competitorspoint.com

NEET (UG) 2016 Phase II — Biology (Botany + Zoology)

Exam date: 24 July 2016 (Phase II) • Test Booklet Codes: AA / PP / WW (common question order) • Questions 91–180 (90 questions, all compulsory) • +4 / –1

Questions as they appeared in NEET (UG) 2016 Phase II (24 July 2016) conducted by CBSE. Answers verified by competitorspoint.com. Explanations by competitorspoint.com.

Biology — Botany (Q. 91–135)

91. Which one of the following is wrong for fungi ?
(1) They are eukaryotic
(2) All fungi possess a purely cellulosic cell wall
(3) They are heterotrophic
(4) They are both unicellular and multicellular

92. Methanogens belong to
(1) eubacteria **(2)** archaebacteria
(3) dinoflagellates **(4)** slime moulds

93. Select the wrong statement.
(1) The walls of diatoms are easily destructible
(2) 'Diatomaceous earth' is formed by the cell walls of diatoms
(3) Diatoms are chief producers in the oceans
(4) Diatoms are microscopic and float passively in water

94. The label of a herbarium sheet does not carry information on
(1) date of collection **(2)** name of collector
(3) local names **(4)** height of the plant

95. Conifers are adapted to tolerate extreme environmental conditions because of
(1) broad hardy leaves **(2)** superficial stomata
(3) thick cuticle **(4)** the presence of vessels

96. Which one of the following statements is wrong ?
(1) Algae increase the level of dissolved oxygen in the immediate environment
(2) Algin is obtained from red algae and carrageenan from brown algae
(3) Agar-agar is obtained from Gelidium and Gracilaria
(4) Laminaria and Sargassum are used as food

97. The term ‘polyadelphous’ is related to
(1) gynoecium **(2)** androecium
(3) corolla **(4)** calyx

98. How many plants among Indigofera, Sesbania, Salvia, Allium, Aloe, mustard, groundnut, radish, gram and turnip have stamens with different lengths in their flowers ?
(1) Three **(2)** Four
(3) Five **(4)** Six

99. Radial symmetry is found in the flowers of
(1) Brassica **(2)** Trifolium
(3) Pisum **(4)** Cassia

100. Free-central placentation is found in
(1) Dianthus **(2)** Argemone
(3) Brassica **(4)** Citrus

101. Cortex is the region found between
(1) epidermis and stele
(2) pericycle and endodermis
(3) endodermis and pith
(4) endodermis and vascular bundle

102. The balloon-shaped structures called tyloses
(1) originate in the lumen of vessels
(2) characterise the sapwood
(3) are extensions of xylem parenchyma cells into vessels
(4) are linked to the ascent of sap through xylem vessels

103. A non-proteinaceous enzyme is
(1) lysozyme **(2)** ribozyme
(3) ligase **(4)** deoxyribonuclease

104. Select the mismatch.
(1) Gas vacuoles — Green bacteria
(2) Large central vacuoles — Animal cells
(3) Protists — Eukaryotes
(4) Methanogens — Prokaryotes

105. Select the wrong statement.
(1) Bacterial cell wall is made up of peptidoglycan
(2) Pili and fimbriae are mainly involved in motility of bacterial cells
(3) Cyanobacteria lack flagellated cells
(4) Mycoplasma is a wall-less microorganism

106. A cell organelle containing hydrolytic enzyme is
(1) lysosome **(2)** microsome
(3) ribosome **(4)** mesosome

107. During cell growth, DNA synthesis takes place in
(1) S-phase **(2)** G1-phase
(3) G2-phase **(4)** M-phase

108. Which of the following biomolecules is common to respiration-mediated break down of fats, carbohydrates and proteins ?

(1) Glucose-6-phosphate **(2)** Fructose 1, 6-bisphosphate
(3) Pyruvic acid **(4)** Acetyl Co-A

109. A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested chemically. Which one of the following test results indicates that it is phloem sap ?

(1) Acidic **(2)** Alkaline
(3) Low refractive index **(4)** The absence of sugar

110. You are given a tissue with its potential for differentiation in an artificial culture. Which of the following pairs of hormones would you add to the medium to secure shoots as well as roots ?

(1) IAA and gibberellin
(2) Auxin and cytokinin
(3) Auxin and abscisic acid
(4) Gibberellin and abscisic acid

111. Phytochrome is a

(1) flavoprotein **(2)** glycoprotein
(3) lipoprotein **(4)** chromoprotein

112. Which is essential for the growth of root tip ?

(1) Zn **(2)** Fe
(3) Ca **(4)** Mn

113. The process which makes major difference between C_3 and C_4 plants is

(1) glycolysis **(2)** Calvin cycle
(3) photorespiration **(4)** respiration

114. Which one of the following statements is not correct?

(1) Offspring produced by the asexual reproduction are called clone
(2) Microscopic, motile asexual reproductive structures are called zoospores
(3) In potato, banana and ginger, the plantlets arise from the internodes present in the modified stem
(4) Water hyacinth, growing in the standing water, drains oxygen from water that leads to the death of fishes

115. Which one of the following generates new genetic combinations leading to variation ?

(1) Vegetative reproduction **(2)** Parthenogenesis
(3) Sexual reproduction **(4)** Nucellar polyembryony

116. Match column I with column II and select the correct option using the codes given below

Column I		Column II	
(A)	Pistils fused together	**(1)**	Gametogenesis
(B)	Formation of gametes	**(2)**	Pistillate
(C)	Hyphae of higher ascomycetes	**(3)**	Syncarpous
(D)	Unisexual female flower	**(4)**	Dikaryotic

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

117. In majority of angiosperms

(1) egg has a filiform apparatus
(2) there are numerous antipodal cells
(3) reduction division occurs in the megaspore mother cells
(4) a small central cell is present in the embryo sac

118. Pollination in water hyacinth and water lily is brought about by the agency of

(1) water **(2)** insects or wind
(3) birds **(4)** bats

119. The ovule of an angiosperm is technically equivalent to

(1) megasporangium **(2)** megasporophyll
(3) megaspore mother cell **(4)** megaspore

120. Taylor conducted the experiments to prove semi- conservative mode of chromosome replication on

(1) Vinca rosea **(2)** Vicia faba
(3) Drosophila melanogaster **(4)** E. coli

121. The mechanism that causes a gene to move from one linkage group to another is called

(1) inversion **(2)** duplication
(3) translocation **(4)** crossing-over

122. The equivalent of a structural gene is

(1) muton **(2)** cistron
(3) operon **(4)** recon

123. A true breeding plant is

(1) one that is able to breed on its own
(2) produced due to cross-pollination among unrelated plants
(3) near homozygous and produces offspring of its own kind
(4) always homozygous recessive in its genetic constitution

124. Which of the following rRNAs act as structural RNA as well as ribozyme in bacteria ?

(1) 5S rRNA **(2)** 18S rRNA
(3) 23S rRNA **(4)** 5.8S rRNA

125. Stirred-tank bioreactors have been designed for
(1) purification of product
(2) addition of preservatives to the product
(3) availability of oxygen throughout the process
(4) ensuring anaerobic conditions in the culture vessel

126. A foreign DNA and plasmid cut by the same restriction endonuclease can be joined to form a recombinant plasmid using
(1) Eco RI **(2)** taq polymerase
(3) polymerase III **(4)** ligase

127. Which of the following is not a component of downstream processing ?
(1) Separation **(2)** Purification
(3) Preservation **(4)** Expression

128. Which of the following restriction enzymes produces blunt ends ?
(1) Sal I **(2)** Eco RV
(3) Xho I **(4)** Hind III

129. Which kind of therapy was given in 1990 to a four-year- old girl with Adenosine Deaminase (ADA) deficiency ?
(1) Gene therapy **(2)** Chemotherapy
(3) Immunotherapy **(4)** Radiation therapy

130. How many hotspots of biodiversity in the world have been identified till date by Norman Myers ?
(1) 17 **(2)** 25
(3) 34 **(4)** 43

131. The primary producers of the deep-sea hydrothermal vent ecosystem are
(1) green algae **(2)** chemosynthetic bacteria
(3) blue-green algae **(4)** coral reefs

132. Which of the following is correct for r-selected species?
(1) Large number of progeny with small size
(2) Large number of progeny with large size
(3) Small number of progeny with small size
(4) Small number of progeny with large size

133. If '+' sign is assigned to beneficial interaction, '–' sign to detrimental and '0' sign to neutral interaction, then the population interaction represented by '+' '–' refers to
(1) mutualism **(2)** amensalism
(3) commensalism **(4)** parasitism

134. Which of the following is correctly matched ?
(1) Aerenchyma — Opuntia
(2) Age pyramid — Biome
(3) Parthenium hysterophorus — Threat to biodiversity
(4) Stratification — Population

135. Red List contains data or information on
(1) all economically important plants
(2) plants whose products are in international trade
(3) threatened species
(4) marine vertebrates only

Biology — Zoology (Q. 136–180)

136. Which of the following sets of diseases is caused by bacteria ?
(1) Cholera and tetanus **(2)** Typhoid and smallpox
(3) Tetanus and mumps **(4)** Herpes and influenza

137. Match column I with column II for housefly classification and select the correct option using the codes given below

Column I		Column II	
(A)	Family	**(1)**	Diptera
(B)	Order	**(2)**	Arthropoda
(C)	Class	**(3)**	Muscidae
(D)	Phylum	**(4)**	Insecta

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

138. Choose the correct statement.
(1) All mammals are viviparous
(2) All cyclostomes do not possess jaws and paired fins
(3) All reptiles have a three-chambered heart
(4) All Pisces have gills covered by an operculum

139. Study the four statements (I–IV) given below and select the two correct ones out of them.
I. Definition of biological species was given by Ernst Mayr.
II. Photoperiod does not affect reproduction in plants.
III. Binomial nomenclature system was given by RH Whittaker.
IV. In unicellular organisms, reproduction is synonymous with growth.
The two correct statements are
(1) II and III **(2)** III and IV
(3) I and IV **(4)** I and II

140. In male cockroaches, sperms are stored in which part of the reproductive system ?

(1) Seminal vesicles **(2)** Mushroom glands
(3) Testes **(4)** Vas deferens

141. Smooth muscles are

(1) involuntary, fusiform, non-striated
(2) voluntary, multinucleate, cylindrical
(3) involuntary, cylindrical, striated
(4) voluntary, spindle-shaped, uninucleate

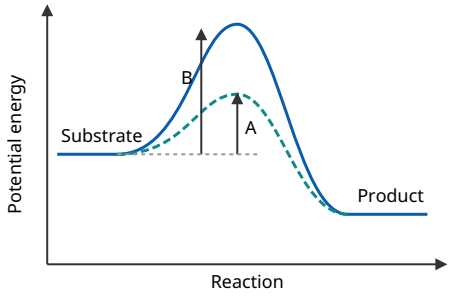
142. Oxidative phosphorylation is

(1) formation of ATP by transfer of phosphate group from a substrate to ADP
(2) oxidation of phosphate group in ATP
(3) addition of phosphate group to ATP
(4) formation of ATP by energy released from electron removed during substrate oxidation

143. Which of the following is the least likely to be involved in stabilising the three-dimensional folding of most proteins ?

(1) Hydrogen bonds **(2)** Electrostatic interaction
(3) Hydrophobic interaction **(4)** Ester bonds

144. Which of the following describes the given graph correctly ?



(1) Endothermic reaction with energy A in the presence of enzyme and B in the absence of enzyme
(2) Exothermic reaction with energy A in the presence of enzyme and B in the absence of enzyme
(3) Endothermic reaction with energy A in the absence of enzyme and B in the presence of enzyme
(4) Exothermic reaction with energy A in the absence of enzyme and B in the presence of enzyme

145. When cell has stalled DNA replication fork, which checkpoint should be predominantly activated ?

(1) G_1/S **(2)** G_2/M
(3) M **(4)** Both G_2/M and M

146. Match the stages of meiosis in column I to their characteristic features in column II and select the correct option using the codes given below

Column I		Column II	
(A)	Pachytene	**(1)**	Pairing of homologous chromosomes
(B)	Metaphase-I	**(2)**	Terminalisation of chiasmata
(C)	Diakinesis	**(3)**	Crossing-over takes place
(D)	Zygotene	**(4)**	Chromosomes align at equatorial plate

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

147. Which hormones do stimulate the production of pancreatic juice and bicarbonate ?

(1) Angiotensin and epinephrine
(2) Gastrin and insulin
(3) Cholecystokinin and secretin
(4) Insulin and glucagon

148. The partial pressure of oxygen in the alveoli of the lungs is

(1) equal to that in the blood
(2) more than that in the blood
(3) less than that in the blood
(4) less than that of carbon dioxide

149. Choose the correct statement.

(1) Nociceptors respond to changes in pressure
(2) Meissner's corpuscles are thermo-receptors
(3) Photoreceptors in the human eye are depolarised during darkness and become hyperpolarised in response to the light stimulus
(4) Receptors do not produce graded potentials

150. Graves' disease is caused due to

(1) hyposecretion of thyroid gland
(2) hypersecretion of thyroid gland
(3) hyposecretion of adrenal gland
(4) hypersecretion of adrenal gland

151. Name the ion responsible for unmasking of active sites for myosin for cross-bridge activity during muscle contraction.

(1) Calcium **(2)** Magnesium
(3) Sodium **(4)** Potassium

152. Name the blood cells, whose reduction in number can cause clotting disorder, leading to excessive loss of blood from the body.

(1) Erythrocytes **(2)** Leucocytes
(3) Neutrophils **(4)** Thrombocytes

153. Name a peptide hormone which acts mainly on hepatocytes, adipocytes and enhances cellular glucose uptake and utilisation.

(1) Insulin **(2)** Glucagon
(3) Secretin **(4)** Gastrin

154. Osteoporosis, an age-related disease of skeletal system, may occur due to

(1) immune disorder affecting neuro muscular junction leading to fatigue

(2) high concentration of Ca^{2+} and Na^{+}

(3) decreased level of oestrogen

(4) accumulation of uric acid leading to inflammation of joints

155. Serum differs from blood in

(1) lacking globulins **(2)** lacking albumins

(3) lacking clotting factors **(4)** lacking antibodies

156. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because

(1) there is a negative pressure in the lungs

(2) there is a negative intrapleural pressure pulling at the lung walls

(3) there is a positive intrapleural pressure

(4) pressure in the lungs is higher than the atmospheric pressure

157. The posterior pituitary gland is not a 'true' endocrine gland because

(1) it is provided with a duct

(2) it only stores and releases hormones

(3) it is under the regulation of hypothalamus

(4) it secretes enzymes

158. The part of nephron involved in active reabsorption of sodium is

(1) distal convoluted tubule

(2) proximal convoluted tubule

(3) Bowman's capsule

(4) descending limb of Henle's loop

159. Which of the following is hormone-releasing IUD ?

(1) LNG-20 **(2)** Multiload-375

(3) Lippes loop **(4)** Cu-7

160. Which of the following is incorrect regarding vasectomy ?

(1) No sperm occurs in seminal fluid

(2) No sperm occurs in epididymis

(3) Vasa deferentia is cut and tied

(4) Irreversible sterility

161. Embryo with more than 16 blastomeres formed due to in vitro fertilisation is transferred into

(1) uterus **(2)** fallopian tube

(3) fimbriae **(4)** cervix

162. Which of the following depicts the correct pathway of transport of sperms ?

(1) Rete testis → Efferent ductules → Epididymis → Vas deferens

(2) Rete testis → Epididymis → Efferent ductules → Vas deferens

(3) Rete testis → Vas deferens → Efferent ductules → Epididymis

(4) Efferent ductules → Rete testis → Vas deferens → Epididymis

163. Match column I with column II and select the correct option using the codes given below

Column I		Column II	
(A)	Mons pubis	**(1)**	Embryo formation
(B)	Antrum	**(2)**	Sperm
(C)	Trophectoderm	**(3)**	Female external genitalia
(D)	Nebenkern	**(4)**	Graafian follicle

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

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

164. Several hormones like hCG, hPL, oestrogen, progesterone are produced by

(1) ovary **(2)** placenta

(3) fallopian tube **(4)** pituitary

165. If a colourblind man marries a woman who is homozygous for normal colour vision, the probability of their son being colourblind is

(1) 0 **(2)** 0.5

(3) 0.75 **(4)** 1

166. Genetic drift operates in

(1) small isolated population

(2) large isolated population

(3) non-reproductive population

(4) slow reproductive population

167. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by

(1) p^2 **(2)** 2pq

(3) pq **(4)** q^2

168. The chronological order of human evolution from early to the recent is

(1) Australopithecus → Ramapithecus → Homo habilis → Homo erectus

(2) Ramapithecus → Australopithecus → Homo habilis → Homo erectus

(3) Ramapithecus → Homo habilis → Australopithecus → Homo erectus

(4) Australopithecus → Homo habilis → Ramapithecus → Homo erectus

169. Which of the following is the correct sequence of events in the origin of life ?

I. Formation of protobionts.
II. Synthesis of organic monomers.
III. Synthesis of organic polymers.
IV. Formation of DNA-based genetic systems.

(1) I, II, III, IV **(2)** I, III, II, IV
(3) II, III, I, IV **(4)** II, III, IV, I

170. A molecule that can act as a genetic material must fulfil the traits given below, except

(1) it should be able to express itself in the form of 'Mendelian characters'
(2) it should be able to generate its replica
(3) it should be unstable structurally and chemically
(4) it should provide the scope for slow changes that are required for evolution

171. DNA-dependent RNA polymerase catalyses transcription on one strand of the DNA which is called the

(1) template strand **(2)** coding strand
(3) alpha strand **(4)** anti strand

172. Interspecific hybridisation is the mating of

(1) animals within same breed without having common ancestors
(2) two different related species
(3) superior males and females of different breeds
(4) more closely related individuals within same breed for 4-6 generations

173. Which of the following is correct regarding AIDS causative agent HIV ?

(1) HIV is enveloped virus containing one molecule of single-stranded RNA and one molecule of reverse transcriptase
(2) HIV is enveloped virus that contains two identical molecules of single-stranded RNA and two molecules of reverse transcriptase
(3) HIV is unenveloped retrovirus
(4) HIV does not escape but attacks the acquired immune response

174. Among the following edible fishes, which one is marine fish having rich source of omega-3 fatty acids?

(1) Mystus **(2)** Mangur
(3) Mrigala **(4)** Mackerel

175. Match column I with column II and select the correct option using the codes given below

Column I		Column II	
(A)	Citric acid	**(1)**	Trichoderma
(B)	Cyclosporin	**(2)**	Clostridium
(C)	Statins	**(3)**	Aspergillus
(D)	Butyric acid	**(4)**	Monascus

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

176. Biochemical Oxygen Demand (BOD) may not be a good index for pollution in water bodies receiving effluents from

(1) domestic sewage **(2)** dairy industry
(3) petroleum industry **(4)** sugar industry

177. The principle of competitive exclusion was stated by

(1) C Darwin **(2)** GF Gause
(3) Mac Arthur **(4)** Verhulst and Pearl

178. Which of the following National Parks is home to the famous musk deer or hangul ?

(1) Keibul Lamjao National Park, Manipur
(2) Bandhavgarh National Park, Madhya Pradesh
(3) Eaglenest Wildlife Sanctuary, Arunachal Pradesh
(4) Dachigam National Park, Jammu and Kashmir

179. A lake which is rich in organic waste may result in

(1) increased population of aquatic organisms due to minerals
(2) drying of the lake due to algal bloom
(3) increased population of fish due to lots of nutrients
(4) mortality of fish due to lack of oxygen

180. The highest DDT concentration in aquatic food chain shall occur in

(1) phytoplankton **(2)** seagull
(3) crab **(4)** eel. ✈✈✈

Answer key & explanations

Questions as they appeared in NEET (UG) 2016 Phase II (24 July 2016) conducted by CBSE. Answers verified by competitorspoint.com. Explanations by competitorspoint.com. Answer key: CBSE released the Phase II key only to candidates on cbseneet.nic.in (no longer available) and no reliable official mirror was found; answers are the printed answers, independently checked against NCERT by competitorspoint.com. * = printed answer corrected.

91 – 2	**92** – 2	**93** – 1	**94** – 4	**95** – 3	**96** – 2	**97** – 2	**98** – 2	**99** – 1	**100** – 1
101 – 1	**102** – 3	**103** – 2	**104** – 2	**105** – 2	**106** – 1	**107** – 1	**108** – 4	**109** – 2	**110** – 2
111 – 4	**112** – 3	**113** – 3	**114** – 3	**115** – 3	**116** – 4	**117** – 3	**118** – 2	**119** – 1	**120** – 2
121 – 3	**122** – 2	**123** – 3	**124** – 3	**125** – 3	**126** – 4	**127** – 4	**128** – 2	**129** – 1	**130** – 3
131 – 2	**132** – 1	**133** – 4	**134** – 3	**135** – 3	**136** – 1	**137** – 1	**138** – 2	**139** – 3	**140** – 1
141 – 1	**142** – 4	**143** – 4*	**144** – 2	**145** – 1	**146** – 1	**147** – 3	**148** – 2	**149** – 3	**150** – 2
151 – 1	**152** – 4	**153** – 1	**154** – 3	**155** – 3	**156** – 2	**157** – 2	**158** – 2	**159** – 1	**160** – 2
161 – 1	**162** – 1	**163** – 2	**164** – 2	**165** – 1	**166** – 1	**167** – 2	**168** – 2	**169** – 3	**170** – 3
171 – 1	**172** – 2	**173** – 2	**174** – 4	**175** – 2	**176** – 3	**177** – 2	**178** – 4	**179** – 4	**180** – 2

91. **Ans (2)** Fungal cell walls are made of chitin and polysaccharides, not pure cellulose.

92. **Ans (2)** Methanogens are archaebacteria.

93. **Ans (1)** Diatom walls are siliceous and almost indestructible; they form diatomaceous earth.

94. **Ans (4)** A herbarium label gives the date and place of collection, the collector's name, and the local and botanical names, not the plant's height.

95. **Ans (3)** A thick cuticle and sunken stomata reduce water loss in conifers.

96. **Ans (2)** Algin comes from brown algae and carrageenan from red algae; the statement reverses them.

97. **Ans (2)** Polyadelphous means stamens united in more than two bundles (androecium), e.g. Citrus.

98. **Ans (2)** Different stamen lengths: didynamous Salvia and tetradynamous mustard, radish and turnip, giving four plants.

99. **Ans (1)** Brassica (Cruciferae) flowers are actinomorphic; Pisum, Cassia and Trifolium are zygomorphic.

100. **Ans (1)** Dianthus and Primrose show free-central placentation.

101. **Ans (1)** The cortex lies between the epidermis and the stele (endodermis).

102. **Ans (3)** Tyloses are balloon-like ingrowths of xylem parenchyma into vessels, typical of heartwood.

103. **Ans (2)** Ribozymes are catalytic RNA, i.e. non-protein enzymes.

104. **Ans (2)** Animal cells have small vacuoles; large central vacuoles are typical of plant cells.

105. **Ans (2)** Pili and fimbriae help in attachment and conjugation, not motility; flagella give motility.

106. **Ans (1)** Lysosomes contain hydrolytic enzymes.

107. **Ans (1)** DNA is synthesized in the S phase.

108. **Ans (4)** Fats, carbohydrates and proteins all enter respiration as acetyl CoA.

109. **Ans (2)** Phloem sap is rich in sugars and slightly alkaline.

110. **Ans (2)** A high cytokinin:auxin ratio gives shoots and a high auxin ratio gives roots, so both are added.

111. **Ans (4)** Phytochrome is a chromoprotein (protein plus a light-absorbing pigment).

112. **Ans (3)** Calcium is needed for cell wall (middle lamella) formation and mitotic spindle activity at root tips.

113. **Ans (3)** C_3 plants show photorespiration; C_4 plants largely avoid it.

114. **Ans (3)** In potato, banana and ginger, plantlets arise from nodes, not internodes.

115. **Ans (3)** Sexual reproduction (meiosis and fusion of gametes) creates new genetic combinations.

116. **Ans (4)** Pistils fused – syncarpous; gamete formation – gametogenesis; ascomycete hyphae – dikaryotic; female flower – pistillate.

117. **Ans (3)** Meiosis (reduction division) occurs in the megaspore mother cell; the central cell is large and there are three antipodals.

118. **Ans (2)** Water hyacinth and water lily, though aquatic, are pollinated by insects or wind.

119. **Ans (1)** The ovule is a megasporangium.

120. **Ans (2)** Taylor (1958) used radioactive thymidine on Vicia faba to show semi-conservative chromosome replication.

121. **Ans (3)** Translocation moves a chromosome segment to a non-homologous chromosome (another linkage group).

122. **Ans (2)** A cistron is the segment of DNA coding for a polypeptide, i.e. a structural gene.

123. **Ans (3)** True-breeding lines are near homozygous after continuous self-pollination.

124. **Ans (3)** 23S rRNA acts as a ribozyme (peptidyl transferase) in bacteria.

125. **Ans (3)** Stirred-tank bioreactors ensure mixing and oxygen availability.

126. **Ans (4)** DNA ligase joins the cut ends.

127. **Ans (4)** Downstream processing is separation, purification and preservation, not expression.

128. **Ans (2)** EcoRV cuts at the centre of its site, giving blunt ends.

129. **Ans (1)** In 1990 a 4-year-old with ADA deficiency received the first gene therapy.

130. **Ans (3)** Myers' list now has 34 biodiversity hotspots.

131. **Ans (2)** Chemosynthetic bacteria are the primary producers at hydrothermal vents.

132. **Ans (1)** r-selected species produce many small offspring.

133. **Ans (4)** Parasitism is (+, –).

134. **Ans (3)** Parthenium hysterophorus (an alien weed) threatens native biodiversity.

135. **Ans (3)** The IUCN Red List records threatened species.

136. **Ans (1)** Cholera (Vibrio) and tetanus (Clostridium) are bacterial diseases.

137. **Ans (1)** Housefly: family Muscidae, order Diptera, class Insecta, phylum Arthropoda.

138. **Ans (2)** Cyclostomes lack jaws and paired fins.

139. **Ans (3)** Mayr defined biological species, and in unicellular organisms reproduction is synonymous with growth (I and IV).

140. **Ans (1)** In cockroaches, sperms are stored in seminal vesicles as spermatophores.

141. **Ans (1)** Smooth muscles are involuntary, fusiform and non-striated.

142. **Ans (4)** Oxidative phosphorylation uses energy released by electron transport during substrate oxidation to make ATP.

143. **Ans (4)** [printed answer (1) Hydrogen bonds; corrected to (4) Ester bonds per NCERT] Ester bonds are not involved in protein folding, which is stabilized by H-bonds, ionic and hydrophobic interactions.

144. **Ans (2)** The substrate has higher energy than the product (exothermic); the enzyme lowers the activation energy (A).

145. **Ans (1)** Stalled replication activates the G_1/S (DNA damage and replication) checkpoint.

146. **Ans (1)** Pachytene – crossing over; metaphase I – alignment; diakinesis – terminalisation; zygotene – pairing.

147. **Ans (3)** Secretin (bicarbonate) and CCK (enzymes) stimulate pancreatic secretion.

148. **Ans (2)** Alveolar pO_2 (104 mm Hg) is higher than that of deoxygenated blood (40 mm Hg).

149. **Ans (3)** Photoreceptors are depolarized in darkness and hyperpolarized by light.

150. **Ans (2)** Graves' disease is a form of hyperthyroidism.

151. **Ans (1)** Ca^{2+} binds troponin, unmasking the myosin-binding sites on actin.

152. **Ans (4)** Fewer thrombocytes (platelets) cause clotting disorders.

153. **Ans (1)** Insulin acts on hepatocytes and adipocytes to increase glucose uptake.

154. **Ans (3)** Low oestrogen causes bone loss (osteoporosis).

155. **Ans (3)** Serum is plasma without clotting factors.

156. **Ans (2)** Negative intrapleural pressure keeps the lungs expanded.

157. **Ans (2)** The posterior pituitary only stores and releases hypothalamic hormones.

158. **Ans (2)** Na^+ is actively reabsorbed mainly in the PCT.

159. **Ans (1)** LNG-20 releases levonorgestrel, a hormone.

160. **Ans (2)** After vasectomy, sperms are still present in the epididymis; they are absent from the semen.

161. **Ans (1)** Embryos with more than 8 blastomeres are transferred to the uterus (IUT).

162. **Ans (1)** Rete testis → vasa efferentia → epididymis → vas deferens.

163. **Ans (2)** Mons pubis – external genitalia; antrum – Graafian follicle; trophectoderm – embryo formation (trophoblast); Nebenkern – sperm.

164. **Ans (2)** The placenta secretes hCG, hPL, oestrogen and progesterone.

165. **Ans (1)** A son gets his X from his normal homozygous mother, so the probability is 0.

166. **Ans (1)** Genetic drift is significant in small, isolated populations.

167. **Ans (2)** Heterozygote frequency is 2pq.

168. **Ans (2)** Ramapithecus → Australopithecus → Homo habilis → Homo erectus.

169. **Ans (3)** Monomers → polymers → protobionts → DNA-based genetic systems.

170. **Ans (3)** Genetic material must be stable, structurally and chemically.

171. **Ans (1)** RNA polymerase copies the template (antisense) strand.

172. **Ans (2)** Interspecific hybridization mates two different related species.

173. **Ans (2)** HIV is enveloped, with two copies of ssRNA and reverse transcriptase.

174. **Ans (4)** Mackerel is a marine fish rich in omega-3 fatty acids.

175. **Ans (2)** Citric acid – Aspergillus; cyclosporin – Trichoderma; statins – Monascus; butyric acid – Clostridium.

176. **Ans (3)** Petroleum effluents contain non-biodegradable pollutants, so BOD does not reflect them.

177. **Ans (2)** Gause stated the competitive exclusion principle.

178. **Ans (4)** Dachigam National Park (J&K) is the home of the hangul.

179. **Ans (4)** Organic waste raises BOD and depletes O_2, killing fish.

180. **Ans (2)** DDT biomagnifies, so it is highest in the top consumer (seagull).