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NEET (UG) 2024 — Biology (Botany + Zoology)

Exam date: 5 May 2024 • Test Booklet Code: Q3 • Questions 101–200 (100 questions; attempt 90) • +4 / –1

Questions as they appeared in NEET (UG) 2024 conducted by NTA. Answers verified by competitorspoint.com. Explanations by competitorspoint.com.

Botany — Section A (Q. 101–135, all compulsory)

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

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

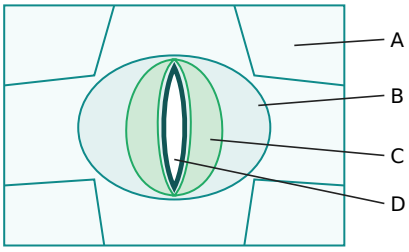
102. How many molecules of ATP and NADPH are required for every molecule of CO_2 fixed in the Calvin cycle?

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

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

(1) 8 bp **(2)** 6 bp
(3) 4 bp **(4)** 10 bp

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



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

105. The cofactor of the enzyme carboxypeptidase is :

(1) Zinc **(2)** Niacin
(3) Flavin **(4)** Haem

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

(1) Totipotency **(2)** Micropropagation
(3) Differentiation **(4)** Somatic hybridization

107. Match List I with List II

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

Choose the correct answer from the options given below:

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

108. Given below are two statements:

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

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

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

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

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

(1) Datura **(2)** Cassia
(3) Pisum **(4)** Sesbania

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

(1) in-situ conservation **(2)** Biodiversity conservation
(3) Semi-conservative method **(4)** Sustainable development

111. Identify the set of correct statements:

A. The flowers of Vallisneria are colourful and produce nectar.
B. The flowers of waterlily are not pollinated by water.
C. In most of water-pollinated species, the pollen grains are protected from wetting.
D. Pollen grains of some hydrophytes are long and ribbon like.
E. In some hydrophytes, the pollen grains are carried passively inside water.

Choose the correct answer from the options given below.

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

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

(1) Beta-galactosidase **(2)** Acetylase
(3) Permease **(4)** Polymerase

113. Match List I with List II

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

Choose the correct answer from the options given below:

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

114. The equation of Verhulst-Pearl logistic growth is $dN/dt = rN [(K – N)/K]$.

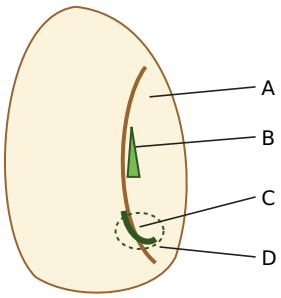
From this equation, K indicates:

(1) Intrinsic rate of natural increase
(2) Biotic potential
(3) Carrying capacity
(4) Population density

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

(1) promotes apical dominance.
(2) promotes abscission of mature leaves only.
(3) does not affect mature monocotyledonous plants.
(4) can help in cell division in grasses, to produce growth.

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



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

117. Given below are two statements:

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

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

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

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

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

A. Over exploitation
B. Co-extinction
C. Mutation
D. Habitat loss and fragmentation
E. Migration

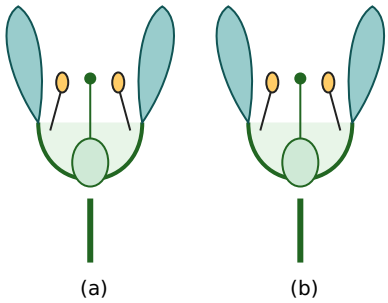
Choose the correct option:

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

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

(1) Morphology of mycelium **(2)** Mode of nutrition
(3) Mode of spore formation **(4)** Fruiting body

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



(1) (a) Epigynous; (b) Hypogynous
(2) (a) Hypogynous; (b) Epigynous
(3) (a) Perigynous; (b) Epigynous
(4) (a) Perigynous; (b) Perigynous

121. List of endangered species was released by-

(1) GEAC **(2)** WWF
(3) FOAM **(4)** IUCN

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

A. The piece of DNA would be able to multiply itself independently in the progeny cells of the organism.
B. It may get integrated into the genome of the recipient.
C. It may multiply and be inherited along with the host DNA.
D. The alien piece of DNA is not an integral part of chromosome.
E. It shows ability to replicate.

Choose the correct answer from the options given below:

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

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

A. Out of one pair of factors one is dominant and the other is recessive.
B. Alleles do not show any expression and both the characters appear as such in F2 generation.
C. Factors occur in pairs in normal diploid plants.
D. The discrete unit controlling a particular character is called factor.
E. The expression of only one of the parental characters is found in a monohybrid cross.

Choose the correct answer from the options given below:

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

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

(1) Cofactor inhibition **(2)** Feedback inhibition
(3) Competitive inhibition **(4)** Enzyme activation

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

(1) Differentiation **(2)** Redifferentiation
(3) Dedifferentiation **(4)** Maturation

126. Spindle fibers attach to kinetochores of chromosomes during

(1) Prophase **(2)** Metaphase
(3) Anaphase **(4)** Telophase

127. Tropical regions show greatest level of species richness because

A. Tropical latitudes have remained relatively undisturbed for millions of years, hence more time was available for species diversification.
B. Tropical environments are more seasonal.
C. More solar energy is available in tropics.
D. Constant environments promote niche specialization.
E. Tropical environments are constant and predictable.

Choose the correct answer from the options given below.

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

128. Given below are two statements:

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

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

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

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

129. Match List I with List II

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

Choose the correct answer from the options given below:

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

130. Bulliform cells are responsible for

(1) Inward curling of leaves in monocots.
(2) Protecting the plant from salt stress.
(3) Increased photosynthesis in monocots.
(4) Providing large spaces for storage of sugars.

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

(1) Only red flowered plants
(2) Red flowered as well as pink flowered plants
(3) Only pink flowered plants
(4) Red, Pink as well as white flowered plants

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

(1) Repressor, Operator gene, Structural gene
(2) Structural gene, Transposons, Operator gene
(3) Inducer, Repressor, Structural gene
(4) Promoter, Structural gene, Terminator

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

(1) BB **(2)** bb
(3) Bb **(4)** BB/Bb

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

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

Choose the correct answer from the options given below:

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

135. Match List I with List II

List I		List II	
A.	Two or more alternative forms of a gene	**I.**	Back cross
B.	Cross of F1 progeny with homozygous recessive parent	**II.**	Ploidy
C.	Cross of F1 progeny with any of the parents	**III.**	Allele
D.	Number of chromosome sets in plant	**IV.**	Test cross

Choose the correct answer from the options given below:

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

Botany — Section B (Q. 136–150, attempt any 10)

136. The DNA present in chloroplast is:

(1) Linear, double stranded **(2)** Circular, double stranded
(3) Linear, single stranded **(4)** Circular, single stranded

137. Match List I with List II

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

Choose the correct answer from the options given below:

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

138. Match List I with List II

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

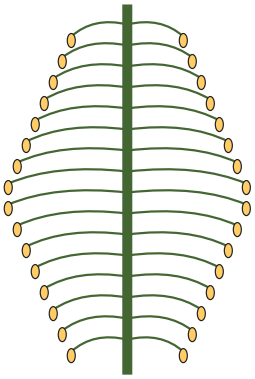
Choose the correct answer from the options given below :

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

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

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

140. Identify the correct description about the given figure:



(1) Wind pollinated plant inflorescence showing flowers with well exposed stamens.
(2) Water pollinated flowers showing stamens with mucilaginous covering.
(3) Cleistogamous flowers showing autogamy.
(4) Compact inflorescence showing complete autogamy

141. Match List I with List II

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

Choose the correct answer from the options given below:

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

142. Read the following statements and choose the set of correct statements: In the members of Phaeophyceae,

A. Asexual reproduction occurs usually by biflagellate zoospores.
B. Sexual reproduction is by oogamous method only.
C. Stored food is in the form of carbohydrates which is either mannitol or laminarin.
D. The major pigments found are chlorophyll a, c and carotenoids and xanthophyll.
E. Vegetative cells have a cellulosic wall, usually covered on the outside by gelatinous coating of algin.

Choose the correct answer from the options given below:

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

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

(1) x/10 (kcal m^{-2}) yr^{-1}
(2) x (kcal m^{-2}) yr^{-1}
(3) 10x (kcal m^{-2}) yr^{-1}
(4) 100x/3x (kcal m^{-2}) yr^{-1}

144. Match List-I with List-II

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

Choose the correct answer from the options given below.

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

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

(1) Malic acid → Oxaloacetic acid
(2) Succinic acid → Malic acid
(3) Succinyl-CoA → Succinic acid
(4) Isocitrate → α-ketoglutaric acid

146. Given below are two statements:

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

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

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

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

147. Match List I with List II

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

Choose the correct answer from the options given below:

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

148. Match List I with List II

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

Choose the correct answer from the options given below:

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

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

(1) Callus **(2)** Somatic embryos
(3) Protoplasts **(4)** Pollens

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

(1) Auxin **(2)** Gibberellin
(3) Cytokinin **(4)** Abscisic acid

Zoology — Section A (Q. 151–185, all compulsory)

151. Following are the stages of pathway for conduction of an action potential through the heart:

A. AV bundle
B. Purkinje fibres
C. AV node
D. Bundle branches
E. SA node

Choose the correct sequence of pathway from the options given below:

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

152. In both sexes of cockroach, a pair of jointed filamentous structures called anal cerci are present on

(1) 5th segment **(2)** 10th segment
(3) 8th and 9th segment **(4)** 11th segment

153. The flippers of the Penguins and Dolphins are the example of the

(1) Adaptive radiation **(2)** Natural selection
(3) Convergent evolution **(4)** Divergent evolution

154. Which of the following is not a component of Fallopian tube?

(1) Uterine fundus **(2)** Isthmus
(3) Infundibulum **(4)** Ampulla

155. Given below are some stages of human evolution. Arrange them in correct sequence. (Past to Recent)

A. Homo habilis
B. Homo sapiens
C. Homo neanderthalensis
D. Homo erectus

Choose the correct sequence of human evolution from the options given below:

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

156. Which of the following is not a steroid hormone?

(1) Cortisol **(2)** Testosterone
(3) Progesterone **(4)** Glucagon

157. Match List I with List II :

List I		List II	
A.	α-1 antitrypsin	**I.**	Cotton bollworm
B.	Cry IAb	**II.**	ADA deficiency
C.	Cry IAc	**III.**	Emphysema
D.	Enzyme replacement therapy	**IV.**	Corn borer

Choose the correct answer from the options given below:

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

158. Following are the stages of cell division :

A. Gap 2 phase
B. Cytokinesis
C. Synthesis phase
D. Karyokinesis
E. Gap 1 phase

Choose the correct sequence of stages from the options given below :

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

159. Which one of the following factors will not affect the Hardy-Weinberg equilibrium?

(1) Genetic recombination **(2)** Genetic drift
(3) Gene migration **(4)** Constant gene pool

160. Which of the following are autoimmune disorders?

A. Myasthenia gravis
B. Rheumatoid arthritis
C. Gout
D. Muscular dystrophy
E. Systemic Lupus Erythematosus (SLE)

Choose the most appropriate answer from the options given below:

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

161. Match List I with List II :

List I		List II	
A.	Typhoid	**I.**	Fungus
B.	Leishmaniasis	**II.**	Nematode
C.	Ringworm	**III.**	Protozoa
D.	Filariasis	**IV.**	Bacteria

Choose the correct answer from the options given below:

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

162. Match List I with List II

List I		List II	
A.	Expiratory capacity	**I.**	Expiratory reserve volume + Tidal volume + Inspiratory reserve volume
B.	Functional residual capacity	**II.**	Tidal volume + Expiratory reserve volume
C.	Vital capacity	**III.**	Tidal volume + Inspiratory reserve volume
D.	Inspiratory capacity	**IV.**	Expiratory reserve volume + Residual volume

Choose the correct answer from the options given below :

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

163. Match List I with List II

List I		List II	
A.	Down's syndrome	**I.**	11th chromosome
B.	α-Thalassemia	**II.**	'X' chromosome
C.	β-Thalassemia	**III.**	21st chromosome
D.	Klinefelter's syndrome	**IV.**	16th chromosome

Choose the correct answer from the options given below :

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

164. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R : Assertion A : FSH acts upon ovarian follicles in female and Leydig cells in male. Reason R : Growing ovarian follicles secrete estrogen in female while interstitial cells secrete androgen in male human being.

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

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

165. Match List I with List II :

List I		List II	
A.	Pleurobrachia	**I.**	Mollusca
B.	Radula	**II.**	Ctenophora
C.	Stomochord	**III.**	Osteichthyes
D.	Air bladder	**IV.**	Hemichordata

Choose the correct answer from the options given below

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

166. Match List I with List II

List I (Sub Phases of Prophase I)		List II (Specific characters)	
A.	Diakinesis	**I.**	Synaptonemal complex formation
B.	Pachytene	**II.**	Completion of terminalisation of chiasmata
C.	Zygotene	**III.**	Chromosomes look like thin threads
D.	Leptotene	**IV.**	Appearance of recombination nodules

Choose the correct answer from the options given below

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

167. The "Ti plasmid" of Agrobacterium tumefaciens stands for

(1) Tumour inhibiting plasmid
(2) Tumor independent plasmid
(3) Tumor inducing plasmid
(4) Temperature independent plasmid

168. Match List I with List II :

List I		List II	
A.	Cocaine	**I.**	Effective sedative in surgery
B.	Heroin	**II.**	Cannabis sativa
C.	Morphine	**III.**	Erythroxylum
D.	Marijuana	**IV.**	Papaver somniferum

Choose the correct answer from the options given below:

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

169. Which one is the correct product of DNA dependent RNA polymerase to the given template? 3'TACATGGCAAATATCCATTCA5'

(1) 5'AUGUACCGUUUAUAGGUAAGU3' **(2)** 5'AUGUAAAGUUUAUAGGUACA3'
(3) 5'AUGUACCGUUUAUAGGGAAGU3' **(4)** 5'ATGTACCGTTTATAGGTACAT3'

170. Match List I with List II :

List I		List II	
A.	Pons	**I.**	Provides additional space for Neurons, regulates posture and balance.
B.	Hypothalamus	**II.**	Controls respiration and gastric secretions.
C.	Medulla	**III.**	Connects different regions of the brain.
D.	Cerebellum	**IV.**	Neurosecretory cells

Choose the correct answer from the options given below :

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

171. Match List I with List II :

List I		List II	
A.	Lipase	**I.**	Peptide bond
B.	Nuclease	**II.**	Ester bond
C.	Protease	**III.**	Glycosidic bond
D.	Amylase	**IV.**	Phosphodiester bond

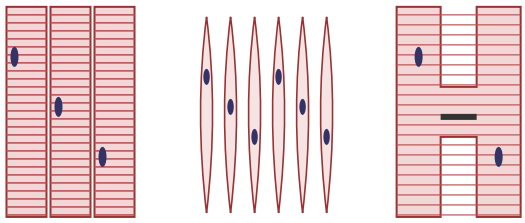
Choose the correct answer from the options given below :

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

172. Which of the following is not a natural/ traditional contraceptive method?

(1) Coitus interruptus **(2)** Periodic abstinence
(3) Lactational amenorrhea **(4)** Vaults

173. Three types of muscles are given as a, b and c. Identify the correct matching pair along with their location in human body: Name of muscle/ location



(1) (a) Smooth - Toes (b) Skeletal – Legs (c) Cardiac – Heart
(2) (a) Skeletal - Triceps (b) Smooth – Stomach (c) Cardiac – Heart
(3) (a) Skeletal - Biceps (b) Involuntary – Intestine (c) Smooth – Heart
(4) (a) Involuntary – Nose tip (b) Skeletal – Bone (c) Cardiac – Heart

174. Which of the following statements is incorrect?

(1) A bioreactor provides optimal growth conditions for achieving the desired product
(2) Most commonly used bioreactors are of stirring type
(3) Bioreactors are used to produce small scale bacterial cultures
(4) Bioreactors have an agitator system, an oxygen delivery system and foam control system

175. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R: Assertion A : Breast-feeding during initial period of infant growth is recommended by doctors for bringing a healthy baby. Reason R : Colostrum contains several antibodies absolutely essential to develop resistance for the new born baby.

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

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

176. Which of the following factors are favourable for the formation of oxyhaemoglobin in alveoli?

(1) High pO_2 and High pCO_2
(2) High pO_2 and lower H^+ concentration
(3) Low pCO_2 and High H^+ concentration
(4) Low pCO_2 and High temperature

177. Match List I with List II :

List I		List II	
A.	Common cold	**I.**	Plasmodium
B.	Haemozoin	**II.**	Typhoid
C.	Widal test	**III.**	Rhinoviruses
D.	Allergy	**IV.**	Dust mites

Choose the correct answer from the options given below :

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

178. Consider the following statements :

A. Annelids are true coelomates
B. Poriferans are pseudocoelomates
C. Aschelminthes are acoelomates
D. Platyhelminthes are pseudocoelomates

Choose the correct answer from the options given below :

(1) B only **(2)** A only
(3) C only **(4)** D only

179. Match List I with List II

List I		List II	
A.	Non-medicated IUD	**I.**	Multiload 375
B.	Copper releasing IUD	**II.**	Progestogens
C.	Hormone releasing IUD	**III.**	Lippes loop
D.	Implants	**IV.**	LNG-20

Choose the correct answer from the options given below:

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

180. Given below are two statements :

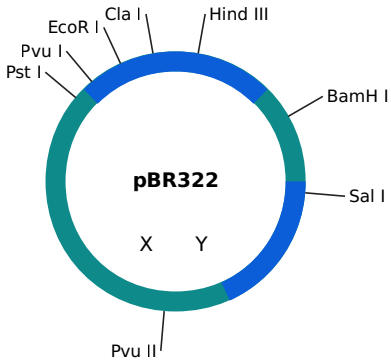
Statement I : In the nephron, the descending limb of loop of Henle is impermeable to water and permeable to electrolytes.

Statement II : The proximal convoluted tubule is lined by simple columnar brush border epithelium and increases the surface area for reabsorption.

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

(1) Both statement I and Statement II are true
(2) Both statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

181. The following diagram shows restriction sites in E. coli cloning vector pBR322. Find the role of 'X' and 'Y' genes :



(1) The gene 'X' is responsible for resistance to antibiotics and 'Y' for protein involved in the replication of Plasmid.
(2) The gene 'X' is responsible for controlling the copy number of the linked DNA and 'Y' for protein involved in the replication of Plasmid.
(3) The gene 'X' is for protein involved in replication of Plasmid and 'Y' for resistance to antibiotics.
(4) Gene 'X' is responsible for recognition sites and 'Y' is responsible for antibiotic resistance

182. Match List I with List II :

List I		List II	
A.	Axoneme	**I.**	Centriole
B.	Cartwheel pattern	**II.**	Cilia and flagella
C.	Crista	**III.**	Chromosome
D.	Satellite	**IV.**	Mitochondria

Choose the correct answer from the options given below :

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

183. Match List I with List II :

List I		List II	
A.	Pterophyllum	**I.**	Hag fish
B.	Myxine	**II.**	Saw fish
C.	Pristis	**III.**	Angel fish
D.	Exocoetus	**IV.**	Flying fish

Choose the correct answer from the options given below :

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

184. Match List I with List II :

List I		List II	
A.	Fibrous joints	**I.**	Adjacent vertebrae, limited movement
B.	Cartilaginous joints	**II.**	Humerus and Pectoral girdle, rotational movement
C.	Hinge joints	**III.**	Skull, don't allow any movement
D.	Ball and socket joints	**IV.**	Knee, help in locomotion

Choose the correct answer from the options given below :

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

185. Given below are two statements:

Statement I: The presence or absence of hymen is not a reliable indicator of virginity.

Statement II: The hymen is torn during the first coitus only.

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

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

Zoology — Section B (Q. 186–200, attempt any 10)

186. Given below are two statements:

Statement I: Gause's competitive exclusion principle states that two closely related species competing for different resources cannot exist indefinitely.

Statement II: According to Gause's principle, during competition, the inferior will be eliminated. This may be true if resources are limiting.

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

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

187. Match List I with List II related to digestive system of cockroach.

List I		List II	
A.	The structures used for storing of food.	**I.**	Gizzard
B.	Ring of 6-8 blind tubules at junction of foregut and midgut.	**II.**	Gastric Caeca
C.	Ring of 100-150 yellow coloured thin filaments at junction of midgut and hindgut.	**III.**	Malpighian tubules
D.	The structures used for grinding the food.	**IV.**	Crop

Choose the correct answer from the options given below:

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

188. The following are the statements about non-chordates:

A. Pharynx is perforated by gill slits.
B. Notochord is absent.
C. Central nervous system is dorsal.
D. Heart is dorsal if present.
E. Post anal tail is absent.

Choose the most appropriate answer from the options given below:

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

189. Choose the correct statement given below regarding juxta medullary nephron.

(1) Juxta medullary nephrons are located in the columns of Bertini.
(2) Renal corpuscle of juxta medullary nephron lies in the outer portion of the renal medulla.
(3) Loop of Henle of juxta medullary nephron runs deep into medulla.
(4) Juxta medullary nephrons outnumber the cortical nephrons.

190. Given below are two statements:

Statement I: The cerebral hemispheres are connected by nerve tract known as corpus callosum.

Statement II: The brain stem consists of the medulla oblongata, pons and cerebrum.

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

191. Given below are two statements :

Statement I : Bone marrow is the main lymphoid organ where all blood cells including lymphocytes are produced.

Statement II : Both bone marrow and thymus provide micro environments for the development and maturation of T-lymphocytes.

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

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

192. Regarding catalytic cycle of an enzyme action, select the correct sequential steps :

A. Substrate enzyme complex formation.
B. Free enzyme ready to bind with another substrate.
C. Release of products.
D. Chemical bonds of the substrate broken.
E. Substrate binding to active site.

Choose the correct answer from the options given below :

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

193. Identify the correct option (A), (B), (C), (D) with respect to spermatogenesis.

GnRH	
↓	↓
LH	(A)
↓	↓
(B)	(C)
↓	↓
Androgens	Factors
↓	↓
Formation of spermatids	(D)

(1) FSH, Leydig cells, Sertoli cells, Spermiogenesis.
(2) ICSH, Interstitial cells, Leydig cells, spermiogenesis.
(3) FSH, Sertoli cells, Leydig cells, spermatogenesis.
(4) ICSH, Leydig cells, Sertoli cells, spermatogenesis.

194. Match List I with List II:

List I		List II	
A.	Mesozoic Era	**I.**	Lower invertebrates
B.	Proterozoic Era	**II.**	Fish & Amphibia
C.	Cenozoic Era	**III.**	Birds & Reptiles
D.	Paleozoic Era	**IV.**	Mammals

Choose the correct answer from the options given below :

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

195. Match List I with List II:

List I		List II	
A.	Unicellular glandular epithelium	**I.**	Salivary glands
B.	Compound epithelium	**II.**	Pancreas
C.	Multicellular glandular epithelium	**III.**	Goblet cells of alimentary canal
D.	Endocrine glandular epithelium	**IV.**	Moist surface of buccal cavity

Choose the correct answer from the options given below:

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

196. Match List I with List II:

List I		List II	
A.	RNA polymerase III	**I.**	snRNPs
B.	Termination of transcription	**II.**	Promoter
C.	Splicing of Exons	**III.**	Rho factor
D.	TATA box	**IV.**	SnRNAs, tRNA

Choose the correct answer from the options given below :

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

197. As per ABO blood grouping system, the blood group of father is B^+, mother is A^+ and child is O^+. Their respective genotypes can be:

A. I^Bi / I^Ai / ii
B. I^BI^B / I^AI^A / ii
C. I^AI^B / iI^A / I^Bi
D. I^Ai / I^Bi / I^Ai
E. iI^B / iI^A / I^AI^B

Choose the most appropriate answer from the options given below:

(1) A only **(2)** B only
(3) C & B only **(4)** D & E only

198. Match List I with List II :

List I		List II	
A.	P wave	**I.**	Heart muscles are electrically silent.
B.	QRS complex	**II.**	Depolarisation of ventricles.
C.	T wave	**III.**	Depolarisation of atria.
D.	T-P gap	**IV.**	Repolarisation of ventricles.

Choose the correct answer from the options given below :

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

199. Given below are two statements:

Statement I: Mitochondria and chloroplasts are both double membrane bound organelles.

Statement II: Inner membrane of mitochondria is relatively less permeable, as compared to chloroplast.

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

200. Match List I with List II :

List I		List II	
A.	Exophthalmic goiter	**I.**	Excess secretion of cortisol, moon face & hyperglycemia.
B.	Acromegaly	**II.**	Hypo-secretion of thyroid hormone and stunted growth.
C.	Cushing's syndrome	**III.**	Hyper secretion of thyroid hormone & protruding eye balls.
D.	Cretinism	**IV.**	Excessive secretion of growth hormone.

Choose the correct answer from the options given below:

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

Answer key & explanations

Questions as they appeared in NEET (UG) 2024 conducted by NTA. Answers verified by competitorspoint.com. Explanations by competitorspoint.com. Source: answers printed in a published copy of the Code Q3 paper (exam date 05.05.2024), each checked against NCERT by competitorspoint.com; where we differ, our answer is shown and the printed one is noted.

101 – 2	**102** – 4	**103** – 2	**104** – 1	**105** – 1	**106** – 1	**107** – 1	**108** – 3	**109** – 1	**110** – 2
111 – 4	**112** – 3	**113** – 3	**114** – 3	**115** – 3	**116** – 3	**117** – 4	**118** – 4	**119** – 2	**120** – 4
121 – 4	**122** – 3	**123** – 2	**124** – 3	**125** – 3	**126** – 2	**127** – 1	**128** – 1	**129** – 1	**130** – 1
131 – 2	**132** – 4	**133** – 2	**134** – 3	**135** – 3	**136** – 2	**137** – 2	**138** – 1	**139** – 4	**140** – 1
141 – 2	**142** – 3	**143** – 2*	**144** – 1	**145** – 3	**146** – 3	**147** – 1	**148** – 2	**149** – 3	**150** – 2
151 – 1	**152** – 2	**153** – 3	**154** – 1	**155** – 4	**156** – 4	**157** – 3	**158** – 4	**159** – 4	**160** – 2
161 – 2	**162** – 1	**163** – 3	**164** – 4	**165** – 2	**166** – 3	**167** – 3	**168** – 4	**169** – 1	**170** – 2
171 – 3	**172** – 4	**173** – 2	**174** – 3	**175** – 1	**176** – 2	**177** – 3	**178** – 2	**179** – 4	**180** – 2
181 – 2	**182** – 4	**183** – 2	**184** – 4	**185** – 3	**186** – 4	**187** – 1	**188** – 3	**189** – 3	**190** – 3
191 – 1	**192** – 1	**193** – 1	**194** – 4	**195** – 3	**196** – 4	**197** – 1	**198** – 2	**199** – 3	**200** – 4

101. **Ans (2)** Lecithin (phosphatidylcholine) is a phospholipid – glycerol esterified with two fatty acids and a phosphorylated choline.

102. **Ans (4)** Fixing one CO_2 in the Calvin cycle uses 3 ATP and 2 NADPH (18 ATP and 12 NADPH per glucose).

103. **Ans (2)** Hind II, the first restriction endonuclease isolated, recognises a specific sequence of six base pairs.

104. **Ans (1)** Guard cells (C) of the stoma have thin outer walls and highly thickened inner walls, which lets the pore open when they become turgid.

105. **Ans (1)** Carboxypeptidase is a metalloenzyme whose cofactor is the zinc ion.

106. **Ans (1)** Totipotency is the ability of any plant cell or explant to regenerate a whole plant.

107. **Ans (1)** Rhizopus – bread mould, Ustilago – smut, Puccinia – rust, Agaricus – mushroom.

108. **Ans (3)** Bt toxins are coded by cry genes such as cryIAc; the protoxin is activated by the alkaline pH of the insect gut, not an acidic one, so Statement II is false.

109. **Ans (1)** Datura has a radially symmetrical (actinomorphic) flower; Cassia is zygomorphic, and Pisum and Sesbania are papilionaceous.

110. **Ans (2)** Removing a threatened species from its habitat into a protected setting is ex situ conservation. Of the options given, only 'biodiversity conservation' (the broad term) fits.

111. **Ans (4)** Vallisneria flowers are not colourful and have no nectar (A is wrong). Water lily is insect/wind pollinated, and pollen of water-pollinated plants is protected by mucilage, ribbon-like and carried passively.

112. **Ans (3)** The lac y gene codes for permease, which increases the cell's permeability to β-galactosides such as lactose.

113. **Ans (3)** Clostridium butylicum – butyric acid; yeast – ethanol; Trichoderma – cyclosporin A; Streptococcus – streptokinase.

114. **Ans (3)** In the logistic equation, K is the carrying capacity – the maximum population the environment can support.

115. **Ans (3)** 2,4-D and other auxins kill dicot weeds but do not affect mature monocots such as grasses.

116. **Ans (3)** In the grain, C is the radicle (enclosed by the coleorhiza), which grows into the primary root.

117. **Ans (4)** Collenchyma is a living tissue (Statement I is false). Vessels are absent in gymnosperms and characteristic of angiosperms (Statement II is true).

118. **Ans (4)** The 'evil quartet' of biodiversity loss is habitat loss/fragmentation, over-exploitation, alien species invasion and co-extinction.

119. **Ans (2)** Fungi are classified by mycelium morphology, mode of spore formation and fruiting bodies, not by mode of nutrition.

120. **Ans (4)** In both flowers the thalamus forms a cup around the ovary, with the other floral parts arising from its rim at about ovary level, so both are perigynous.

121. **Ans (4)** The IUCN publishes the Red List (Red Data Book) of threatened species.

122. **Ans (3)** A lone gene without an origin of replication cannot multiply independently. It can be maintained only if it integrates into the host genome and replicates with it.

123. **Ans (2)** The law of dominance says characters are controlled by paired discrete factors, one dominant over the other, so only one parental trait shows in a monohybrid F_1.

124. **Ans (3)** Malonate resembles succinate and competes for the active site of succinic dehydrogenase, so this is competitive inhibition.

125. **Ans (3)** Living, differentiated parenchyma regaining the ability to divide (forming interfascicular cambium) is dedifferentiation.

126. **Ans (2)** Spindle fibres attach to kinetochores and chromosomes align at the equator during metaphase.

127. **Ans (1)** The tropics have been undisturbed for long periods, receive more solar energy, and are less seasonal, constant and predictable, which promotes niche specialisation.

128. **Ans (1)** Chromosomes become visible during leptotene, and dissolution of the synaptonemal complex marks the start of diplotene, so both statements are true.

129. **Ans (1)** Nucleolus – rRNA synthesis; centriole – cartwheel organisation; leucoplasts – nutrient storage; Golgi – glycolipid formation.

130. **Ans (1)** Bulliform cells in grass leaves lose turgor under water stress and make the leaves curl inward, reducing water loss.

131. **Ans (2)** In snapdragon (incomplete dominance), pink Rr × red RR gives RR (red) and Rr (pink) in a 1 : 1 ratio.

132. **Ans (4)** A transcription unit consists of a promoter, the structural gene and a terminator.

133. **Ans (2)** A test cross with the homozygous recessive (bb) reveals whether the black-seeded plant is BB or Bb.

134. **Ans (3)** The dark (biosynthetic) reactions need CO_2 plus the ATP and NADPH from the light reactions; light and chlorophyll are not directly needed.

135. **Ans (3)** Allele – alternative forms of a gene; test cross – F_1 × recessive parent; back cross – F_1 × either parent; ploidy – number of chromosome sets.

136. **Ans (2)** Chloroplast DNA is a circular, double-stranded molecule, like prokaryotic DNA.

137. **Ans (2)** May – about 7 million species; Humboldt – species–area relationship; Ehrlich – rivet popper hypothesis; Tilman – long-term outdoor plot experiments.

138. **Ans (1)** Rose – perigynous; pea – marginal placentation; cotton – twisted aestivation; mango – drupe.

139. **Ans (4)** DNA-dependent DNA polymerase polymerises only in the 5′ → 3′ direction.

140. **Ans (1)** The figure shows a wind-pollinated inflorescence (as in grasses) whose flowers have well-exposed, pendulous stamens.

141. **Ans (2)** Krebs cycle – mitochondrial matrix; glycolysis – cytoplasm; ETS – inner mitochondrial membrane; proton gradient – intermembrane space.

142. **Ans (3)** Brown algae reproduce sexually by isogamy, anisogamy or oogamy, so B is wrong; A, C, D and E are correct.

143. **Ans (2)** **[printed copy: (3)]** By Lindeman's 10% law, 100x at T_1 → 10x at T_2 → x at T_3, so we take (2). The printed copy gives (3).

144. **Ans (1)** GLUT-4 – glucose transport into cells; insulin – hormone; trypsin – enzyme; collagen – intercellular ground substance.

145. **Ans (3)** Succinyl-CoA → succinic acid is substrate-level phosphorylation (GTP formed), not an oxidation; the other steps are dehydrogenations.

146. **Ans (3)** Photorespiration in C_3 plants lowers CO_2 fixation (I true). C_4 plants show essentially no photorespiration (II false).

147. **Ans (1)** Monoadelphous – China rose; diadelphous – pea; polyadelphous – Citrus; epiphyllous – lily.

148. **Ans (2)** Griffith – transformation; Jacob & Monod – lac operon; Khorana – genetic code; Meselson & Stahl – semi-conservative replication.

149. **Ans (3)** Somatic hybridisation fuses isolated protoplasts (cells with the walls digested away) of two varieties.

150. **Ans (2)** Gibberellins elongate sugarcane stems, increasing yield by about 20 tonnes per acre.

151. **Ans (1)** Conduction runs SA node → AV node → AV bundle (bundle of His) → bundle branches → Purkinje fibres.

152. **Ans (2)** Both sexes of cockroach have a pair of anal cerci on the 10th abdominal segment.

153. **Ans (3)** Penguin and dolphin flippers are analogous structures that evolved through convergent evolution.

154. **Ans (1)** The fallopian tube has an infundibulum, ampulla and isthmus; the fundus belongs to the uterus.

155. **Ans (4)** Sequence: Homo habilis → H. erectus → Neanderthal man → H. sapiens.

156. **Ans (4)** Glucagon is a peptide hormone; cortisol, testosterone and progesterone are steroids.

157. **Ans (3)** α-1 antitrypsin – emphysema; cryIAb – corn borer; cryIAc – cotton bollworm; enzyme replacement – ADA deficiency.

158. **Ans (4)** The cell cycle runs G_1 → S → G_2 → karyokinesis → cytokinesis.

159. **Ans (4)** Recombination, drift and migration upset Hardy–Weinberg equilibrium; a constant gene pool is the equilibrium condition itself.

160. **Ans (2)** Myasthenia gravis, rheumatoid arthritis and SLE are autoimmune; gout is a metabolic disorder and muscular dystrophy is genetic.

161. **Ans (2)** Typhoid – bacterium; leishmaniasis – protozoan; ringworm – fungus; filariasis – nematode.

162. **Ans (1)** Expiratory capacity = TV + ERV; FRC = ERV + RV; VC = ERV + TV + IRV; IC = TV + IRV.

163. **Ans (3)** Down's – chromosome 21; α-thalassemia – chromosome 16; β-thalassemia – chromosome 11; Klinefelter's – X chromosome (XXY).

164. **Ans (4)** In males FSH acts on Sertoli cells, not Leydig cells, so A is false. R is true.

165. **Ans (2)** Pleurobrachia – Ctenophora; radula – Mollusca; stomochord – Hemichordata; air bladder – Osteichthyes.

166. **Ans (3)** Diakinesis – terminalisation of chiasmata completed; pachytene – recombination nodules; zygotene – synaptonemal complex; leptotene – thin threads.

167. **Ans (3)** The Ti plasmid of Agrobacterium is the tumour-inducing plasmid.

168. **Ans (4)** Cocaine – Erythroxylum; heroin – from Papaver somniferum; morphine – sedative in surgery; marijuana – Cannabis sativa.

169. **Ans (1)** The RNA is complementary and antiparallel to the 3′→5′ template, with U in place of T: 5′AUGUACCGUUUAUAGGUAAGU3′.

170. **Ans (2)** Pons – connects brain regions; hypothalamus – neurosecretory cells; medulla – respiration and gastric secretion; cerebellum – posture and balance.

171. **Ans (3)** Lipase – ester bond; nuclease – phosphodiester bond; protease – peptide bond; amylase – glycosidic bond.

172. **Ans (4)** Vaults are barrier methods; coitus interruptus, periodic abstinence and lactational amenorrhea are natural methods.

173. **Ans (2)** (a) Striated, unbranched skeletal muscle (e.g. triceps); (b) spindle-shaped smooth muscle (stomach wall); (c) branched cardiac muscle (heart).

174. **Ans (3)** Bioreactors are used for large-scale (100–1000 L) culture, not small-scale culture.

175. **Ans (1)** Colostrum contains antibodies (IgA) that give the newborn passive immunity, which is why breast-feeding is recommended. R explains A.

176. **Ans (2)** In the alveoli, high pO_2, low pCO_2, lower H^+ and lower temperature favour oxyhaemoglobin formation.

177. **Ans (3)** Common cold – rhinoviruses; haemozoin – Plasmodium; Widal test – typhoid; allergy – dust mites.

178. **Ans (2)** Only A is correct: poriferans have no coelom, aschelminthes are pseudocoelomates and platyhelminthes are acoelomates.

179. **Ans (4)** Non-medicated IUD – Lippes loop; Cu-IUD – Multiload 375; hormonal IUD – LNG-20; implants – progestogens.

180. **Ans (2)** The descending limb is permeable to water but nearly impermeable to electrolytes, and the PCT has simple cuboidal (not columnar) brush-border epithelium, so both statements are false.

181. **Ans (2)** In pBR322, X is ori (controls copy number) and Y is rop (codes proteins for plasmid replication).

182. **Ans (4)** Axoneme – cilia/flagella; cartwheel – centriole; crista – mitochondria; satellite – chromosome.

183. **Ans (2)** Pterophyllum – angel fish; Myxine – hagfish; Pristis – saw fish; Exocoetus – flying fish.

184. **Ans (4)** Fibrous – skull bones; cartilaginous – adjacent vertebrae; hinge – knee; ball and socket – humerus with pectoral girdle.

185. **Ans (3)** The hymen can tear from a fall, exercise and so on, so presence or absence is no proof of virginity. Statement II is false.

186. **Ans (4)** Gause's principle concerns species competing for the same resources, so Statement I is false. Statement II is correct.

187. **Ans (1)** Food storage – crop; 6–8 blind tubules – gastric caeca; 100–150 yellow filaments – Malpighian tubules; grinding – gizzard.

188. **Ans (3)** Non-chordates lack a notochord, have a dorsal heart (if present) and no post-anal tail; their pharynx has no gill slits and their nerve cord is ventral.

189. **Ans (3)** Juxtamedullary nephrons have long loops of Henle that dip deep into the medulla; they are fewer than cortical nephrons.

190. **Ans (3)** The corpus callosum joins the cerebral hemispheres. The brain stem is midbrain + pons + medulla, not the cerebrum.

191. **Ans (1)** Bone marrow produces all blood cells including lymphocytes, and bone marrow and thymus provide micro-environments for T-cell development.

192. **Ans (1)** Substrate binds the active site → ES complex forms → bonds break → products are released → free enzyme is ready again.

193. **Ans (1)** GnRH → LH → Leydig cells → androgens; GnRH → FSH → Sertoli cells → factors → spermiogenesis.

194. **Ans (4)** Mesozoic – birds & reptiles; Proterozoic – lower invertebrates; Cenozoic – mammals; Paleozoic – fish & amphibia.

195. **Ans (3)** Unicellular – goblet cells; compound – moist buccal lining; multicellular – salivary glands; endocrine – pancreas (islets).

196. **Ans (4)** RNA polymerase III – tRNA, snRNAs; termination – rho factor; splicing – snRNPs; TATA box – promoter.

197. **Ans (1)** An O child (ii) needs both parents to carry i, so the father is I^Bi and the mother I^Ai – only set A.

198. **Ans (2)** P wave – atrial depolarisation; QRS – ventricular depolarisation; T wave – ventricular repolarisation; T–P gap – electrically silent.

199. **Ans (3)** Both organelles are double-membrane bound. The inner chloroplast membrane, not the mitochondrial one, is described in NCERT as relatively less permeable, so II is incorrect.

200. **Ans (4)** Exophthalmic goitre – hyperthyroidism; acromegaly – excess GH; Cushing's – excess cortisol; cretinism – hypothyroidism.