BIOLOGY

91. Function micropyle in a mature seed is
a. Entry of pollen tube
b. Entry of fertilization tube
c. Entry of water and air
d. All

92. What serves as the landing platform for pollen grains?
a. Style b. Stamen
c. Ovary d. Stigma

93. The difference between DNA and RNA is that
a. DNA has thymine and RNA has uracil
b. DNA has no oxygen bonded to the 2' carbon ; RNA does
c. DNA is the genetic material ; RNA is not
d. DNA is double stranded and RNA can't have hydrogen bond

94. If Hershey and Chase has found "S" in both the pellet and the supernatant, the conclusion about the nature of DNA replication would be that
a. Protein must be the information molecule
b. It would be difficult to conclude anything from these results
c. DNA is the genetic information molecule
d. Phage must have stuck to the bacteria

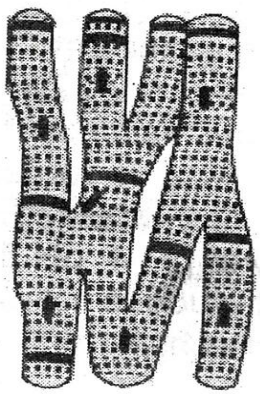
95. Allergic condition caused by pollen grains of certain flowers causing inflammation of the nose is called
a. laryngitis
b. Rhinitis
c. Pharyngitis
d. Bronchitis

96. Antigen binding site in an antibody is found between
a. two light chains
b. two heavy chains
c. one heavy and one light chain
d. either between two light chains or between one heavy light chain depending upon the nature of antigen.

97. Haploid plantlets can be produced by
a. Pollen culture
b. Cotyledon culture
c. Embryo culture
d. Meristem culture

98. Pseudocarps are fruits that develop from the entire inflorescence. They are also known as composite fruits. Which of the following plants produces composite fruits?
a. Rasphberry b. Calotropis
c. Pineapple d. Mango

99. The given diagram illustrates a type of muscular tissue.



The type of muscle tissue illustrated in the diagram is found in
a. Heart b. Triceps
c. Stomach d. Intestine

100. Molecular structure of a substrate to form a new substance. To which group of enzymes does the given enzyme belong?
a. Oxidoreductases b. isomerases
c. hydrolases d. ligases

101. The genetic material in prokaryotes is not organized into a nucleus. It lies without a well defined boundary in the cytoplasm. The genetic material inside a bacterial cell is present as a
a. nucleus b. nucleoid
c. nucleolus d. nucleosome

102. Which of the following organisms is used in the genetic engineering of plants?
a. Acetobacter b. Lactobacillus
c. Agrobacterium d. Saccharomyces

103. Bt cotton is a genetically modified cotton variety containing genes from the bacteria called Bacillus thuringiensis. Which of the following statements is incorrect regarding Bt cotton?
a. It is resistant to the attack of crop pests.
b. It helps in decreasing the use of pesticides on the field
c. It can cause genetic pollution in the wild cotton variety
d. It can increase the population of beneficial insets on the field.

104. Production of insulin using bacteria has helped diabetic patients throughout the world. Which of the following methods is used for producing insulin from bacteria?
a. Recombinant DNA technology
b. Polymerase chain reaction
c. Organ transplantation
d. Enzymatic digestion

105. The information in which alternative is in correctly matched?
a. Medulla oblongata – lower half of brainstem
b. Arbar vitae – Core of white matter
c. Conus medullaris – Lower end of spinal cord
d. Cornea – coloured part of eye.

106. Over activity of which hormone causes Cushing's syndrome ?
a. Cortisol b. Oxytocin
c. Aldosterone d. Thyroxine

107. How do contraceptive oral pills help in birth control?
a. Phagocytose the sperms
b. Suppress the motility of sperms
c. Prevent ovulation
d. Suppress the fertilising capacity of sperms.

108. The coding strand of transcriptional unit start with sequences AGTCTAAG CTGAGGACT. Which of the following sequences represents the mRNA transcribed from this transcriptional unit?
a. AGUCUAAGCUGAGACU
b. UCAGAUUCGACUCUGA
c. AGUCUAACGACUGACU
d. AGTCTAAGCTGAGACT

109. Which of the following statements regrading C_4 pathway is false?

a. The primary CO_2 acceptor is phosphoenol pyruvate
b. The enzyme responsible for CO_2 fixation is PEP case
c. The mesophyll cells lack RuBisCO enzyme
d. The bundle sheath cells contain the enzyme PEP case.

110. One hormone is used to speed up the mating process in barley, another is used to promote flowering in pineapple, while the third helped in the delay of leaf senescence. These are respectively.
a. Auxin, Gibberellin and cytokinin
b. Gibberellin, Cytokinin and Auxin
c. Gibberellin, Auxin and Cytokinin
d. Cytokinin, Auxin and Gibberellin.

111. Select incorrect statement w.r.t. chemiosmotic hypothesis
a. Based on related proton gradient
b. Number of proton (H^+) required for ATP generation is same in chloroplast and mitochondria
c. ATPase enzyme conformational change generates several molecules of energy packed ATP.
d. Proton move through facilitated diffusion

112. During fixation of 2 molecules of nitrogen (N_2), how many ATP and how many ammonia will be required and produced respectively?
a. 32 and 2 b. 16 and 2
c. 32 and 4 d. 64 and 8

113. Water flows into the cell and out of the cell and are in equilibrium too when the cells are placed in
a. Hypertonic solution b. Isotonic solution
c. Hypotonic solution d. Pure water

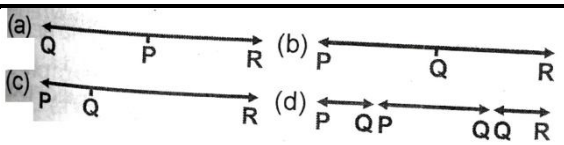
114. Bohr's effect is related with
a. reduced carbon level in lymph
b. increased carbon dioxide level in blood
c. oxidised phosphorus level in blood
d. reduced carbon dioxide level in blood

115. which of the following holds true for SA node?
a. It is called pacesetter.
b. It is regulated by the cardiac centers present in medulla oblongata of brain.
c. It has very low rhythmicity
d. It is present in the left atrium near the opening of superior vena cava.

116. Which of the following statements about enzymes are correct?
(i). Enzymes do not alter the overall change in the free energy for a reaction.
(ii). Enzymes speed up reactions by lowering activation energy.
(iii). Enzymes speed up reactions by lowering activation energy.
(iv). Enzymes are highly specific for reactions
(v). The energy input needed to start a chemical reaction is called activation energy.
a. (i) & (v) (b). (ii) and (iv)
c. (i), (ii) & (iv) (d). All of these

117. Which of the following is a connecting link between Phylum Annelida and Mollusca?
a. Peripatus b. Proterospongia
c. Balanoglossus d. Neophilina

118. If map distance between genes P and A is 3 units between P and R is 9 units, and between Q and R us 6 units, the order of genes on the linkage map can be traced as follow.



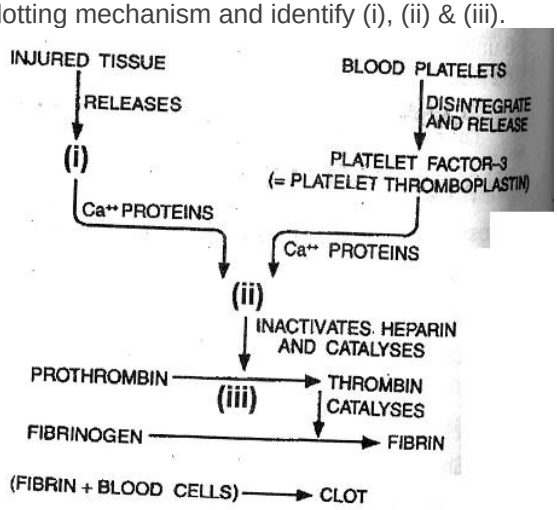
119. Which of the following method involves transformation of host cell by inducing pores in plasma membrane through electrical impulse using $CaCl_2$?
a. Microinjection b. Biolistic method
c. Electroporation d. Direct DNA injection

120. Acoustic zoning is a control measure for?
a. air pollution b. noise pollution
c. water pollution d. radiation pollution

121. On exposure to a chemical mutagen, adenine is replaced by thymine, in a DNA segment. It is the case of
a. inversion b. transition
c. transversion d. insertion

122. Emasculation is not required in case of _____ flowers for performing artificial hybridisation.
a. pea b. papaya
c. mustard d. rice

123. Refer to the given flow chart showing the blood clotting mechanism and identify (i), (ii) & (iii).



a. (i). Prothrombinase, (ii) Thromboplastin, (iii) Mg^{2+}
b. (i) Thromboplastin, (ii) Prothrombinase, (iii) Zn^{2+}
c. (i) Thromboplastin,(ii). Prothrombinase, (iii) Ca^{2+}
d. (i) Prothrombinase,(ii) Thromboplastin, (iii) Fe^{2+}

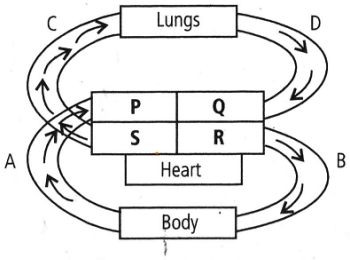
124. Dikaryon stage during sexual reproduction occurs in
a. Mycoplasma b. Puccinia
c. Marchantia d. Pseudomonas.

125. Gymnosperms are referred to as "naked seeded plants", because
(a) they lack ovule
(b) they lack ovaries
(c) they have no seed coat
(d) the embryo is unprotected.

126. The organic substance present in mesophyll cells are passed into the sieve tubes through their companion cells by
(a) an active transport
(b) simple diffusion
(c) facilitated diffusion
(d) osmosis.

127. Which enzyme of TCA/Krebs' cycle is not present in mitochondrial matrix?
(a) Malate dehydrogenase
(b) Citrate synthase
(c) Aconitase
(d) Succinate dehydrogenase

128. Which statement is correct for the given diagram?



(i) Q receives oxygenated blood from lungs through pulmonary artery.
(ii) Vena cava A carries deoxygenated blood to right atrium P.
(iii) Carotid artery B transports oxygenated blood from left ventricle R to different body tissues.
(iv) Pulmonary artery C carries carbon dioxide rich blood from right ventricle S to lungs.

(a) (iii) only (b) (ii) and (iv)
(c) (i), (iii) and (iv) (d) (i), (ii) and (iii)

129. Muscles with characteristic striations and voluntary are
(a) muscles in the intestine
(b) muscles of the heart
(c) muscles in stomach
(d) muscles in pharynx.

130. Which hormone promotes synthesis of carbohydrates from non-carbohydrates and stimulates degradation of proteins?
(a) Calcitonin (b) Cortisone
(c) Corticosterone (d) Cortisol

131. Which among the following is an inverted pyramid?
(a) Pyramid of energy in grassland
(b) Pyramid of number in pond ecosystem
(c) Pyramid of number in grassland
(d) Pyramid of biomass in an aquatic system

132. The following cell organelle takes part in disappearance of larval organs in frogs during metamorphosis

a. Vacuoles

b. Lysosomes

c. Ribosomes

d. Microfilament

133. Which hormone along these is not secreted by an endocrine gland?

a. ADH b. ANF

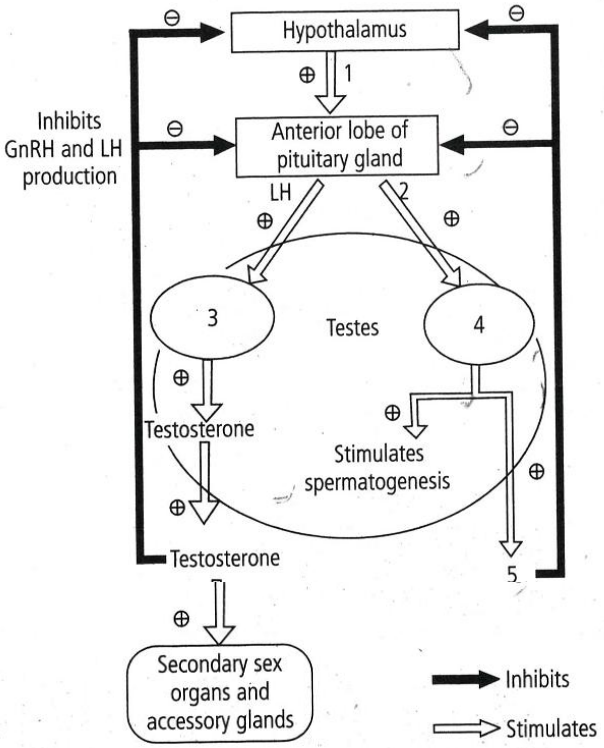
c. T4 d. PTH

134. Match column I with column II and select the correct option.

Column I	Column II
1. Golden rice	p. Human alpha lactalbumin
2. α-1 antitrypsin	q. *Cry I Ab*
3. Bt corn	r. Vitamin A
4. Rosie	s. Emphysema

(a) 1-s, 2-p, 3-r, 4-q (b) 1-r, 2-s, 3-q, 4-p
(c) 1-q, 2-r, 3-p, 4-s (d) 1-q, 2-s, 3-p, 4-r

135. Identify labels 1-5 in the given flow chart showing hormonal control of male reproductive system and select the correct option.



(a) 1-FSH, 3-Leydig's cells, 4-Sertoli cells
(b) 1-GnRH, 3-Interstitial cells, 5-Inhibin
(c) 2 GnRH, 4-Leydig's cells, 5-Androgen binding protein
(d) 1-GnRH, 2-Androgen binding protein, 4-Seminiferous tubule.

136. Read the given statements.
(i) In prokaryotes, the photosynthetic pigments are found in the _____.
(ii) NAA and 2,4-D are _____ auxins.
Select the correct option which correctly fills the two blanks.

	(i)	(ii)
(a)	Thylakoid	Synthetic
(b)	Chloroplast	Synthetic
(c)	Thylakoid	Natural
(d)	Chloroplast	Natural

137. The sequential events in the sexual reproduction may be grouped into
(a) Two stages – gametogenesis and gamete transfer
(b) Three stages – gametogenesis and gamete transfer and fertilisation
(c) Two stages – gametogenesis and embryogenesis
(d) Three stages – pre fertilisation, fertilisation and post fertilisation events.

138. In which of the following, all listed genera belong to the same class of algae?
(a) *Chara, Fucus, Polysiphonia*
(b) *Volvox, Spirogyra, Chlamydomonas*
(c) *Porphyra, Ectocarpus, Ulothrix*
(d) *Sargassum, Laminaria, Gracilaria*

139. Inulin is a polymer of
(a) sucrose (b) fructose
(c) glucose (d) galactose.

140. Which of the following is correctly matched?
(a) *Obelia* - Diploblastic - Biradial symmetry
(b) *Palaemon* - Pseudocoelomate - Book gills
(c) *Carcharodon* - Cartilaginous fish - Internal fertilisation
(d) *Ctenoplana* - Eucoelomate - Connecting link

141. Choose the correct statements.
I. Dedifferentiated cells are differentiated cells which revert to undifferentiated state to take over the function of division.
II. In gram –ve bacteria, murein content is 30-40%.
III. The ratio of A + T/G + C in eukaryotic cell is <1.
IV. Cell wall prevents bursting of plant cells by inhibiting excessive endosmosis.
(a) I and IV (b) II, III and IV
(c) I and III (d) I, III and IV

142. Order of toxicity among nitrogenous waste products from higher to lower is
(a) uric acid < urea < ammonia
(b) uric acid < ammonia < urea
(c) urea < uric acid < ammonia
(d) ammonia > urea > uric acid.

143. Which of the following is a correctly matched pair?
(a) Hypothalamus – Urge for eating and drinking
(b) Nissl's granules – Dendrites
(c) Pia mater – Outer layer
(d) Bipolar neuron – Embryonic stage

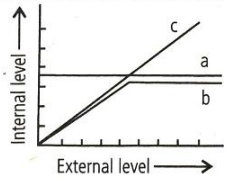
144. Which of the following statements is correct?
(a) Relaxin hormone is secreted by follicular cells.
(b) During spermatogenesis, type A spermatogonia are the precursors of sperms.
(c) Menstrual phase is caused by increase in progesterone and estrogen.
(d) Placental hormone hCS stimulates the growth of mammary glands during pregnancy.

145 Of the above given differences
(a) Only (i) and (ii) are correct
(b) Only (i) and (iii) are correct
(c) Only (ii) and (iv) are correct
(d) Only (i), (iii) and (iv) are correct.

146. Study the given table.

	Biomagnification	Eutrophication
(i)	It is the increase in concentration of non-biodegradable substance in the food chain.	It is the enrichment of the water body with plant nutrients.
(ii)	It is found in terrestrial ecosystem only.	It is found in oceans only.
(iii)	It does not result in organic loading.	It leads to organic loading.
(iv)	It leads to toxicity in higher order consumers.	It leads to toxicity in low order consumers.

147. Refer to the given graph and select the incorrect statement.
(a) Birds and mammals belong to category 'a'.
(b) Animals in category 'b' always maintain constant internal environment.
(c) Osmotic concentration of animals in category 'c' changes according to ambient conditions.
(d) Animals of category 'a' shows suspended development during unfavourable conditions.



148. Substrates which have R.Q. less than one are
(a) proteins only (b) fats and proteins
(c) carbohydrates and fats (d) carbohydrates only.

149. Oestrus cycle is seen in
(a) cow and sheep (b) rat and deer
(c) dogs and tiger (d) all of these.

150. Match the column I with column II and select the correct option from the codes given below

Column - I (Fungus name)	Column - II (Commonly called)
A. *Puccinia*	(i) Yeast
B. *Ustilago*	(ii) Mushroom
C. *Agaricus*	(iii) Smut fungus
D. *Saccharomyces*	(iv) Rust fungus

(a) A-(i), B-(iii), C-(iv), D-(ii)
(b) A-(iii), B-(i), C-(ii), D-(iv)
(c) A-(iii), B-(i), C-(iv), D-(ii)
(d) A-(iv), B-(iii), C-(ii), D-(i)

151. Which of these is not a function of Golgi apparatus?
(a) Site of synthesis of glycoproteins and glycolipids
(b) Secretion
(c) Membrane transformation
(d) Site of protein synthesis

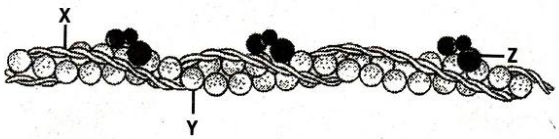
152. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. TCA cycle	(i) Inner mitochondrial membrane
B. $F_0 - F_1$ particles	(ii) Aerobic respiration
C. End product of glycolysis	(iii) Oxidative decarboxylation
D. Pyruvate dehydrogenase	(iv) Pyruvic acid

(a) A-(ii), B-(i), C-(iv), D-(iii)
(b) A-(i), B-(ii), C-(iv), D-(iii)
(c) A-(ii), B-(iii), C-(iv), D-(i)
(d) A-(iii), B-(ii), C-(i), D-(iv)

153. Bicarpellary syncarpous gynoecium is not found in the flowers of
(a) *Atropa belladonna* (b) *Solanum tuberosum*
(c) *Petunia* (d) *Colchicum autumnale*.

154. Study the following diagram and select the correct option for X, Y and Z.



X	Y	Z
(a) F-actin	Troponin	Tropomyosin
(b) Troponin	Tropomyosin	F-actin
(c) Tropomyosin	Troponin	F-actin
(d) Tropomyosin	F-actin	Troponin

155. Which of these animals has three chambered heart, cloaca and respires by gills, lungs and through skin?

(a)  (b)  (c)  (d) 

156. The first heart sound (lub) is associated with
(a) closure of tricuspid and bicuspid valves
(b) closure of semilunar valves
(c) opening of tricuspid and bicuspid valve
(d) opening of SAN.

157. Site of absorption of monosaccharides, amino acids, fatty acids, glycerol and vitamins is
(a) stomach (b) duodenum
(c) jejunum (d) ileum.

158. Match column I with column II and select the correct option.

Column I	Column II
A. Calcitonin	1. Gonadotropin
B. Aldosterone	2. Growth inhibiting hormone
C. Luteinising hormone	3. Thyroid hormone
D. Somatostatin	4. Salt retaining hormone
	5. Regulates blood calcium level.
	6. Controls ovulation
	7. Hypothalamus
	8. Mineralocorticoid

(a) A-3, 5; B-4, 8; C-1,6; D-2, 7
(b) A-3, 5; B-4, 6; C-2,8; D-1, 7
(c) A-4, 7; B-3, 6; C-2,5; D-1, 8
(d) A-1, 5; B-2, 6; C-3,8; D-4, 7

159. Which of the following cloning vectors can be used for cloning DNA fragments upto 45 Kb in length?
(a) Cosmids (b) BAC
(c) Phagemids (d) YAC

160. Select the option which clearly differentiates phellem from phelloderm.

	Phellem	Phelloderm
(a)	It is formed on the innerside of phellogen	It is formed on the outerside of phellogen.
(b)	It is made up of living cells.	It is made up of dead cells.
(c)	Its cells store the food.	It is protective in function.
(d)	Suberisation is present.	Suberisation is absent.

161. Read the differences between chlorophyll *a* and chlorophyll *b*.

	Chlorophyll *a*	Chlorophyll *b*
(i)	Its formula is $C_{55}H_{72}O_5N_4Mg$.	Its formula is $C_{55}H_{70}O_6N_4Mg$.
(ii)	It is an accessory photosynthetic pigment.	It is a primary photosynthetic pigment.
(iii)	Carbon-3 contains aldehyde (–CHO) group.	Carbon-3 contains methyl ($-CH_3$) group.
(iv)	It is soluble in petroleum ether.	It is soluble in 92% methyl alcohol.

Of the above differences
(a) Only (i) and (ii) are correct
(b) Only (iii) and (iv) are correct
(c) Only (i) and (iv) are correct
(d) Only (ii) and (iii) are correct.

162. Which of the following amino acids play an important role in ornithine cycle?
(a) Glycine and methionine
(b) Arginine and methionine
(c) Ornithine and citrulline
(d) Citrulline and glycine

163. Identify the correct sequence of various steps involved in MOET.
(i) Cow produces 6-8 eggs.
(ii) Cow is artificially inseminated.
(iii) Cow is administered with FSH like hormone.
(iv) Embryos at 8-32 celled stage are collected and transferred to surrogate mothers.
(a) (iii) → (ii) → (i) → (iv)
(b) (iii) → (i) → (ii) → (iv)
(c) (i) → (iii) → (ii) → (iv)
(d) (ii) → (iii) → (i) → (iv)

164. The double stranded DNA has 15% of cytosine. The percentage of adenine in DNA will be
(a) 35% (b) 30%
(c) 45% (d) 70%.

165. Nucellar embryo is
(a) amphimictic haploid (b) amphimictic diploid
(c) apomictic haploid (d) apomictic diploid.

166 Interaction between _____ and certain environmental factors regulate the reproductive processes and the associated behavioural expression of organisms.
(a) enzymes (b) hormones
(c) vitamins (d) all of these

167 Read the given statements and select the correct option.
Statement A : *Lacerta saxicola armeniaca* does not show biparental sexual reproduction.
Statement B : *Lacerta saxicola armeniaca* reproduces exclusively by parthenogenesis.
(a) Both statements A and B are incorrect.
(b) Both statements A and B are correct.
(c) Statement A is correct but statement B is incorrect.
(d) Statement A is incorrect but statement B is correct.

168 Which of the following processes is helped by bile salts?
(a) Nucleic acid $\xrightarrow{\text{Nuclease}}$ Nucleotides $\xrightarrow{\text{Nucleotidase}}$ Nucleosides $\xrightarrow{\text{Nucleosidase}}$ Sugar + bases
(b) Sucrose $\xrightarrow{\text{Sucrase}}$ Glucose + Fructose
(c) Fats $\xrightarrow{\text{Lipase}}$ Diglycerides $\longrightarrow$ Monoglycerides
(d) Proteins, Peptones, Proteoses $\xrightarrow[\text{Carboxypeptidase}]{\text{Trypsin/Chymotrypsin}}$ Dipeptides

169. Number of fatty acid tails present in a molecule of phospholipid is
(a) two (b) three
(c) one (d) none of these.

170. Read the given statements and select the correct option.
Statement I : Ornithophilous flowers are generally dull coloured with strong fermenting or fruity odour, abundant nectar and pollen grains.
Statement II : Ornithophily is cross pollination performed by insects.
(a) Statements I and II are correct.
(b) Statements I and II are incorrect.
(c) Statement I is correct but Statement II is incorrect.
(d) Statement I is incorrect but statement II is correct.

171. During movement of fresh air into lungs
(a) external intercostal muscles contract
(b) diaphragm relaxes and becomes dome shaped
(c) abdominal muscles contract
(d) both (a) and (c).

172. Most abundant mineral element in muscles is
(a) calcium (b) potassium
(c) phosphorus (d) magnesium.

173. Chilled ethanol is added during DNA isolation because
(a) it breaks open the cell to release DNA
(b) it is used to remove RNA and proteins
(c) it precipitates purified DNA
(d) it stabilises single stranded DNA.

174. Devernalisation occurs when
(a) low temperature is followed by high temperature
(b) low temperature is maintained for longer duration
(c) high temperature is followed by low temperature
(d) none of these.

175. Which of the following pairs is incorrectly matched?
(a) Kinetin – adenine derivative
(b) Gibberellin – terpenes
(c) Ethylene – gases
(d) ABA – indole compounds

176. Darwin's finches are an example of
(a) adaptive radiation (b) restricted distribution
(c) convergent evolution
(d) discontinuous distribution of closely related species.

177. Match the following and select the correct option.

(i) *Physalia*	A. Sea anemone
(ii) *Meandrina*	B. Brain coral
(iii) *Gorgonia*	C. Sea fan
(iv) *Adamsia*	D. Portuguese man-of-war

(a) (i)-C; (ii)-B; (iii)-A; (iv)-D
(b) (i)-D; (ii)-C; (iii)-B; (iv)-A
(c) (i)-D; (ii)-B; (iii)-C; (iv)-A
(d) (i)-B; (ii)-C; (iii)-A; (iv)-D

178. Which of the following statements is incorrect?
(a) The intestinal mucosa has brush-bordered absorptive columnar epithelium.
(b) Mammary glands are merocrine glands, which accumulate secretory products in apical part.
(c) Tendons which connect muscles with bones are white fibrous connective tissues.
(d) Eustachian tube is lined with ciliated columnar epithelium.

179. Lungs contain about 2100 mL of air after a normal expiration. If residual volume of lungs is about 1100 mL, then amount of air that can be expired forcibly after normal expiration is
(a) 3200 mL (b) 1100 mL
(c) 1000 mL (d) none of these.

180. Read the given statements and select the correct option.
Statement A : During external respiration, oxygen passes from alveoli into the blood.
Statement B : pO_2 in alveolar air is 104 mmHg while pO_2 in deoxygenated blood is 40mmHg.
(a) Both statements A and B are correct.
(b) Both statements A and B are incorrect.
(c) Statement A is correct but statement B is incorrect.
(d) Statement A is incorrect but statement B is correct.