

**Section - A (Biology : Zoology)**

151. Which of the following characteristics is **incorrect** with respect to cockroach ?
- (1) A ring of gastric caeca is present at the junction of midgut and hind gut.
  - (2) Hypopharynx lies within the cavity enclosed by the mouth parts.
  - (3) In females, 7<sup>th</sup>-9<sup>th</sup> sterna together form a genital pouch.
  - (4) 10<sup>th</sup> abdominal segment in both sexes, bears a pair of anal cerci.
152. Match **List - I** with **List - II**.

List - I		List - II	
(a)	Metamerism	(i)	Coelenterata
(b)	Canal system	(ii)	Ctenophora
(c)	Comb plates	(iii)	Annelida
(d)	Cnidoblasts	(iv)	Porifera

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

- |     |            |            |            |            |
|-----|------------|------------|------------|------------|
|     | <b>(a)</b> | <b>(b)</b> | <b>(c)</b> | <b>(d)</b> |
| (1) | (iv)       | (iii)      | (i)        | (ii)       |
| (2) | (iii)      | (iv)       | (i)        | (ii)       |
| (3) | (iii)      | (iv)       | (ii)       | (i)        |
| (4) | (iv)       | (i)        | (ii)       | (iii)      |

153. A specific recognition sequence identified by endonucleases to make cuts at specific positions within the DNA is :
- (1) Degenerate primer sequence
  - (2) Okazaki sequences
  - (3) Palindromic Nucleotide sequences
  - (4) Poly(A) tail sequences
154. The fruit fly has 8 chromosomes (2n) in each cell. During interphase of Mitosis if the number of chromosomes at G<sub>1</sub> phase is 8, what would be the number of chromosomes after S phase ?
- (1) 8
  - (2) 16
  - (3) 4
  - (4) 32
155. Persons with 'AB' blood group are called as "Universal recipients". This is due to :
- (1) Absence of antigens A and B on the surface of RBCs
  - (2) Absence of antigens A and B in plasma
  - (3) Presence of antibodies, anti-A and anti-B, on RBCs
  - (4) Absence of antibodies, anti-A and anti-B, in plasma

156. Which of the following statements wrongly represents the nature of smooth muscle ?
- (1) These muscle have no striations
  - (2) They are involuntary muscles
  - (3) Communication among the cells is performed by intercalated discs
  - (4) These muscles are present in the wall of blood vessels
157. Which one of the following belongs to the family Muscidae ?
- (1) Fire fly
  - (2) Grasshopper
  - (3) Cockroach
  - (4) House fly
158. Which is the "Only enzyme" that has "Capability" to catalyse Initiation, Elongation and Termination in the process of transcription in prokaryotes ?
- (1) DNA dependent DNA polymerase
  - (2) DNA dependent RNA polymerase
  - (3) DNA Ligase
  - (4) DNase
159. Which of the following RNAs is not required for the synthesis of protein ?
- (1) mRNA
  - (2) tRNA
  - (3) rRNA
  - (4) siRNA
160. For effective treatment of the disease, early diagnosis and understanding its pathophysiology is very important. Which of the following molecular diagnostic techniques is very useful for early detection ?
- (1) Western Blotting Technique
  - (2) Southern Blotting Technique
  - (3) ELISA Technique
  - (4) Hybridization Technique
161. Erythropoietin hormone which stimulates R.B.C. formation is produced by :
- (1) Alpha cells of pancreas
  - (2) The cells of rostral adenohypophysis
  - (3) The cells of bone marrow
  - (4) Juxtaglomerular cells of the kidney
162. The partial pressures (in mm Hg) of oxygen ( $O_2$ ) and carbon dioxide ( $CO_2$ ) at alveoli (the site of diffusion) are :
- (1)  $pO_2 = 104$  and  $pCO_2 = 40$
  - (2)  $pO_2 = 40$  and  $pCO_2 = 45$
  - (3)  $pO_2 = 95$  and  $pCO_2 = 40$
  - (4)  $pO_2 = 159$  and  $pCO_2 = 0.3$
163. In a cross between a male and female, both heterozygous for sickle cell anaemia gene, what percentage of the progeny will be diseased ?
- (1) 50%
  - (2) 75%
  - (3) 25%
  - (4) 100%
164. Which stage of meiotic prophase shows terminalisation of chiasmata as its distinctive feature ?
- (1) Leptotene
  - (2) Zygotene
  - (3) Diakinesis
  - (4) Pachytene
165. Which one of the following organisms bears hollow and pneumatic long bones ?
- (1) *Neophron*
  - (2) *Hemidactylus*
  - (3) *Macropus*
  - (4) *Ornithorhynchus*
166. Match the following :
- | List - I |                    | List - II |                       |
|----------|--------------------|-----------|-----------------------|
| (a)      | <i>Physalia</i>    | (i)       | Pearl oyster          |
| (b)      | <i>Limulus</i>     | (ii)      | Portuguese Man of War |
| (c)      | <i>Ancylostoma</i> | (iii)     | Living fossil         |
| (d)      | <i>Pinctada</i>    | (iv)      | Hookworm              |
- Choose the **correct** answer from the options given below.
- |     | (a)  | (b)   | (c)   | (d)  |
|-----|------|-------|-------|------|
| (1) | (ii) | (iii) | (i)   | (iv) |
| (2) | (iv) | (i)   | (iii) | (ii) |
| (3) | (ii) | (iii) | (iv)  | (i)  |
| (4) | (i)  | (iv)  | (iii) | (ii) |
167. Which of the following is **not** an objective of Biofortification in crops ?
- (1) Improve protein content
  - (2) Improve resistance to diseases
  - (3) Improve vitamin content
  - (4) Improve micronutrient and mineral content

168. If Adenine makes 30% of the DNA molecule, what will be the percentage of Thymine, Guanine and Cytosine in it ?

- (1) T : 20 ; G : 30 ; C : 20
- (2) T : 20 ; G : 20 ; C : 30
- (3) T : 30 ; G : 20 ; C : 20
- (4) T : 20 ; G : 25 ; C : 25

169. Match List - I with List - II.

List - I		List - II	
(a)	Vaults	(i)	Entry of sperm through Cervix is blocked
(b)	IUDs	(ii)	Removal of Vas deferens
(c)	Vasectomy	(iii)	Phagocytosis of sperms within the Uterus
(d)	Tubectomy	(iv)	Removal of fallopian tube

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

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

170. Venereal diseases can spread through :

- (a) Using sterile needles
- (b) Transfusion of blood from infected person
- (c) Infected mother to foetus
- (d) Kissing
- (e) Inheritance

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

- (1) (a), (b) and (c) only
- (2) (b), (c) and (d) only
- (3) (b) and (c) only
- (4) (a) and (c) only

171. The centriole undergoes duplication during :

- (1) S-phase
- (2) Prophase
- (3) Metaphase
- (4) G<sub>2</sub> phase

172. Receptors for sperm binding in mammals are present on :

- (1) Corona radiata
- (2) Vitelline membrane
- (3) Perivitelline space
- (4) Zona pellucida

173. Dobson units are used to measure thickness of :

- (1) CFCs
- (2) Stratosphere
- (3) Ozone
- (4) Troposphere

174. Match List - I with List - II.

List - I		List - II	
(a)	<i>Aspergillus niger</i>	(i)	Acetic Acid
(b)	<i>Acetobacter aceti</i>	(ii)	Lactic Acid
(c)	<i>Clostridium butylicum</i>	(iii)	Citric Acid
(d)	<i>Lactobacillus</i>	(iv)	Butyric Acid

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

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

175. Identify the **incorrect** pair.

- (1) Alkaloids - Codeine
- (2) Toxin - Abrin
- (3) Lectins - Concanavalin A
- (4) Drugs - Ricin

176. The organelles that are included in the endomembrane system are :

- (1) Endoplasmic reticulum, Mitochondria, Ribosomes and Lysosomes
- (2) Endoplasmic reticulum, Golgi complex, Lysosomes and Vacuoles
- (3) Golgi complex, Mitochondria, Ribosomes and Lysosomes
- (4) Golgi complex, Endoplasmic reticulum, Mitochondria and Lysosomes

177. Chronic auto immune disorder affecting neuro muscular junction leading to fatigue, weakening and paralysis of skeletal muscle is called as :

- (1) Arthritis
- (2) Muscular dystrophy
- (3) Myasthenia gravis
- (4) Gout

178. With regard to insulin choose correct options.

- (a) C-peptide is not present in mature insulin.
- (b) The insulin produced by rDNA technology has C-peptide.
- (c) The pro-insulin has C-peptide.
- (d) A-peptide and B-peptide of insulin are interconnected by disulphide bridges.

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

- (1) (b) and (d) only
- (2) (b) and (c) only
- (3) (a), (c) and (d) only
- (4) (a) and (d) only

179. During the process of gene amplification using PCR, if very high temperature is not maintained in the beginning, then which of the following steps of PCR will be affected first ?

- (1) Annealing
- (2) Extension
- (3) Denaturation
- (4) Ligation

180. Which enzyme is responsible for the conversion of inactive fibrinogens to fibrins ?

- (1) Thrombin
- (2) Renin
- (3) Epinephrine
- (4) Thrombokinase

181. Succus entericus is referred to as :

- (1) Pancreatic juice
- (2) Intestinal juice
- (3) Gastric juice
- (4) Chyme

182. Select the favourable conditions required for the formation of oxyhaemoglobin at the alveoli.

- (1) High  $pO_2$ , low  $pCO_2$ , less  $H^+$ , lower temperature
- (2) Low  $pO_2$ , high  $pCO_2$ , more  $H^+$ , higher temperature
- (3) High  $pO_2$ , high  $pCO_2$ , less  $H^+$ , higher temperature
- (4) Low  $pO_2$ , low  $pCO_2$ , more  $H^+$ , higher temperature

183. Which one of the following is an example of Hormone releasing IUD ?

- (1) CuT
- (2) LNG 20
- (3) Cu 7
- (4) Multiload 375

184. Sphincter of oddi is present at :

- (1) Ileo-caecal junction
- (2) Junction of hepato-pancreatic duct and duodenum
- (3) Gastro-oesophageal junction
- (4) Junction of jejunum and duodenum

185. Read the following statements.

- (a) Metagenesis is observed in Helminths.
- (b) Echinoderms are triploblastic and coelomate animals.
- (c) Round worms have organ-system level of body organization.
- (d) Comb plates present in ctenophores help in digestion.
- (e) Water vascular system is characteristic of Echinoderms.

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

- (1) (c), (d) and (e) are correct
- (2) (a), (b) and (c) are correct
- (3) (a), (d) and (e) are correct
- (4) (b), (c) and (e) are correct

### Section - B (Biology : Zoology)

186. Which of these is not an important component of initiation of parturition in humans ?

- (1) Increase in estrogen and progesterone ratio
- (2) Synthesis of prostaglandins
- (3) Release of Oxytocin
- (4) Release of Prolactin

187. During muscular contraction which of the following events occur ?

- (a) 'H' zone disappears
- (b) 'A' band widens
- (c) 'I' band reduces in width
- (d) Myosine hydrolyzes ATP, releasing the ADP and Pi
- (e) Z-lines attached to actins are pulled inwards

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

- (1) (a), (c), (d), (e) only
- (2) (a), (b), (c), (d) only
- (3) (b), (c), (d), (e) only
- (4) (b), (d), (e), (a) only

188. Following are the statements with reference to 'lipids'.

- Lipids having only single bonds are called unsaturated fatty acids.
- Lecithin is a phospholipid.
- Trihydroxy propane is glycerol.
- Palmitic acid has 20 carbon atoms including carboxyl carbon.
- Arachidonic acid has 16 carbon atoms.

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

- (a) and (b) only
- (c) and (d) only
- (b) and (c) only
- (b) and (e) only

189. Which of the following is **not** a step in Multiple Ovulation Embryo Transfer Technology (MOET) ?

- Cow is administered hormone having LH like activity for super ovulation
- Cow yields about 6-8 eggs at a time
- Cow is fertilized by artificial insemination
- Fertilized eggs are transferred to surrogate mothers at 8-32 cell stage

190. Identify the types of cell junctions that help to stop the leakage of the substances across a tissue and facilitation of communication with neighbouring cells via rapid transfer of ions and molecules.

- Gap junctions and Adhering junctions, respectively.
- Tight junctions and Gap junctions, respectively.
- Adhering junctions and Tight junctions, respectively.
- Adhering junctions and Gap junctions, respectively.

191. The Adenosine deaminase deficiency results into :

- Dysfunction of Immune system
- Parkinson's disease
- Digestive disorder
- Addison's disease

192. **Statement I :**

The codon 'AUG' codes for methionine and phenylalanine.

**Statement II :**

'AAA' and 'AAG' both codons code for the amino acid lysine.

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

- Both **Statement I** and **Statement II** are true
- Both **Statement I** and **Statement II** are false
- Statement I** is correct but **Statement II** is false
- Statement I** is incorrect but **Statement II** is true

193. Match **List - I** with **List - II**.

List - I		List - II	
(a)	Scapula	(i)	Cartilaginous joints
(b)	Cranium	(ii)	Flat bone
(c)	Sternum	(iii)	Fibrous joints
(d)	Vertebral column	(iv)	Triangular flat bone

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

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

194. Match **List - I** with **List - II**.

List - I		List - II	
(a)	Filariasis	(i)	<i>Haemophilus influenzae</i>
(b)	Amoebiasis	(ii)	<i>Trichophyton</i>
(c)	Pneumonia	(iii)	<i>Wuchereria bancrofti</i>
(d)	Ringworm	(iv)	<i>Entamoeba histolytica</i>

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

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

195. Following are the statements about prostomium of earthworm.

- It serves as a covering for mouth.
- It helps to open cracks in the soil into which it can crawl.
- It is one of the sensory structures.
- It is the first body segment.

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

- (a), (b) and (c) are correct
- (a), (b) and (d) are correct
- (a), (b), (c) and (d) are correct
- (b) and (c) are correct

196. Which of the following secretes the hormone, relaxin, during the later phase of pregnancy ?

- Graafian follicle
- Corpus luteum
- Foetus
- Uterus

197. Which one of the following statements about Histones is **wrong** ?

- Histones are organized to form a unit of 8 molecules.
- The pH of histones is slightly acidic.
- Histones are rich in amino acids - Lysine and Arginine.
- Histones carry positive charge in the side chain.

198. **Assertion (A) :**

A person goes to high altitude and experiences 'altitude sickness' with symptoms like breathing difficulty and heart palpitations.

**Reason (R) :**

Due to low atmospheric pressure at high altitude, the body does not get sufficient oxygen.

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

- Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**
- Both **(A)** and **(R)** are true but **(R)** is not the correct explanation of **(A)**
- (A)** is true but **(R)** is false
- (A)** is false but **(R)** is true

199. Match **List - I** with **List - II**.

List - I		List - II	
(a)	Allen's Rule	(i)	Kangaroo rat
(b)	Physiological adaptation	(ii)	Desert lizard
(c)	Behavioural adaptation	(iii)	Marine fish at depth
(d)	Biochemical adaptation	(iv)	Polar seal

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

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

200. Match **List - I** with **List - II**.

List - I		List - II	
(a)	Adaptive radiation	(i)	Selection of resistant varieties due to excessive use of herbicides and pesticides
(b)	Convergent evolution	(ii)	Bones of forelimbs in Man and Whale
(c)	Divergent evolution	(iii)	Wings of Butterfly and Bird
(d)	Evolution by anthropogenic action	(iv)	Darwin Finches

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

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

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