogen fixing nodules on the roots of *Alnus*?

- (1) *Rhodospirillum*
- (2) *Beijerinckia*
- (3) *Rhizobium*
- (4) *Frankia*

**Answer (4)**

111. Given below are two statements:

**Statement I:** Decomposition is a process in which the detritus is degraded into simpler substances by microbes.

**Statement II:** Decomposition is faster if the detritus is rich in lignin and chitin.

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

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

**Answer (1)**

112. Habitat loss and fragmentation, over exploitation, alien species invasion and co-extinction are causes for:

- (1) Biodiversity loss
- (2) Natality
- (3) Population explosion
- (4) Competition

**Answer (1)**

113. Hydrocolloid carrageen is obtained from:

- (1) Rhodophyceae only
- (2) Phaeophyceae only
- (3) Chlorophyceae and Phaeophyceae
- (4) Phaeophyceae and Rhodophyceae

**Answer (1)**

114. "Girdling Experiment" was performed by Plant Physiologists to identify the plant tissue through which:

- (1) for both water and food transportation
- (2) osmosis is observed
- (3) water is transported
- (4) food is transported

**Answer (4)**

115. The flowers are Zygomorphic in:

- (a) Mustard
- (b) Gulmohar
- (c) *Cassia*
- (d) *Datura*
- (e) Chilly

Choose the **correct answer** from the options given below:

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

**Answer (4)**

116. Which one of the following is **not** true regarding the release of energy during ATP synthesis through chemiosmosis? It involves:
- (1) Movement of protons across the membrane to the stroma
  - (2) Reduction of NADP to NADPH<sub>2</sub> on the stroma side of the membrane
  - (3) Breakdown of proton gradient
  - (4) Breakdown of electron gradient

**Answer (4)**

117. The device which can remove particulate matter present in the exhaust from a thermal power plant is :
- (1) Electrostatic Precipitator
  - (2) Catalytic Converter
  - (3) STP
  - (4) Incinerator

**Answer (1)**

118. Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

**Assertion (A) :**

Polymerase chain reaction is used in DNA amplification.

**Reason (R) :**

The ampicillin resistant gene is used as a selectable marker to check transformation

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

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

**Answer (4)**

119. Which one of the following plants does **not** show plasticity?
- (1) Buttercup
  - (2) Maize
  - (3) Cotton
  - (4) Coriander

**Answer (2)**

120. The process of translation of mRNA to proteins begins as soon as :
- (1) Both the subunits join together to bind with mRNA
  - (2) The tRNA is activated and the larger subunit of ribosome encounters mRNA
  - (3) The small subunit of ribosome encounters mRNA
  - (4) The larger subunit of ribosome encounters mRNA

**Answer (3)**

121. Read the following statements and choose the set of **correct** statements :

- (a) Euchromatin is loosely packed chromatin
- (b) Heterochromatin is transcriptionally active
- (c) Histone octamer is wrapped by negatively charged DNA in nucleosome
- (d) Histones are rich in lysine and arginine
- (e) A typical nucleosome contains 400 bp of DNA helix

Choose the correct answer from the options given below :

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

**Answer (4)**

122. Read the following statements about the vascular bundles :

- (a) In roots, xylem and phloem in a vascular bundle are arranged in an alternate manner along the different radii.
- (b) Conjoint closed vascular bundles do not possess cambium
- (c) In open vascular bundles, cambium is present in between xylem and phloem
- (d) The vascular bundles of dicotyledonous stem possess endarch protoxylem
- (e) In monocotyledonous root, usually there are more than six xylem bundles present

Choose the correct answer from the options given below :

- (1) (a), (b), (c) and (d) Only
- (2) (a), (c), (d) and (e) Only
- (3) (a), (b) and (d) Only
- (4) (b), (c), (d) and (e) Only

**Answer (NA)**

123. Exoskeleton of arthropods is composed of :

- (1) Chitin
- (2) Glucosamine
- (3) Cutin
- (4) Cellulose

**Answer (1)**

124. What is the net gain of ATP when each molecule of glucose is converted to two molecules of pyruvic acid?

- (1) Two
- (2) Eight
- (3) Four
- (4) Six

**Answer (1)**

125. Which of the following is **not** observed during apoplastic pathway ?

- (1) The movement is aided by cytoplasmic streaming
- (2) Apoplast is continuous and does not provide any barrier to water movement.
- (3) Movement of water occurs through intercellular spaces and wall of the cells.
- (4) The movement does not involve crossing of cell membrane

**Answer (1)**

126. Which one of the following plants shows vexillary aestivation and diadelphous stamens?

- (1) *Allium cepa*
- (2) *Solanum nigrum*
- (3) *Colchicum autumnale*
- (4) *Pisum sativum*

**Answer (4)**

127. DNA polymorphism forms the basis of

- (1) Both genetic mapping and DNA finger printing
- (2) Translation
- (3) Genetic mapping
- (4) DNA finger printing

**Answer (1)**

128. What amount of energy is released from glucose during lactic acid fermentation?

- (1) About 10%
- (2) Less than 7%
- (3) Approximately 15%
- (4) More than 18%

**Answer (2)**

129. Identify the **correct** set of statements :

- (a) The leaflets are modified into pointed hard thorns in *Citrus* and *Bougainvillea*
- (b) Axillary buds form slender and spirally coiled tendrils in cucumber and pumpkin
- (c) Stem is flattened and fleshy in *Opuntia* and modified to perform the function of leaves
- (d) *Rhizophora* shows vertically upward growing roots that help to get oxygen for respiration
- (e) Subaerially growing stems in grasses and strawberry help in vegetative propagation

Choose the **correct answer** from the options given below :

- (1) (b), (c), (d) and (e) Only
- (2) (a), (b), (d) and (e) Only
- (3) (b) and (c) Only
- (4) (a) and (d) Only

**Answer (1)**

130. Which one of the following statements cannot be connected to Predation?

- (1) Both the interacting species are negatively impacted
- (2) It is necessitated by nature of maintain the ecological balance
- (3) It helps in maintaining species diversity in a community
- (4) It might lead to extinction of a species

**Answer (1)**

131. Given below are two statements :

**Statement I :**

Cleistogamous flowers are invariably autogamous

**Statement II :**

Cleistogamy is disadvantageous as there is no chance for cross pollination

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

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

**Answer (3)**

132. Production of Cucumber has increased manifold in recent years. Application of which of the following phytohormones has resulted in this increased yield as the hormone is known to produce female flowers in the plants :

- (1) Ethylene
- (2) Cytokinin
- (3) ABA
- (4) Gibberellin

**Answer (1)**

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

	<b>List -I</b>		<b>List -II</b>
(a)	Manganese	(i)	Activates the enzyme catalase
(b)	Magnesium	(ii)	Required for pollen germination
(c)	Boron	(iii)	Activates enzymes of respiration
(d)	Iron	(iv)	Function in splitting of water during photosynthesis

Choose the **correct answer** from the options given below :

- (1) (a)-(vi), (b)-(i), (c)-(ii), (d)-(iii)
- (2) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
- (3) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
- (4) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

**Answer (4)**

134. Which one of the following never occurs during mitotic cell division?

- (1) Pairing of homologous chromosomes
- (2) Coiling and condensation of the chromatids
- (3) Spindle fibres attach to kinetochores of chromosomes
- (4) Movement of centrioles towards opposite poles

**Answer (1)**

135. The gaseous plant growth regulator is used in plants to :
- (1) help overcome apical dominance
  - (2) kill dicotyledonous weeds in the fields
  - (3) speed up the malting process
  - (4) promote root growth and root hair formation to increase the absorption surface

**Answer (4)**

### SECTION-B

136. Match the plant with the kind of life cycle it exhibits:

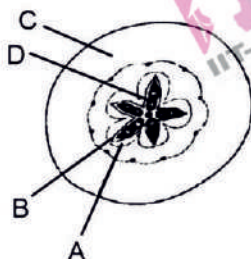
List-I	List-II
(a) <i>Spirogyra</i>	(i) Dominant diploid sporophyte vascular plant, with highly reduced male or female gametophyte
(b) Fern	(ii) Dominant haploid free-living gametophyte
(c) <i>Funaria</i>	(iii) Dominant diploid sporophyte alternating with reduced gametophyte called prothallus
(d) <i>Cycas</i>	(iv) Dominant haploid leafy gametophyte alternating with partially dependent multicellular sporophyte

Choose the **correct answer** from the options given below :

- (1) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
- (2) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
- (3) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
- (4) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

**Answer (4)**

137. Which part of the fruit, labelled in the given figure makes it a false fruit?



- (1) C → Thalamus
- (2) D → Seed
- (3) A → Mesocarp
- (4) B → Endocarp

**Answer (1)**

138. Which one of the following will accelerate phosphorus cycle?

- (1) Weathering of rocks
- (2) Rain fall and storms
- (3) Burning of fossil fuels
- (4) Volcanic activity

**Answer (1)**



139. Match List-I with List-II.

List-I	List-II
(a) Metacentric chromosome	(i) Centromere situated close to the end forming one extremely short and one very long arms
(b) Acrocentric chromosome	(ii) Centromere at the terminal end
(c) Submetacentric	(iii) Centromere in the middle forming two equal arms of chromosomes
(d) Telocentric chromosome	(iv) Centromere slightly away from the middle forming one shorter arm and one longer arm

Choose the **correct answer** from the options given below :

- (1) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
- (2) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
- (3) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
- (4) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

**Answer (3)**

140. The anatomy of springwood shown some peculiar features. Identify the **correct** set of statements about springwood.

- (a) It is also called as the earlywood
- (b) In spring season cambium produces xylem elements with narrow vessels
- (c) It is lighter in colour
- (d) The springwood along with autumnwood shown alternate concentric rings forming annual rings
- (e) It has lower density

Choose the **correct answer** from the options given below :

- (1) (a), (b) and (d) Only
- (2) (c), (d) and (e) Only
- (3) (a), (b), (d) and (e) Only
- (4) (a), (c), (d) and (e) Only

**Answer (4)**

141. Given below are two statements : one is labelled as

**Assertion (A)** and the other is labelled as **Reason (R)**.

**Assertion (A)** : Mendel's law of Independent assortment does not hold good for the genes that are located closely on the same chromosome.

**Reason (R)** : Closely located genes assort independently.

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

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

**Answer (1)**

142. Read the following statements on lipids and find out correct set of statements:

- (a) Leithin found in the plasma membrane is a glycolipid
- (b) Saturated fatty acids possess one or more  $c = c$  bonds
- (c) Gingely oil has lower melting point, hence remains as oil in winter
- (d) Lipids are generally insoluble in water but soluble in some organic solvents
- (e) When fatty acid is esterified with glycerol, monoglycerides are formed

Choose the correct answer from the option given below:

- (1) (c), (d) and (e) only
- (2) (a), (b) and (d) only
- (3) (a), (b) and (c) only
- (4) (a), (d) and (e) only

**Answer (1)**

143. What is the role of large bundle sheath cells found around the vascular bundles in  $C_4$  plants?

- (1) To enable the plant to tolerate high temperature
- (2) To protect the vascular tissue from high light intensity
- (3) To provide the site for photorespiratory
- (4) To increase the number of chloroplast for the operation of Calvin cycle

**Answer (4)**

144. In the following palindromic base sequences of DNA, which one can be cut easily by particular restriction enzyme?

- (1) 5'CTCAGT3'; 3'GAGTCA5'
- (2) 5'GTATTC3'; 3'CATAAG5'
- (3) 5'GATACT3'; 3'CTATGA5'
- (4) 5'GAATTC3'; 3'CTTAAG5'

**Answer (4)**

145. The entire fleet of buses in Delhi were converted to CNG from diesel. In reference to this, which one of the following statements is false?

- (1) It is cheaper than diesel
- (2) It can not be adulterated like diesel
- (3) CNG burns more efficiently than diesel
- (4) The same diesel engine is used in CNG buses making the cost conversion low

**Answer (4)**

146. Addition of more solutes in a given solution will :

- (1) make its water potential zero
- (2) not affect the water potential at all
- (3) raise its water potential
- (4) lower its water potential

**Answer (4)**

147. Transposons can be used during which one of the following ?

- (1) Autoradiography
- (2) Gene sequencing
- (3) Polymerase Chain Reaction
- (4) Gene Silencing

**Answer (3)**

148. While explaining interspecific interaction of population, (+) sign is assigned for beneficial interaction, (-) sign is assigned for detrimental interaction and (0) for neutral interaction. Which of the following interactions can be assigned (+) for one species and (-) for another species involved in the interaction ?

- (1) Commensalism
- (2) Competition
- (3) Predation
- (4) Amensalism

**Answer (3)**

149. If a geneticist uses the blind approach for sequencing the whole genome of an organism, followed by assignment of function to different segments, the methodology adopted by him is called as :

- (1) Expressed sequence tags
- (2) Bioinformatics
- (3) Sequence annotation
- (4) Gene mapping

**Answer (3)**

150. Which of the following occurs due to the presence of autosome linked dominant trait ?

- (1) Haemophilia
- (2) Thalassemia
- (3) Sickle cell anaemia
- (4) Myotonic dystrophy

**Answer (4)**

## ZOOLOGY

### SECTION-A

151. Natural selection where more individuals acquire specific character value other than the mean character value, leads to

- |                        |                        |
|------------------------|------------------------|
| (1) Disruptive change  | (2) Random change      |
| (3) Stabilising change | (4) Directional change |

**Answer (4)**

152. Given below are two statements :

Statement I : Mycoplasma can pass through less than 1 micron filter size.

Statement II : Mycoplasma are bacteria with cell wall.

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

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

**Answer (1)**

153. A dehydration reaction links two glucose molecules to product maltose. If the formula for glucose is  $C_6H_{12}O_6$  then what is the formula of maltose?

- |                          |                          |
|--------------------------|--------------------------|
| (1) $C_{12}H_{22}O_{11}$ | (2) $C_{12}H_{24}O_{11}$ |
| (3) $C_{12}H_{20}O_{10}$ | (4) $C_{12}H_{24}O_{12}$ |

**Answer (1)**

154. Which of the following statements with respect to Endoplasmic Reticulum is incorrect?

- (1) In prokaryotes only RER are present
- (2) SER are the sites for lipid synthesis
- (3) RER has ribosomes attached to ER
- (4) SER is devoid of ribosomes

**Answer (1)**

155. Tegmina in cockroach, arises from

- (1) Metathorax
- (2) Prothorax and Mesothorax
- (3) Prothorax
- (4) Mesothorax

**Answer (4)**

156. If the length of a DNA molecule is 1.1 metres, what will be the approximate number of base pairs?

- (1)  $3.3 \times 10^6$  bp (2)  $6.6 \times 10^6$  bp  
(3)  $3.3 \times 10^9$  bp (4)  $6.6 \times 10^9$  bp

**Answer (3)**

157. Identify the asexual reproductive structure associated with *Penicillium* :

- (1) Gemmules (2) Buds  
(3) Zoospores (4) Conidia

**Answer (4)**

158. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

**Assertion (A)** : All vertebrates are chordates but all chordates are not vertebrates.

**Reason (R)** : Notochord is replaced by vertebral column in the adult vertebrates.

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

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

**Answer (3)**

159. Breeding crops with higher levels of vitamins and minerals or higher proteins and healthier fats is called :

- (1) Bio-fortification (2) Bio-accumulation  
(3) Bio-magnification (4) Bio-remediation

**Answer (1)**

160. Under normal physiological conditions in human being every 100 ml of oxygenated blood can deliver \_\_\_\_\_ ml of  $O_2$  to the tissues.

- (1) 4 ml (2) 10 ml  
(3) 2 ml (4) 5 ml

**Answer (4)**

161. In which of the following animals, digestive tract has additional chambers like crop and gizzard?

- (1) *Catla*, *Columba*, *Crocodilus* (2) *Pavo*, *Psittacula*, *Corvus*  
(3) *Corvus*, *Columba*, *Chameleon* (4) *Bufo*, *Balaenoptera*, *Bangarus*

**Answer (2)**

162. Which of the following functions is **not** performed by secretions from salivary glands?

- (1) Lubrication of oral cavity  
(2) Digestion of disaccharides  
(3) Control bacterial population in mouth  
(4) Digestion of complex carbohydrates

**Answer (2)**

163. Nitrogenous waste is excreted in the form of pellet or paste by :

- (1) *Hippocampus*
- (2) *Pavo*
- (3) *Ornithorhynchus*
- (4) *Salamandra*

**Answer (2)**

164. In an *E. Coli* strain *i* gene gets mutated and its product can not bind the inducer molecule. If growth medium is provided with lactose, what will be the outcome?

- (1) *z, y, a* genes will not be translated
- (2) RNA polymerase will bind the promoter region
- (3) Only *z* gene will get transcribed
- (4) *z, y, a* genes will be transcribed

**Answer (1)**

165. Which of the following is present between the adjacent bones of the vertebral column?

- (1) Areolar tissue
- (2) Smooth muscle
- (3) Intercalated discs
- (4) Cartilage

**Answer (4)**

166. Given below are two statements :

**Statement I :**

Fatty acids and glycerols cannot be absorbed into the blood.

**Statement II :**

Specialized lymphatic capillaries called lacteals carry chylomicrons into lymphatic vessels and ultimately into the blood.

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

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

**Answer (3)**

167. Select the **incorrect** statement with reference to mitosis:

- (1) Chromosomes decondense at telophase
- (2) Splitting of centromere occurs at anaphase
- (3) All the chromosomes lie at the equator at metaphase
- (4) Spindle fibres attach to centromere of chromosomes

**Answer (4)**

168. Given below are two statements:

**Statement I :**

The release of sperms into the seminiferous tubules is called spermiation.

**Statement II :**

Spermiogenesis is the process of formation of sperms from spermatogonia.

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

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

**Answer (1)**

169. Given below are two statements :

**Statement I :**

The coagulum is formed of network of threads called thrombins.

**Statement II :**

Spleen is the graveyard of erythrocytes.

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

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

**Answer (2)**

170. Identify the microorganism which is responsible for the production of an immunosuppressive molecule cyclosporin A :

- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| (1) <i>Aspergillus niger</i>      | (2) <i>Streptococcus cerevisiae</i> |
| (3) <i>Trichoderma polysporum</i> | (4) <i>Clostridium butylicum</i>    |

**Answer (3)**

171. Which of the following statements are true for spermatogenesis but do not hold true for Oogenesis?

- (a) It results in the formation of haploid gametes
- (b) Differentiation of gamete occurs after the completion of meiosis
- (c) Meiosis occurs continuously in a mitotically dividing stem cell population
- (d) It is controlled by the Luteinising hormone (LH) and Follicle Stimulating Hormone (FSH) secreted by the anterior pituitary
- (e) It is initiated at puberty

Choose the most appropriate answer from the options given below:

- |                           |                           |
|---------------------------|---------------------------|
| (1) (b), (d) and (e) only | (2) (b), (c) and (e) only |
| (3) (c) and (e) only      | (4) (b) and (c) only      |

**Answer (2)**

172. *In-situ* conservation refers to:

- (1) Conserve only endangered species
- (2) Conserve only extinct species
- (3) Protect and conserve the whole ecosystem
- (4) Conserve only high-risk species

**Answer (3)**

173. Lippe's loop is a type of contraceptive used as:

- |                       |                          |
|-----------------------|--------------------------|
| (1) Non-Medicated IUD | (2) Copper releasing IUD |
| (3) Cervical barrier  | (4) Vault barrier        |

**Answer (1)**

174. Which of the following is a correct match for disease and its symptoms?

- (1) Myasthenia gravis – Genetic disorder resulting in weakening and paralysis of skeletal muscle
- (2) Muscular dystrophy – An auto immune disorder causing progressive degeneration of skeletal muscle
- (3) Arthritis – Inflamed joints
- (4) Tetany – High  $Ca^{2+}$  level causing rapid spasms.

**Answer (3)**

175. Which of the following is not the function of conducting part of respiratory system?

- (1) Temperature of inhaled air is brought to body temperature
- (2) Provides surface for diffusion of  $O_2$  and  $CO_2$
- (3) It clears inhaled air from foreign particles
- (4) Inhaled air is humidified

**Answer (2)**

176. Regarding Meiosis, which of the statements is **incorrect**?

- (1) Pairing of homologous chromosomes and recombination occurs in Meiosis-I
- (2) Four haploid cells are formed at the end of Meiosis-II
- (3) There are two stages in Meiosis, Meiosis-I and II
- (4) DNA replication occurs in S phase of Meiosis-II

**Answer (4)**

177. Detritivores breakdown detritus into smaller particles. This process is called:

- |                  |                   |
|------------------|-------------------|
| (1) Humification | (2) Decomposition |
| (3) Catabolism   | (4) Fragmentation |

**Answer (4)**

178. Which of the following is **not** a connective tissue?

- |               |                    |
|---------------|--------------------|
| (1) Cartilage | (2) Neuroglia      |
| (3) Blood     | (4) Adipose tissue |

**Answer (2)**



179. In the taxonomic categories which hierarchical arrangement in ascending order is **correct** in case of animals?

- (1) Kingdom, Order, Class, Phylum, Family, Genus, Species
- (2) Kingdom, Order, Phylum, Class, Family, Genus, Species
- (3) Kingdom, Phylum, Class, Order, Family, Genus, Species
- (4) Kingdom, Class, Phylum, Family, Order, Genus, Species

**Answer (3\*)**

\* Language of question is wrongly framed. The word ascending should be replaced by descending

180. Given Below are two statements:

**Statement I:**

Restriction endonucleases recognise specific sequence to cut DNA known as palindromic nucleotide sequence.

**Statement II:**

Restriction endonucleases cut the DNA strand a little away from the centre of the palindromic site.

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

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

**Answer (3)**

181. In gene therapy of Adenosine Deaminase (ADA) deficiency, the patient requires periodic infusion of genetically engineered lymphocytes because :

- (1) Lymphocytes from patient's blood are grown in culture, outside the body.
- (2) Genetically engineered lymphocytes are not immortal cells.
- (3) Retroviral vector is introduced into these lymphocytes.
- (4) Gene isolated from marrow cells producing ADA is introduced into cells at embryonic stages

**Answer (2)**

182. Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

**Assertion (A):**

Osteoporosis is characterised by decreased bone mass and increased chance of fractures.

**Reason (R):**

Common cause of osteoporosis is increased levels of estrogen.

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

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

**Answer (1)**

183. At which stage of the life the oogenesis process is initiated?

- (1) Birth (2) Adult  
(3) Puberty (4) Embryonic development stage

**Answer (4)**

184. If '8' Drosophila in a laboratory population of '80' died during a week, the death rate in the population is \_\_\_\_\_ individuals per Drosophila per week.

- (1) 1.0  
(2) zero  
(3) 0.1  
(4) 10

**Answer (3)**

185. Given below are two statements:

**Statement I:**

Autoimmune disorder is a condition where body defense mechanism recognizes its own cells as foreign bodies.

**Statement II:**

Rheumatoid arthritis is a condition where body does not attack self cells.

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

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

**Answer (1)**

### SECTION-B

186. The recombination frequency between the genes a & c is 5%, b & c is 15%, b & d is 9%, a & b is 20%, c & d is 24% and a & d is 29%. What will be the sequence of these genes on a linear chromosome?

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

**Answer (2)**

187. Match List-I with List-II

	List-I (Biological Molecules)		List-II (Biological functions)
(a)	Glycogen	(i)	Hormone
(b)	Globuline	(ii)	Biocatalyst

(c)	Steroids	(iii)	Antibody
(d)	Thrombin	(iv)	Storage product

Choose the **correct answer** from the options given below:

- (1) (a) - (ii), (b) - (iv), (c) - (iii), (d) - (i)                      (2) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)  
 (3) (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)                      (4) (a) - (iv), (b) - (ii), (c) - (i), (d) - (iii)

**Answer (2)**

188. Which of the following are **not** the effects of Parathyroid hormone?

- (a) Stimulates the process of bone resorption  
 (b) Decreases  $\text{Ca}^{2+}$  level in blood  
 (c) Reabsorption of  $\text{Ca}^{2+}$  by renal tubules  
 (d) Decreases the absorption of  $\text{Ca}^{2+}$  from digested food  
 (e) Increases metabolism of carbohydrates

Choose the **most appropriate** answer from the options given below:

- (1) (a) and (e) only                      (2) (b) and (c) only  
 (3) (a) and (c) only                      (4) (b), (d) and (e) only

**Answer (4)**

189. Which of the following is **not** a desirable feature of a cloning vector?

- (1) Presence of single restriction enzyme site  
 (2) Presence of two or more recognition sites  
 (3) Presence of origin of replication  
 (4) Presence of a marker gene

**Answer (2)**

190. Match **List-I** with **List-II** with respect to methods of Contraception and their respective actions.

	List-I		List-II
(a)	Diaphragms	(i)	Inhibit ovulation and Implantation
(b)	Contraceptive Pills	(ii)	Increase phagocytosis of sperm within Uterus
(c)	Intra Uterine Devices	(iii)	Absence of Menstrual cycle and ovulation following parturition
(d)	Lactational Amenorrhea	(iv)	They cover the cervix blocking the entry of sperms

Choose the **correct answer** from the options given below:

- (1) (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)  
 (2) (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)  
 (3) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)  
 (4) (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)

**Answer (4)**

191. If a colour blind female marries a man whose mother was also colour blind, what are the chances of her progeny having colour blindness?

- (1) 75% (2) 100%  
(3) 25% (4) 50%

**Answer (2)**

192. Which of the following statements is **not** true?

- (1) Homology indicates common ancestry  
(2) Flippers penguins and dolphins are a pair of homologous organs  
(3) Analogous structures are a result of convergent evolution  
(4) Sweet potato and potato is an example of analogy

**Answer (2)**

193. Which of the following is a **correct** statement?

- (1) Slime moulds are saprophytic organisms classified under Kingdom Monera.  
(2) Mycoplasma have DNA, Ribosome and cell wall.  
(3) Cyanobacteria are a group of autotrophic organisms classified under kingdom Monera.  
(4) Bacteria are exclusively heterotrophic organisms.

**Answer (?)**

194. Select the **incorrect** statement with respect to acquired immunity.

- (1) Anamnestic response is due to memory of first encounter.  
(2) Acquired immunity is non-specific type of defense present at the time of birth.  
(3) Primary response is produced when our body encounters a pathogen for the first time.  
(4) Anamnestic response is elicited on subsequent encounters with the same pathogen.

**Answer (2)**

195. Match List-I with List-II

	List-I		List-II
(a)	Bronchioles	(i)	Dense Regular Connective Tissue
(b)	Goblet Cell	(ii)	Loose Connective Tissue
(c)	Tendons	(iii)	Glandular Tissue
(d)	Adipose Tissue	(iv)	Ciliated Epithelium

Choose the **correct answer** from the options given below:

- (1) (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii) (2) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)  
(3) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii) (4) (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)

**Answer (3)**

196. Statements related to human Insulin are given below.

Which statement(s) is/are **correct** about genetically engineered Insulin?

- (a) Pro-hormone insulin contain extra stretch of C-peptide
- (b) A-peptide and B-peptide chains of insulin were produced separately in *E.coli*, extracted and combined by creating disulphide bond between them.
- (c) Insulin used for treating Diabetes was extracted from Cattles and Pigs.
- (d) Pro-hormone Insulin needs to be processed for converting into a mature and functional hormone.
- (e) Some patients develop allergic reactions to the foreign insulin.

Choose **the most appropriate** answer from the options given below:

- (1) (c) and (d) only
- (2) (c), (d) and (e) only
- (3) (a), (b) and (d) only
- (4) (b) only

**Answer (4)**

197. Given below are two statements:

**Statements I :**

In a scrubber the exhaust from the thermal plant is passed through the electric wires to charge the dust particles.

**Statement II :**

Particulate matter (PM 2.5) can not be removed by scrubber but can be removed by an electrostatic precipitator.

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

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

**Answer (2)**

198. Ten *E.coli* cells with  $^{15}\text{N}$  - dsDNA are incubated in medium containing  $^{14}\text{N}$  nucleotide. After 60 minutes, how many *E.coli* cells will have DNA totally free from  $^{15}\text{N}$ ?

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

**Answer (1)**

199. Select the **incorrect** statement regarding synapses :

- (1) Chemical synapses use neurotransmitters
- (2) Impulse transmission across a chemical synapse is always faster than that across an electrical synapse.
- (3) The membranes of presynaptic and postsynaptic neurons are in close proximity in an electrical synapse.
- (4) Electrical current can flow directly from one neuron into the other across the electrical synapse.

**Answer (2)**

200. Which one of the following statements is **correct**?

- (1) Blood moves freely from atrium to the ventricle during joint diastole.
- (2) Increased ventricular pressure causes closing of the semilunar valves.
- (3) The atrio-ventricular node (AVN) generates an action potential to stimulate atrial contraction
- (4) The tricuspid and the bicuspid valves open due to the pressure exerted by the simultaneous contraction of the atria

**Answer (1)**

