BIOLOGY

91. In angiosperms, root hairs arise from which one of the following regions of the root?
(1) The root cap zone
(2) The region of meristematic activity
(3) The region of elongation
(4) The region of maturation
Answer (4)

92. In which one of the following, the ovules are ***not*** enclosed by an ovary wall and remain exposed?
(1) *Funaria*
(2) *Pinus*
(3) *Selaginella*
(4) *Wolffia*
Answer (2)

93. In the *lac* operon, the *z* gene codes for
(1) permease
(2) transacetylase
(3) beta-galactosidase
(4) the repressor of *lac* operon
Answer (3)

94. Exploring molecular, genetic and species-level diversity for products of economic importance is called
(1) Biofortification
(2) Bioremediation
(3) Bioprospecting
(4) Biomagnification
Answer (3)

95. Match List I with List II:

	List-I		List-II
A.	Genetically modified organism	(I)	*Agrobacterium tumefaciens*
B.	Thermostable DNA polymerase	(II)	Bt cotton
C.	Ti plasmid	(III)	*Thermus aquaticus*
D.	pBR322	(IV)	*Escherichia coli*

Choose the **correct** answer from the options given below:
(1) A-II, B-III, C-I, D-IV
(2) A-II, B-I, C-IV, D-III
(3) A-I, B-IV, C-III, D-II
(4) A-I, B-II, C-IV, D-III
Answer (1)

96. Match List I with List II :

	List I		List II
A.	Productivity	I.	Gross primary productivity minus respiration losses
B.	Net primary productivity	II.	Rate of formation of new organic matter by consumers
C.	Gross primary productivity	III.	Rate of biomass production
D.	Secondary productivity	IV.	Rate of production of organic matter during photosynthesis

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

(1) A-III, B-I, C-IV, D-II

(2) A-I, B-II, C-III, D-IV

(3) A-I, B-III, C-IV, D-II

(4) A-III, B-I, C-II, D-IV

Answer (1)

97. Since the origin and diversification of life on Earth, there have been five episodes of mass extinction of species. How is the sixth extinction, which is in progress, different from the previous episodes?

(1) The present net species extinction rate is zero.

(2) The current species extinction rate is nearly 10 times faster than in previous episodes.

(3) The present species extinction rates are 100 to 1000 times faster than in the pre-human times.

(4) The current species extinction rates are far lower than those in previous spisodes.

Answer (3)

98. Alpha-helix is found in which level of protein structure?

(1) Secondary structure

(2) Tertiary structure

(3) Primary structure

(4) Quaternary structure

Answer (1)

99. The main function of bulliform cells in grasses is :

(1) to make the leaf impermeable to fungal spores.

(2) to transport water.

(3) to perform photosynthesis.

(4) to minimize water loss during water stress.

Answer (4)

100. Identify the **correct** sequence of steps in each cycle of Polymerase Chain Reaction :

(1) Extension → Annealing → Denaturation

(2) Annealing → Denaturation → Extension

(3) Denaturation → Extension → Annealing

(4) Denaturation → Annealing → Extension

Answer (4)

101. Match List I with List II :

	List-I (Phases of cell cycle)		**List-II (Activity)**
A.	G_1 phase	I.	Actual cell division occurs
B.	S phase	II.	Cell is metabolically active and continuously grows but does not replicate its DNA
C.	G_2 Phase	III.	Synthesis of DNA occurs and the amount of DNA per cell doubles
D.	M phase	IV.	Proteins are synthesized while cell growth continues

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-III, B-IV, C-I, D-II

(4) A-II, B-III, C-IV, D-I

Answer (4)

102. Which of the following statements are correct?

A. The Amazone rainforest being cut and cleared for cultivation of soyabeans is an example of habitat loss.

B. Steller's sea cow and passenger pigeon became extinct due to over-exploitation by humans.

C. The Nile perch introduced into Lake Victoria in East Africa helped in population growth of cichlid fish in the lake.

D. Water hyacinth is an invasive species.

E. When a species becomes extinct, the plant and animal species associated with it are not affected.

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

(1) A, B and E only

(2) A, B and D only

(3) C, D and E only

(4) B, C and D only

Answer (2)

103. Which of the following statements are correct with reference to a transcription unit?

A. A transcription unit in DNA is defined primarily by three regions : promoter, structural gene and terminator.

B. The promoter is said to be located towards the 5′-end of the structural gene.

C. The promoter is a DNA sequence that provides binding site for RNA polymerase.

D. The promoter defines the template and coding strands.

E. The terminator is located towards the 3′-end of the coding strand and it defines the end of the process of transcription.

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

(1) A, B, C and D only

(2) A, C, D and E only

(3) B, C, D and E only

(4) A, B, C , D and E

Answer (4)

104. Which one of the following statements is *not* true about the universal rules of binomial nomenclature?

(1) Biological names are generally in Latin

(2) Both the words in a biological name, when handwritten, are separately underlined or printed in italics

(3) The specific epithet in the biologial name starts with a small letter

(4) The first word in the biological name represents the specific epithet, while the second component denotes the genus

Answer (4)

105. Match List I with List II:

	List-I		**List-II**
A.	Decomposition	I.	Accumulation of dark coloured amorphous colloidal substance
B.	Detritus	II.	Release of inorganic nutrients by the activity of microbes in soil
C.	Mineralisation	III.	Breaking down of complex organic matter into inorganic substances.
D	Humification	IV.	Dead remains of plants and animals including fecal matter

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

(1) A-IV, B-III, C-I, D-II

(2) A-III, B-IV, C-II, D-I

(3) A-I, B-II, C-III, D-IV

(4) A-III, B-II, C-I, D-IV

Answer (2)

106. Which one of the following is the site for active ribosomal RNA synthesis?

(1) Centrosome

(2) Chromatin

(3) Nucleolus

(4) Kinetochore

Answer (3)

107. $2(C_{51}H_{98}C_6) + 145\ O_2 \rightarrow$

$102\ CO_2 + 98\ H_2O$ + energy

The Respiratory Quotient (RQ) of a biomolecule used for respiration, as per the above equation would be :

(1) Between 0.5 and 0.95

(2) Less than 0.5

(3) 1.0

(4) Between 1.25 and 2

Answer (1)

108. Match List I with List II :

	List-I		List-II
A.	Incomplete dominance	I.	Human skin colour
B.	Co-dominance	II.	Inheritance of flower colour in *Antirrhinum* sp.
C.	Pleiotropy	III.	Phenylketonuria disease in humans
D.	Polygenic inheritance	IV.	ABO blood groups

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-I, B-IV, C-III, D-II

(4) A-II, B-I, C-III, D-IV

Answer (1)

109. Arrange the following steps of DNA fingerprinting in a correct sequence.

A. Isolation of DNA and its digestion by restriction endonucleases.

B. Hybridisation using a labelled VNTR probe.

C. Transferring of separated DNA fragments to synthetic membranes.

D. Detection of hybridised DNA fragments by autoradiography.

E. Separation of DNA fragments by electrophoresis.

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

(1) A, B, D, C, E

(2) A, D, B, E, C

(3) A, E, C, B, D

(4) A, E, B, C, D

Answer (3)

110. Which of the following statements are correct with reference to packaging of DNA helix ?

A. Histones are organized to form a unit of eight molecules called histone octamer.

B. Histones are negatively charged basic proteins.

C. Histones are rich in the basic amino acid residues - lysine and arginine.

D. The positively charged DNA is wrapped around the histone octamer to form nucleosome.

E. The packaging of chromatin at higher levels requires an additional set of proteins called non-histone chromosomal proteins.

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

(1) A, C and E only

(2) B, D and E only

(3) C, D and E only

(4) A, B and D only

Answer (1)

111. Find the **incorrect** statement(s) about photosynthesis from the following:

A. The water splitting complex is associated with PS I.

B. C_4 plants use the C_3 pathway of CO_2 fixation as the main biosynthetic pathway.

C. In C_4 plants, photorespiration does not occur.

D. C_3 plants exhibit 'Kranz' anatomy.

E. ATP synthesis in chloroplast occurs through chemiosmosis.

Choose the answer from the options given below:

(1) B and C only

(2) B only

(3) B and E only

(4) A and D only

Answer (4)

112. Arrange the following steps of somatic hybridisation in a correct sequence.

A. Digestion of cell walls.

B. Isolation of naked protoplasts.

C. Fusion of protoplasts to get hybrid protoplast.

D. Isolation of single cells from two different varieites of plants.

E. Growing of hybrid protoplast to form a new plant.

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

(1) D, A, B, C, E

(2) E, B, A, D, C

(3) D, B, A, E, C

(4) E, A, B, C, D

Answer (1)

113. Match List-I with List-II :

	List-I		List-II
A.	Conjunctive tissue	I.	Specialised cells in the vicinity of guard cells
B.	Casparian strips	II.	Endodermal cells rich in starch
C.	Subsidiary cells	III.	Tissue between xylem and phloem
D	Starch sheath	IV.	Endodermal cells with suberin deposition

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

(1) A-IV, B-III, C-I, D-II

(2) A-III, B-IV, C-II, D-I

(3) A-III, B-IV, C-I, D-II

(4) A-IV, B-III, C-II, D-I

Answer (3)

114. Which one of the following is ***not*** a characteristic of plant cells in the phase of elongation?

(1) New cell wall deposition

(2) Cell enlargement

(3) Increased vacuolation

(4) Large conspicuous nuclei

Answer (4)

115. Match List-I with List-II

	List-I (Growth Regulator)		List-II (Function/Effect)
A.	2,4-D	I.	Brewing industry
B.	GA_3	II.	Stimulation of stomatal closure
C.	Kinetin	III.	Herbicide
D.	ABA	IV.	Nutrient mobilisation

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

(1) A-III, B-I, C-IV, D-II

(2) A-IV, B-III, C-II, D-I

(3) A-I, B-IV, C-III, D-II

(4) A-I, B-II, C-IV, D-III

Answer (1)

116. The enzyme required for carboxylation in the Calvin cycle is

(1) Hexokinase

(2) PEP carboxylase

(3) RuBP carboxylase - oxygenase

(4) Carboxypeptidase

Answer (3)

117. How many ATP and NADPH molecules are required to make one molecule of glucose through the Calvin pathway?

(1) 18 ATP and 12 NADPH

(2) 12 ATP and 18 NADPH

(3) 24 ATP and 18 NADPH

(4) 6 ATP and 12 NADPH

Answer (1)

118. Which of the following floral formula is the correct floral formula of Solanaceae family?

(1) $\oplus\ \female\ K_{(5)}C_{(5)}A_5\underline{G}_{(2)}$

(2) $\oplus\ \female\ K_{(5)}\overset{\frown}{C_{(5)}A_5}\underline{G}_{(2)}$

(3) $\oplus\ \female\ K_5\ C_5\ A_5\underline{G}_{(2)}$

(4) $\oplus\ \female\ K_5\ \overset{\frown}{C_{(5)}A_5}\underline{G}_{(2)}$

Answer (2)

119. Which of the following is an *in situ* conservation method?

(1) Sacred Groves

(2) Wildlife Safari Parks

(3) Botanical Gardens

(4) Seed Banks

Answer (1)

120. Which of the following statements are **not** true regarding restriction endonucleases?

A. They are called molecular scissors.

B. These are the enzymes responsible for restricting the growth of bacteriophages in *E. coli.*

C. They cut the DNA only at the centre of the palindromic sites.

D. They remove nucleotides only from the ends of DNA fragments.

E. They recognise specific palindromic base-pair sequences.

Choose the answer from the options given below :

(1) A and B only

(2) A and E only

(3) D and E only

(4) C and D only

Answer (4)

121. In racemose inflorescence, _____.

(1) The main axis terminates in a flower

(2) Flowers are solitary

(3) The growth is limited

(4) Flowers are borne in an acropetal succession

Answer (4)

122. Arrange the following in the correct developmental sequence related to microsporogenesis :

A. Microspore tetrads

B. Sporogenous tissue

C. Pollen grains

D. Pollen mother cells

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

(1) D, A, C, B

(2) B, D, A, C

(3) B, D, C, A

(4) A, D, C, B

Answer (2)

123. Identify the correct statements about biomolecules.

A. Lipids are generally water soluble.

B. Proteins are polypeptides.

C. Polysaccharides are long chains of sugars.

D. Adenine and guanine are substituted pyrimidines.

E. Almost all enzymes are proteins.

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

(1) B, D and E only

(2) B, C and E only

(3) A, B and C only

(4) C, D and E only

Answer (2)

124. Which of the following statements are true with reference to the sex-determination in honeybees?

A. An offspring formed from the union of a sperm and an egg, develops as a female (queen or worker).

B. An unfertilized egg develops as a male by parthenogenesis.

C. A male has half the number of chromosomes than that of a female.

D. Males produce sperms by meiosis.

E. Honeybees have a haplodiploid sex-determination system.

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

(1) A, B, C and E only

(2) B, C, D and E only

(3) A, B, C and D only

(4) A, B, D and E only

Answer (1)

125. Heterophyllous development in response to environment is an example of which of the following phenomena?

(1) Redifferentiation

(2) Elasticity

(3) Dedifferentiation

(4) Plasticity

Answer (4)

126. Which of the following statements are correct regarding amino acids?

A. They are substituted methanes.

B. Serine is an aromatic amino acid.

C. Valine is a neutral amino acid.

D. Lysine is an acidic amino acid.

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

(1) C and D only

(2) B and C only

(3) A and C only

(4) A and B only

Answer (3)

127. "The Evil Quartet" of biodiversity loss includes which of the following?

(1) Over-exploitation; Alien species invasions; Air pollution; Co-extinctions

(2) Habitat loss and fragmentation; Air pollution; Water pollution; Co-extinctions

(3) Habitat loss and fragmentation; over-exploitation; Alien species invasions; Co-extinctions

(4) Over-exploitation; Alien species invasions; Soil pollution; Co-extinctions

Answer (3)

128. Match **List-I** with List-II:

	List-I (Process)		**List-II (Location)**
A.	Glycolysis	I.	Inner mitochondrial membrane
B.	ETS	II.	Mitochondrial matrix
C.	Accumulation of protons	III.	Cytoplasm
D.	Krebs' cycle	IV.	Intermembrane space

Choose the correct answer from the options given below:

(1) A-IV, B-II, C-I, D-III

(2) A-II, B-III, C-IV, D-I

(3) A-III, B-I, C-IV, D-II

(4) A-I, B-IV, C-III, D-II

Answer (3)

129. Which one of the following is a triploid cell?

(1) Synergid

(2) Central cell

(3) Zygote

(4) Primary endosperm cell

Answer (4)

130. Which one of the following types of pollination brings genetically different types of pollen grains to the stigma?

(1) Autogamy

(2) Xenogamy

(3) Geitonogamy

(4) Cleistogamy

Answer (2)

131. Match List I with List II :

	List I (Placentation)		**List II (Example)**
A.	Marginal	I.	Mustard
B.	Axile	II.	Pea
C.	Parietal	III.	Marigold
D.	Basal	IV.	Lemon

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

(1) A-II, B-IV. C-I, D-III

(2) A-I, B-III. C-II, D-IV

(3) A-III, B-I. C-IV, D-II

(4) A-IV, B-II. C-I, D-III

Answer (1)

132. The main criteria used for Five Kingdom Classification proposed By R.H. Whittaker (1969) included :

A. Cell structure

B. Body organization

C. Presence of flagellum

D. Reproduction

E. Phylogenetic relationships

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

(1) A, B, C, D, and E

(2) B, C, and D only

(3) A, B, D, and E only

(4) A, B, and E only

Answer (3)

133. Match List I with List II :

	List I		List II
A.	Trypsin	I.	Intercellular ground substance
B.	Morphine	II.	Lectin
C.	Concanavalin A	III.	Enzyme
D.	Collagen	IV.	Alkaloid

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

(1) A-III, B-IV. C-II, 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

Answer (1)

134. Which of the following statements are correct with respect to DNA separation, isolation and visualization?

A. The cutting DNA is done by molecular scissors.

B. The DNA fragments separate according to their size in an agarose gel, upon electrophoresis.

C. The separated DNA fragments can be seen without staining when exposed to UV light.

D. The separated DNA fragments, when stained with ethidium bromide, can be seen in visible light.

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

(1) B and D only

(2) A and B only

(3) B and C only

(4) A and D only

Answer (2)

135. Which one of the following disorders is caused by the substitution of Glutamic acid (Glu) by Valine (Val) at the sixth position of the beta globin chain of the haemoglobin molecule?

(1) Thalassemia

(2) Sickle-cell anaemia

(3) Phenylketonuria

(4) Haemophilia

Answer (2)

136. Match List I with List II:

	List-I		List-II
a.	Cortisol	I.	Stimulates the formation of alveoli in mammary glands
b.	Aldosterone	II.	Produces anti-inflammatory reactions
c.	Cholecystokinin	III.	Stimulates reabsorption of Na^+ and water from renal tubule
d	Progesterone	IV.	Stimulates secretion of pancreatic enzymes and bile juice

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-III, C-IV, D-I (4) A-II, B-III, C-I, D-IV

Answer (3)

137. Arrange the following events occuring in Renin-Angiotensin mechanism in the correct order:

A. Increase in blood pressure and Glomerular filtration rate

B. Reabsorption of Na^+ and water from distal parts of tubule due to Aldosterone

C. Fall in Glomerular filtration rate

D. Vasoconstriction by Angiotensin II and release of Aldosterone.

E. Renin converts Angiotensinogen into Angiotensin I, followed by Angiotensin II.

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

(1) A, C, E, B, D (2) C, A, B, D, E

(3) A, D, B, E, C (4) C, E, D, B, A

Answer (4)

138. In humans, respiration occurs in the following steps. Arrange these steps in the correct order.

A. Diffusion of O_2 and CO_2 between blood and tissues

B. Diffusion of O_2 and CO_2 across alveolar membrane

C. Pulmonary ventilation by which atmospheric air is drawn in and CO_2 rich alveolar air is released out

D. Cellular respiration

E. Transport of gases by the blood

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

(1) A, B, C, D, E (2) E, A, C, D, B

(3) C, B, E, A, D (4) C, A, B, E, D

Answer (3)

139. The following are the stages of life cycle of *Plasmodium.* Arrange the stages in the proper order.

A. The parasites reproduce asexually in RBCs, bursting the cells.

B. The parasites reproduce asexually in liver cells, bursting the cells and releasing into blood.

C. Gametocytes develop in RBCs.

D. Sporozoites reach the liver through the blood.

E. Female mosquito injects sporozoites into humans during bite.

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

(1) E, D, B, A, C

(2) A, B, C, D, E

(3) C, A, B, D, E

(4) E, C, D, B, A

Answer (1)

140. Insertion of a foreign DNA at BamHI site in an *E.coli* cloning vector pBR322 results in the loss of antibiotic resistance towards:

(1) Ampicillin and tetracycline

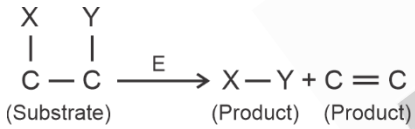
(2) Ampicillin

(3) Tetracycline

(4) Gentamycin

Answer (3)

141. The following reaction depicts the activity of a particular class of enzymes :



Identify the enzymes class 'E' from the following options :

(1) Transferases

(2) Isomerases

(3) Lyases

(4) Ligases

Answer (3)

142. The specific receptors for neurotransmitters in a synapse are present on _____.

(1) Schwann cell

(2) Pre-synaptic membrane

(3) Myelin sheath

(4) Post-synaptic membrane

Answer (4)

143. What is the probability of having children with 'O' blood group, where both mother and father are heterozygous for 'A' and 'B' blood group, respectively?

(1) 25%

(2) 0%

(3) 75%

(4) 50%

Answer (1)

144. Match List-I with List-II.

	List-I (Respiratory Volume)		List-II (Capacity in mL)
A.	ERV (Expiratory Reserve Volume)	I.	2500 – 3000 mL
B.	RV (Residual Volume)	II.	500 mL
C.	IRV (Inspiratory Reserve Volume)	III.	1000 – 1100 mL
D	TV (Tidal Volume)	IV.	1100 – 1200 mL

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

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

Answer (1)

145. Which of the following is **not** an example of convergent evolution?

(1) Flippers of penguins and dolphins
(2) Eyes of octopuses and mammals
(3) Fore limbs of whales and bats
(4) Wings of butterflies and birds

Answer (3)

146. Male frogs can be distinguished from female frogs due to the presence of

A. Bulging eyes
B. Vocal sacs
C. Webbed digits in feet
D. Copulatory pad on first digit of fore limbs
E. Olive green-coloured skin with dark irregular spots

Choose the correct answer from the options given below

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

Answer (4)

147. A group of researchers procured some fish like animals and upon investigation the following characters were observed:

A. Endoskeleton was made of cartilage.
B. Ectoparasitic; as they were found attached on fish skin with their circular sucking mouth.
C. Paired fins and scales were absent, but 7 pairs of gill slits were present.

Which of the following species of animals did they consider to fit best with these characters?

(1) *Scoliodon sp.*
(2) *Petromyzon sp.*
(3) *Exocoetus sp.*
(4) *Branchiostoma sp.*

Answer (2)

148. Match List I with List II with respect to chronology of evolution of life forms

	List-I		List-II
a.	About 65 mya	(i)	Jawless fish probably evolved
b.	About 500 mya	(ii)	The dinosaurs suddenly disappeared from the earth
c.	About 350 mya	(iii)	Seaweeds and few plants probably existed
d	About 320 mya	(iv)	Invertebrates were formed and became active

Choose the correct answer from the options given below:

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

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

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

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

Answer (4)

149. Match List I and List II

	List-I		List-II
a.	Progestasert	(i)	Barrier made of rubber used by females
b.	Multiload 375	(ii)	Oral contraceptive
c.	Diaphragm	(iii)	Hormone releasing IUD
d	Saheli	(iv)	Copper releasing IUD

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

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

(2) a(iv), b(ii), c(i), d(iiii)

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

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

Answer (1)

150. The WBC count of a person's blood sample is 8000/Cu mm. How many eosinophils and lymphocytes would be in the same blood sample approximately

(1) 300 – 500/Cu mm and 1200 – 1500/Cu mm respectively

(2) 160 – 240/Cu mm and 1600 – 2000/Cu mm respectively

(3) 300 – 500/Cu mm and 500 – 700/Cu mm respectively

(4) 100 – 120/Cu mm and 160 – 200/Cu mm respectively

Answer (2)

151. Match List I with List II:

	List I (Drug)		List II (Effect)
A.	Nicotine	I.	Causes sense of euphoria and increased energy
B.	Morphine	II.	Stimulates adrenal gland to release catecholamines into blood circulation
C.	Heroin	III.	Effective sedative and painkiller
D.	Cocaine	IV.	A depressant; slows down body function

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–II, B–III, C–IV, D–I

(4) A–III, B–II, C–I, D–IV

Answer (3)

152. The human protein named α-1-antitrypsin, obtained from transgenic animals, is used for the treatment of _____.

(1) Emphysema

(2) Alzheimer's disease

(3) Rheumatoid arthritis

(4) Cystic fibrosis

Answer (1)

153. Select the set of fishes which belong to the class Osteichthyes:

(1) Devil fish, Cuttlefish and Hagfish

(2) Saw fish, Fighting fish and Dog fish

(3) Star fish, Hagfish and Cuttlefish

(4) Flying fish, Angel fish and Fighting fish

Answer (4)

154. Select the **incorrect** statements from the following:

A. Digestive system in Platyhelminthes is incomplete.

B. Bilateral symmetry is a characteristic feature of adult Echinoderms.

C. Pseudocoelom is possessed by Aschelminthes.

D. Notochord is persistent throughout life in the class Chondrichthyes.

E. Members of class Reptilia maintain a constant body temperature.

Choose the answer from the options given below:

(1) A and C only

(2) B and E only

(3) C and D only

(4) B and D only

Answer (2)

155. Non-membrane bound cell organelles found in both prokaryotic and eukaryotic cells are _____.

(1) Ribosomes
(2) Lysosomes
(3) Centrosomes
(4) Mitochondria

Answer (1)

156. Which of the following equations depicts Verhulst-Pearl logistic population growth?

(1) $\frac{dN}{dt} = rN\left(\frac{K+N}{K}\right)$.

(2) $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$

(3) $\frac{dN}{dt} = rN\left(\frac{K-N}{N}\right)$

(4) $\frac{dN}{dt} = rN\left(\frac{K}{K-N}\right)$

Answer (2)

157. Select the **incorrect** statement with reference to Rh grouping.

A. Erythroblastosis foetalis is a condition observed having foetus with Rh^{-ve} blood and mother with Rh^{+ve} blood.

B. Rh antigen is observed on RBCs in the majority of human beings.

C. Before blood transfusion, Rh group should also be matched.

D. Rh incompatibility is observed when a pregnant mother is Rh^{-ve} and the foetus is Rh^{+ve}.

E. Erythroblastosis foetalis can be avoided by administering anti-Rh antibodies to the mother immediately after the delivery of the second child.

Choose the answer from the options given below :

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

Answer (3)

158. Match List I with List II:

	List I (Bioactive molecules)		**List II (Importance)**
A.	Streptokinase	I.	Immunosuppressive agent
B.	Statins	II.	Removal of clots from the blood vessels
C.	Lipases	III.	Blood cholesterol-lowering agent
D	Cyclosporin A	IV	Detergent formulations

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

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

Answer (4)

159. Match List I with List II:

	List I		List II
A.	Molluscs	I.	Pulmonary respiration only
B.	Reptiles	II.	Branchial respiration
C.	Adult amphibians	III.	Cellular respiration
D	Amoeba	IV	Pulmonary and cutaneous respiration

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

(1) A–II, B–I, C–IV, D–III

(2) A–I, B–II, C–IV, D–III

(3) A–II, B–I, C–III, D–IV

(4) A–III, B–II, C–I, D–IV

Answer (1)

160. The sixth mutant codon of beta globin gene causing polymerization of Haemoglobin and change in RBC shape is _____.

(1) GUG (2) AUG

(3) GAG (4) CAG

Answer (1)

161. Choose the correct statements regarding muscle contraction.

A. A motor neuron carries a signal sent by the Central Nervous System (CNS) to the sarcolemma of the muscle fibre.

B. The neural signal generates an action potential which causes the release of Ca++ into sarcoplasm.

C. Increase in Ca++ inactivates the actin for breaking cross bridges.

D. Actin binds to the myosin head to form a cross bridge.

E. Shortening of sarcomere takes place, by pulling actin filaments towards the centre of 'A' band.

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

(1) C and D only

(2) A and B only

(3) C and E only

(4) A, B, D and E only

Answer (4)

162. Which of the following statements are correct with reference to human endoskeleton?

A. Human skull is monocondylic.

B. The joint between any two adjoining vertebrae is a cartilaginous joint.

C. In human beings, the number of cervical vertebrae is seven.

D. All ribs except the last 2 pairs are bicephalic.

E. The occipital bone of skull is articulated with atlas vertebra.

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

(1) B and E only

(2) B, C and E only

(3) C, D and E only

(4) A, B and D only

Answer (2)

163. Spermatogonia undergo a series of cell divisions statements to produce sperms. Select the correct from the following :

A. Spermatogonia always undergo meiotic cell division.

B. Primary spermatocytes divide mitotically to produce secondary spermatocytes.

C. Secondary spermatocytes, through their second meiotic division, produce haploid spermatids.

D. Spermatids produce spermatozoa through mitosis.

E. Spermatids transform into spermatozoa by spermiogenesis.

Choose the correct answer from the options given below:

(1) A and E only

(2) C and E only

(3) A, C and E only

(4) B, C and D only

Answer (2)

164. The JGA (Juxta Glomerular Apparatus) is a special sensitive region formed by cellular modifications in _____ related to the same nephron.

(1) Distal convoluted tubule and efferent renal arteriole

(2) Proximal convoluted tubule and efferent renal arteriole

(3) Proximal convoluted tubule and afferent renal arteriole

(4) Distal convoluted tubule and afferent renal arteriole

Answer (4)

165. Which one of the following is an appropriate example of sexual deceit?

(1) Female wasp and fig

(2) Ophrys and bumblebee

(3) Sea anemone and clown fish

(4) Cuckoo and crow

Answer (2)

166. Choose the correct statements regarding frog's anatomy:

A. Hepatic portal system is the special venous connection between liver and intestine.

B. There are twelve pairs of cranial nerves arising from the brain.

C. The ureters and oviducts open separately into the cloaca in female frogs.

D. Hind-brain consists of cerebellum, medulla oblongata and optic lobes.

E. Sinus venosus joins the right atrium of heart.

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

(1) A, B and C only

(2) B and D only

(3) B and C only

(4) A, C and E only

Answer (4)

167. Match **List I** with **List II** related to embryonic development at various months of pregnancy:

	List-I		**List-II**
A.	The foetus movement starts and hair appears on the head	(I)	24 weeks of pregnancy
B.	The foetus develops limbs and digits	(II)	20 weeks of pregnancy
C.	The foetus develops external genital organs	(III)	8 weeks of pregnancy
D.	The foetus body is covered with fine hair; eyelids separate and eyelashes are formed	(IV)	12 weeks of pregnancy

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

(1) A-IV, B-II, C-III, D-I

(2) A-II, B-III, C-IV, D-I

(3) A-III, B-II, C-IV, D-I

(4) A-II, B-IV, C-III, D-I

Answer (4)

168. In a population of a grasshopper species, the chromosome number of some members is 23 and some other members possess 24 chromosomes. The 23 and 24 chromosome-bearing members in this species are _____.

(1) females and males, respectively

(2) all males

(3) males and females, respectively

(4) all females

Answer (3)

169. In which animal do haploid cells divide mitotically to produce gametes?

(1) Male honeybees

(2) Male earthworms

(3) Male frogs

(4) Male grasshoppers

Answer (1)

170. Arrange the following cell layers/structures around the female gamete, from outer to inner side :

A. Zona pellucida

B. Perivitelline space

C. Corona radiata

D. Plasma membrane of ovum

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

(1) D, B, A, C

(2) C, A, D, B

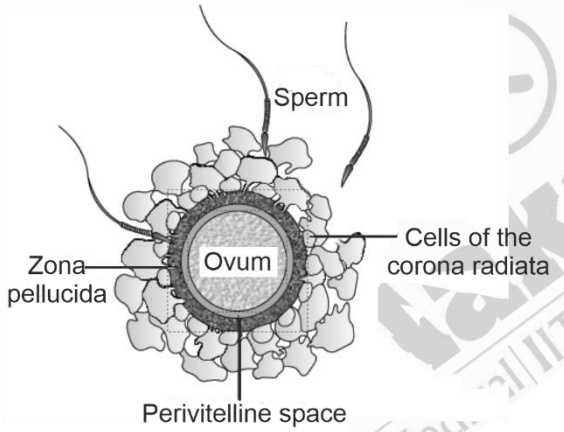
(3) C, A, B, D

(4) A, C, B, D

Answer (3)

Sol.

The cell layer/structure around the female gamete from outer to inner side is corona radiata → zona pellucida, perivitelline space → plasma membrane of ovum. So the correct answer is C, A, B, C, D that is represented in option (3)



171. What is the reason behind production of large holes in 'Swiss Cheese'?

(1) The production of large amount of CO_2 by *Propionibacterium sharmanii*

(2) The production of large amount of CO_2 by *Clostridium butylicum*

(3) The production of large amount of CO_2 and H_2 by lactic acid bacteria called Lactobacillus

(4) The production of large amount of CO_2 and H_2 by *Trichoderma polysporum*

Answer (1)

172. The toxin proteins isolated from *Bacillus thuringiensis*, coded by which of the following genes would contrl cotton bollworms and corn borer, respectively?

(1) *crylAc* and *crylAb*

(2) *crylAc* and *crylIAb*

(3) *crylIAb* and *crylAc*

(4) *crylAc* and *crylIIIAb*

Answer (1)

173. Ecological pyramids represent the relationship between the organisms at different trophic levels and they are generally inverted for:

(1) Pyramid of number in grassland
(2) Pyramid of energy in pond ecosystem
(3) Pyramid of biomass in grassland
(4) Pyramid of biomass in sea

Answer (4)

174. Choose the correct statement regarding GIFT to overcome infertility.

(1) Ova collected from a female donor are transferred to the uterus of an infertile female.
(2) Early embryos with up to 8 blastomeres are transferred to the uterus of an infertile female.
(3) Early embryos with up to 8 blastomeres are transferred into the fallopian tube of an infertile female.
(4) It is the transfer of an ovum collected from a donor into the fallopian tube of another female who cannot produce ovum but can provide suitable envoronment for fertilization and development.

Answer (4)

175. Choose the correct statements regarding cell organelles and their inclusions.

A. The endomembrane system includes Golgi complex, endoplasmic reticulum and mitochondria.
B. Rough endoplasmic reticulum bears ribosomes on its surface.
C. Both mitochondria and plastids have circular DNA.
D. A network of microtubules, microfilaments and intermediate filaments present in the cytoplasm is called cytoskeleton.
E. Mitochondrion is a single membrane-bound structure.

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

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

Answer (4)

176. Select the correct statements regarding cell membrane in eukaryotic cell.

A. Membrane of human RBCs has approximately 52% protein.
B. Major phospholipids are arranged in a bilayer.
C. Extensions of the plasma membrane into the cell form mesosomes.
D. Tails towards the inner part of lipids are hydrophobic and thus protected from aqueous medium.
E. Glycocalyx is present on the outer surface of the plasma membrane.

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

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

Answer (3)

177. Match List I with List II related to muscular/skeletal system:

	List I		List II
A.	Tetany	(I)	Inflammation of joints
B.	Arthritis	(II)	Autoimmune disorder affecting neuromuscular junction
C.	Myasthenia gravis	(III)	Wild contraction in muscle due to low Ca^{++} in body fluid
D	Muscular dystrophy	(IV)	Progressive degeneration of skeletal muscle

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

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

Answer (1)

178. Evolution of human appears parallel to the progressive development of brain and language skills. As such, the evolution of individual species in the sequence of their appearance is:

(1) *Ramapithecus* → *Homo habilis* → *Homo erectus* → *Neanderthal* → *Homo sapiens*
(2) *Homo sapiens* → *Ramapithecus* → *Homo habilis* → *Neanderthal* → *Homo erectus*
(3) *Homo habilis* → *Homo erectus* → *Ramapithecus* → *Neanderthal* → *Homo sapiens*
(4) *Neanderthal* → *Ramapithecus* → *Homo habilis* → *Homo erectus* → *Homo sapiens*

Answer (1)

179. The flightless bird with forelimbs modified as paddle-like structures suited for swimming is known as:

(1) *Struthio*
(2) *Neophron*
(3) *Aptenodytes*
(4) *Psittacula*

Answer (3)

180. Choose the correct statements regarding population interactions between two species.

A. In both parasitism and commensalism, only one species benefits and the other species is harmed.
B. Both species benefit in mutualism.
C. Both species benefit in commensalism.
D. In parasitism, only one species benefits and the other species is harmed.
E. In amensalism, one species is harmed and the other is unaffected.

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

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

Answer (3)

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