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NEET (UG) 2022 — Biology (Botany + Zoology)

Exam date: 17 July 2022 • Test Booklet Code: Q1 • Questions 101–200 (100 questions; attempt 90) • +4 / –1

Questions as they appeared in NEET (UG) 2022 conducted by NTA. Answers per NTA final key. Explanations by competitorspoint.com.

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

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

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

102. 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) and (c) Only **(2)** (a) and (d) Only
(3) (b), (c), (d) and (e) Only **(4)** (a), (b), (d) and (e) Only

103. 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) 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

104. Hydrocolloid carrageen is obtained from:

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

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

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

106. Which of the following is incorrectly matched?

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

107. The process of translation of mRNA to proteins begins as soon as :

(1) The small subunit of ribosome encounters mRNA
(2) The larger subunit of ribosome encounters mRNA
(3) Both the subunits join together to bind with mRNA
(4) The tRNA is activated and the larger subunit of ribosome encounters mRNA

108. Match List-I with List-II

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

Choose the correct answer from the options given below:

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

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

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

110. Given below are two statements :

Statement I : The primary CO_2 acceptor in C_4 plants is phosphoenolpyruvate and is found in the mesophyll cells.

Statement II : Mesophyll cells of C_4 plants lack RuBisCo enzyme.

In the light of the above statements, choose the correct 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

111. Which one of the following is not true regarding the release of energy during ATP synthesis through chemiosmosis? It involves:

(1) Breakdown of proton gradient
(2) Breakdown of electron gradient
(3) Movement of protons across the membrane to the stroma
(4) Reduction of NADP to $NADPH_2$ on the stroma side of the membrane

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

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

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

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

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

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

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

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

116. Which one of the following plants does not show plasticity?

(1) Cotton
(2) Coriander
(3) Buttercup
(4) Maize

117. DNA polymorphism forms the basis of :

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

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

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

119. 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) 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

120. The gaseous plant growth regulator is used in plants to :

(1) speed up the malting process
(2) promote root growth and root hair formation to increase the absorption surface
(3) help overcome apical dominance
(4) kill dicotyledonous weeds in the fields

121. The device which can remove particulate matter present in the exhaust from a thermal power plant is :

(1) STP
(2) Incinerator
(3) Electrostatic Precipitator
(4) Catalytic Convertor

122. 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) 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

123. Exoskeleton of arthropods is composed of :

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

124. 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), (d), (e) Only **(2)** (a), (c), (d) Only
(3) (b), (e) Only **(4)** (a), (c), (e) Only

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

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

126. 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) (a), (b), (c) Only **(2)** (b), (c) Only
(3) (d), (e) Only **(4)** (c), (d), (e) Only

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

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

128. 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) and (d) Only **(2)** (b), (c), (d) and (e) Only
(3) (a), (b), (c) and (d) Only **(4)** (a), (c), (d) and (e) Only

129. Identify the incorrect statement related to Pollination :

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

130. Which one of the following statement is not true regarding gel electrophoresis technique?

(1) The process of extraction of separated DNA strands from gel is called elution.
(2) The separated DNA fragments are stained by using ethidium bromide.
(3) The presence of chromogenic substrate gives blue coloured DNA bands on the gel.
(4) Bright orange coloured bands of DNA can be observed in the gel when exposed to UV light.

131. 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) ABA **(2)** Gibberellin
(3) Ethylene **(4)** Cytokinin

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

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

133. 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) (a) and (b) Only **(2)** (c) and (d) Only
(3) (d) and (e) Only **(4)** (b) and (d) Only

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

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

135. 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) 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

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

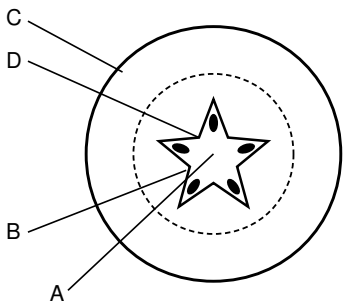
136. Transposons can be used during which one of the following ?

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

137. 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) Predation **(2)** Amensalism
(3) Commensalism **(4)** Competition

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



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

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

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

Choose the correct answer from the options given below:

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

140. 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 arm
(b)	Acrocentric chromosome	**(ii)**	Centromere at the terminal end
(c)	Submetacentric chromosome	**(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)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
(2) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
(3) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
(4) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

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

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

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

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

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

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

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

(1) 5′ GATACT 3′; 3′ CTATGA 5′ **(2)** 5′ GAATTC 3′; 3′ CTTAAG 5′
(3) 5′ CTCAGT 3′; 3′ GAGTCA 5′ **(4)** 5′ GTATTC 3′; 3′ CATAAG 5′

145. Read the following statements on lipids and find out correct set of statements: (a) Lecithin found in the plasma membrane is a glycolipid (b) Saturated fatty acids possess one or more C = C bonds (c) Gingelly 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) (a), (b) and (c) only **(2)** (a), (d) and (e) only
(3) (c), (d) and (e) only **(4)** (a), (b) and (d) only

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

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

147. 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) Sequence annotation **(2)** Gene mapping
(3) Expressed sequence tags **(4)** Bioinformatics

148. 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) 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

149. The anatomy of springwood shows 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 shows alternate concentric rings forming annual rings (e) It has lower density

Choose the correct answer from the options given below :

(1) (a), (b), (d) and (e) Only **(2)** (a), (c), (d) and (e) Only

(3) (a), (b) and (d) Only **(4)** (c), (d) and (e) Only

150. 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) CNG burns more efficiently than diesel

(2) The same diesel engine is used in CNG buses making the cost of conversion low

(3) It is cheaper than diesel

(4) It cannot be adulterated like diesel

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

151. In-situ conservation refers to:

(1) Protect and conserve the whole ecosystem

(2) Conserve only high-risk species

(3) Conserve only endangered species

(4) Conserve only extinct species

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

(1) Corvus, Columba, Chameleon

(2) Bufo, Balaenoptera, Bangarus

(3) Catla, Columba, Crocodilus

(4) Pavo, Psittacula, Corvus

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

(1) 3.3×10^9 bp **(2)** 6.6×10^9 bp

(3) 3.3×10^6 bp **(4)** 6.6×10^6 bp

154. 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) 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

155. 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) 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

156. 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) (c) and (e) only **(2)** (b) and (c) only

(3) (b), (d) and (e) only **(4)** (b), (c) and (e) only

157. 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) 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

158. 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) 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

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

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

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

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

161. 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) 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

162. Which of the following is not a connective tissue?

(1) Blood **(2)** Adipose tissue
(3) Cartilage **(4)** Neuroglia

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

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

164. Regarding Meiosis, which of the statements is incorrect?

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

165. In an E. coli strain i gene gets mutated and its product cannot bind the inducer molecule. If growth medium is provided with lactose, what will be the outcome?

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

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

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

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

(1) Trichoderma polysporum
(2) Clostridium butylicum
(3) Aspergillus niger
(4) Streptococcus cerevisiae

168. 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) 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

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

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

170. 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) 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

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

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

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

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

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

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

174. Tegmina in cockroach arises from:

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

175. 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) 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

176. 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) 0.1
(2) 10
(3) 1.0
(4) zero

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

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

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

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

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

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

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

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

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

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

182. Identify the asexual reproductive structure associated with Penicillium :

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

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

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

184. Select the incorrect statement with reference to mitosis:

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

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

(1) Catabolism **(2)** Fragmentation
(3) Humification **(4)** Decomposition

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

186. 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) 25% **(2)** 50%
(3) 75% **(4)** 100%

187. Select the incorrect statement with respect to acquired immunity.

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

188. Statements related to human Insulin are given below. Which statement(s) is/are correct about genetically engineered Insulin? (a) Pro-hormone insulin contains an 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 cattle 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) (a), (b) and (d) only **(2)** (b) only
(3) (c) and (d) only **(4)** (c), (d) and (e) only

189. Which one of the following statements is correct?

(1) The atrio-ventricular node (AVN) generates an action potential to stimulate atrial contraction

(2) The tricuspid and the bicuspid valves open due to the pressure exerted by the simultaneous contraction of the atria

(3) Blood moves freely from atrium to the ventricle during joint diastole.

(4) Increased ventricular pressure causes closing of the semilunar valves.

190. Match List-I with List-II

List I (Molecules)		List II (Biological functions)	
(a)	Glycogen	**(i)**	Hormone
(b)	Globulin	**(ii)**	Biocatalyst
(c)	Steroids	**(iii)**	Antibody
(d)	Thrombin	**(iv)**	Storage product

Choose the correct answer from the options given below:

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

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

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

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

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

(1) 20 cells **(2)** 40 cells

(3) 60 cells **(4)** 80 cells

192. 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, d, b, c **(2)** d, b, a, c

(3) a, b, c, d **(4)** a, c, b, d

193. Which of the following are not the effects of Parathyroid hormone? (a) Stimulates the process of bone resorption (b) Decreases Ca^{2+} level in blood (c) Reabsorption of Ca^{2+} by renal tubules (d) Decreases the absorption of Ca^{2+} from digested food (e) Increases metabolism of carbohydrates

Choose the most appropriate answer from the options given below:

(1) (a) and (c) only **(2)** (b), (d) and (e) only

(3) (a) and (e) only **(4)** (b) and (c) only

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

(1) Presence of origin of replication

(2) Presence of a marker gene

(3) Presence of single restriction enzyme site

(4) Presence of two or more recognition sites

195. Which of the following statements is not true?

(1) Analogous structures are a result of convergent evolution

(2) Sweet potato and potato is an example of analogy

(3) Homology indicates common ancestry

(4) Flippers of penguins and dolphins are a pair of homologous organs

196. Select the incorrect statement regarding synapses :

(1) The membranes of presynaptic and postsynaptic neurons are in close proximity in an electrical synapse.

(2) Electrical current can flow directly from one neuron into the other across the electrical synapse.

(3) Chemical synapses use neurotransmitters

(4) Impulse transmission across a chemical synapse is always faster than that across an electrical synapse.

197. 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)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

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

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

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

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

199. Which of the following is a correct statement?

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

200. Given below are two statements:

Statement 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) cannot 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) 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

Answer key & explanations

Questions as they appeared in NEET (UG) 2022 conducted by NTA. Answers per NTA final key. Explanations by competitorspoint.com. Answer key: NTA NEET (UG) 2022 final answer key, Set Q1. No questions were dropped or awarded as bonus for Q101–200.

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

101. **Ans (2)** National parks protect species in their natural habitat (in situ); IVF, micropropagation and cryopreservation are ex situ methods.

102. **Ans (3)** Cucumber/pumpkin tendrils come from axillary buds, Opuntia has a flattened green phylloclade, Rhizophora has pneumatophores and runners/stolons propagate grasses and strawberry. In Citrus and Bougainvillea, thorns are modified axillary buds, not leaflets.

103. **Ans (3)** Decomposition is microbial breakdown of detritus, but it is slower, not faster, when detritus is rich in lignin and chitin.

104. **Ans (3)** Carrageen is a hydrocolloid obtained from red algae (Rhodophyceae); brown algae give algin.

105. **Ans (2)** Vexillary aestivation and diadelphous (9+1) stamens are typical of Fabaceae, e.g. pea (Pisum sativum).

106. **Ans (2)** Ulothrix is a green alga that stores starch; mannitol and laminarin are stored by brown algae.

107. **Ans (1)** Translation starts when the small ribosomal subunit binds the mRNA at the start codon (initiation).

108. **Ans (2)** Mn – water splitting in photosynthesis; Mg – activates respiratory enzymes; B – pollen germination; Fe – activates catalase.

109. **Ans (3)** Pairing (synapsis) of homologous chromosomes happens only in meiosis I (zygotene), never in mitosis.

110. **Ans (1)** PEP is the primary CO_2 acceptor in C_4 mesophyll cells, and RuBisCO is absent there (it is located in bundle sheath cells), so both statements are correct.

111. **Ans (2)** Chemiosmosis is driven by the breakdown of a proton gradient, not an 'electron gradient'.

112. **Ans (3)** These are the 'Evil Quartet', the four major causes of biodiversity loss.

113. **Ans (3)** Glycolysis makes 4 ATP and uses 2, giving a net gain of 2 ATP per glucose.

114. **Ans (2)** Removing a ring of bark (phloem) stops food from moving downward, showing that phloem transports food.

115. **Ans (3)** Cytoplasmic streaming aids symplastic movement; the apoplast is non-living wall and intercellular space.

116. **Ans (4)** Heterophylly (plasticity) is seen in cotton, coriander, larkspur and buttercup; maize shows no such plasticity.

117. **Ans (3)** Polymorphism in DNA (VNTRs/SNPs) underlies both genetic mapping and DNA fingerprinting.

118. **Ans (3)** Grasshoppers show XO sex determination: males have only one X (XO).

119. **Ans (2)** Both statements are true, but the ampicillin-resistance marker has nothing to do with PCR amplification.

120. **Ans (2)** Ethylene, the gaseous PGR, promotes root growth and root hair formation.

121. **Ans (3)** An electrostatic precipitator removes over 99% of particulate matter from thermal plant exhaust.

122. **Ans (1)** Cleistogamous flowers never open, so they are always self-pollinated; this rules out cross-pollination, which is a disadvantage.

123. **Ans (3)** The arthropod exoskeleton is made of chitin.

124. **Ans (2)** Euchromatin is loosely packed, histones are basic (rich in lysine and arginine) and the negatively charged DNA wraps the histone octamer. Heterochromatin is inactive, and a nucleosome holds about 200 bp.

125. **Ans (3)** In predation, the predator benefits (+) and the prey is harmed (–), so the two are not both negatively affected.

126. **Ans (2)** Gulmohar and Cassia (Caesalpinioideae) have zygomorphic flowers; mustard, Datura and chilli have actinomorphic flowers.

127. **Ans (2)** Alnus root nodules are formed by the actinomycete Frankia.

128. **Ans (2)** [source copy says no option fully correct; NTA final key retains (2)] Conjoint closed bundles lack cambium, open bundles have cambium between xylem and phloem, the dicot stem has endarch protoxylem and monocot roots are polyarch. Radial arrangement in roots involves separate xylem and phloem bundles, so (a) is excluded.

129. **Ans (4)** Bees, not moths and butterflies, are the dominant insect pollinators.

130. **Ans (3)** Chromogenic substrate (blue colonies) is used for insertional inactivation in recombinant selection, not for staining DNA bands on a gel.

131. **Ans (3)** Ethylene increases female flowers in cucumber and so raises yield.

132. **Ans (4)** Lactic acid or alcoholic fermentation releases less than 7% of the energy in glucose.

133. **Ans (1)** Heartwood is dark and resistant because tannins, resins, oils, gums and aromatic substances are deposited in the central layers.

134. **Ans (3)** Recombination nodules mark the sites where crossing over occurs in pachytene.

135. **Ans (1)** Mendel studied seven contrasting traits: seed shape and colour, flower colour, pod shape and colour, flower position and stem height.

136. **Ans (2)** RNAi (gene silencing) can arise from mobile genetic elements (transposons) that replicate via an RNA intermediate.

137. **Ans (1)** Predation (and parasitism) is a +/– interaction.

138. **Ans (3)** Apple is a false fruit because its fleshy part develops from the thalamus (C).

139. **Ans (2)** Spirogyra – haploid gametophyte dominant; fern – sporophyte with prothallus; Funaria – leafy gametophyte with dependent sporophyte; Cycas – sporophyte with reduced gametophytes.

140. **Ans (1)** Metacentric – middle; acrocentric – near the end; submetacentric – slightly off-centre; telocentric – terminal centromere.

141. **Ans (2)** Solutes lower water potential (the solute potential is negative).

142. **Ans (2)** Myotonic dystrophy is an autosomal dominant Mendelian disorder.

143. **Ans (3)** Weathering of rocks releases phosphate into the cycle; rocks are its main reservoir.

144. **Ans (2)** GAATTC/CTTAAG reads the same 5′→3′ on both strands (EcoRI site).

145. **Ans (3)** Gingelly oil has a low melting point, lipids dissolve in organic solvents and one esterified fatty acid gives a monoglyceride. Lecithin is a phospholipid, and saturated fatty acids have no C=C bonds.

146. **Ans (2)** Kranz bundle sheath cells have many chloroplasts and run the Calvin cycle in C_4 plants.

147. **Ans (1)** Sequencing the whole genome first and assigning function later is sequence annotation.

148. **Ans (3)** Closely linked genes do not assort independently; the reason given is false.

149. **Ans (2)** Springwood (earlywood) is light in colour, low in density and has wide vessels, and it forms annual rings with autumnwood.

150. **Ans (2)** CNG buses need modified engines, so the conversion cost is not low.

151. **Ans (1)** In-situ conservation protects the whole ecosystem in which species live.

152. **Ans (4)** Crop and gizzard are found in birds: peacock (Pavo), parrot (Psittacula) and crow (Corvus).

153. **Ans (1)** Number of bp = $1.1\ m \div 0.34 \times 10^{-9}\ m \approx 3.3 \times 10^{9}$ bp.

154. **Ans (1)** Fatty acids and glycerol form micelles, are absorbed into intestinal cells and reach the blood via lacteals as chylomicrons. Statement I is wrong and Statement II is correct.

155. **Ans (3)** In autoimmunity, the body attacks self cells; rheumatoid arthritis is one example, so Statement II is false.

156. **Ans (4)** In spermatogenesis, gametes differentiate after meiosis, meiosis is continuous from stem cells and the process begins at puberty. Oogenesis begins in the foetus.

157. **Ans (3)** Osteoporosis is caused by reduced, not increased, estrogen.

158. **Ans (1)** Restriction enzymes recognise palindromes and cut a little away from the centre of the site, leaving sticky ends.

159. **Ans (3)** Lippes loop is a non-medicated IUD.

160. **Ans (2)** Every 100 ml of oxygenated blood delivers about 5 ml of O_2 to the tissues.

161. **Ans (1)** Both statements are true, but replacement of the notochord does not explain why not all chordates are vertebrates.

162. **Ans (4)** Neuroglia is part of neural tissue; blood, adipose tissue and cartilage are connective tissues.

163. **Ans (4)** Birds (Pavo) excrete uric acid as pellets or paste (uricotelic).

164. **Ans (2)** DNA replication happens in the S phase of interphase before meiosis I, not in meiosis II.

165. **Ans (3)** A mutant repressor that cannot bind the inducer stays on the operator, so z, y and a are not expressed.

166. **Ans (1)** Arthritis is inflammation of joints; tetany is due to low Ca^{2+}, myasthenia gravis is autoimmune and muscular dystrophy is genetic.

167. **Ans (1)** Cyclosporin A is produced by the fungus Trichoderma polysporum.

168. **Ans (3)** Mycoplasma are tiny enough to pass filters (about 0.1 µm) but they lack a cell wall.

169. **Ans (4)** Saliva lubricates the mouth, kills bacteria (lysozyme) and starts starch digestion; it does not digest disaccharides.

170. **Ans (4)** The clot network is made of fibrin, not thrombin; the spleen is the graveyard of RBCs.

171. **Ans (3)** $2\ C_6H_{12}O_6 - H_2O = C_{12}H_{22}O_{11}$.

172. **Ans (3)** Prokaryotes have no endoplasmic reticulum at all.

173. **Ans (2)** Intervertebral discs between vertebrae are made of fibrocartilage.

174. **Ans (2)** Tegmina (forewings) of cockroach arise from the mesothorax.

175. **Ans (3)** Spermiation is the release of sperms into the seminiferous tubules; spermiogenesis is spermatid to sperm, not spermatogonia to sperm.

176. **Ans (1)** Death rate = 8/80 = 0.1 per individual per week.

177. **Ans (2)** When a value other than the mean is favoured, the population shifts to one side: directional selection.

178. **Ans (4)** Gas exchange happens in the exchange part (alveoli); the conducting part only filters, humidifies and warms air.

179. **Ans (3)** Breeding crops for higher nutrients is biofortification.

180. **Ans (1)** The ascending order is Species → Genus → Family → Order → Class → Phylum → Kingdom (option 1 lists the same sequence from the top).

181. **Ans (2)** Oogenesis begins during embryonic (foetal) development.

182. **Ans (2)** Penicillium reproduces asexually by conidia.

183. **Ans (4)** Engineered lymphocytes are mortal, so infusions must be repeated.

184. **Ans (2)** Spindle fibres attach to kinetochores, not directly to the centromere.

185. **Ans (2)** Breaking detritus into smaller particles is fragmentation.

186. **Ans (4)** A colour-blind mother (X^cX^c) and a colour-blind father (X^cY, because his colour-blind mother passed him her only kind of X) give 100% colour-blind progeny.

187. **Ans (4)** Acquired immunity is specific and develops after birth; innate immunity is non-specific.

188. **Ans (2)** Humulin was made by producing the A and B chains separately in E. coli and linking them by disulphide bonds.

189. **Ans (3)** Blood flows freely from atria to ventricles during joint diastole; the SAN, not the AVN, starts atrial contraction.

190. **Ans (4)** Glycogen – storage; globulin – antibody; steroids – hormone; thrombin – biocatalyst (enzyme).

191. **Ans (3)** In 60 min (3 generations of 20 min), 10 cells become 80, of which 20 keep a hybrid ^{15}N strand, so 60 cells are free of ^{15}N.

192. **Ans (4)** Distances fit a–c 5, c–b 15, b–d 9, a–d 29, giving the order a, c, b, d.

193. **Ans (2)** PTH raises blood Ca^{2+} and increases Ca^{2+} absorption; it does not affect carbohydrate metabolism.

194. **Ans (4)** A cloning vector should have a single site for a given restriction enzyme; two or more sites complicate cloning.

195. **Ans (4)** Penguin and dolphin flippers are analogous (convergent), not homologous.

196. **Ans (4)** Transmission across an electrical synapse is faster than across a chemical one.

197. **Ans (1)** Bronchioles – ciliated epithelium; goblet cell – glandular; tendon – dense regular; adipose – loose connective tissue.

198. **Ans (2)** Diaphragm covers the cervix; pills inhibit ovulation/implantation; IUDs increase phagocytosis of sperm; lactational amenorrhea – no cycle after parturition.

199. **Ans (1)** Cyanobacteria are autotrophic Monerans; bacteria are not exclusively heterotrophic, slime moulds are Protista and Mycoplasma lack a cell wall.

200. **Ans (4)** Statement I describes an electrostatic precipitator, not a scrubber; a scrubber removes gases such as SO_2, and the ESP removes PM.