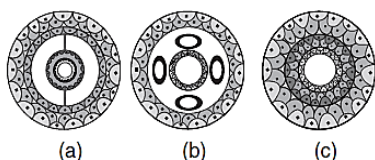


**ZOOLOGY****SECTION-A**

1. The figures given below show the types of coelom, identify them and select the **correct** group of organisms which possess them.



	(a)	(b)	(c)
(1)	Annelids	Aschelminthes	Platyhelminthes
(2)	Molluscs	Arthropods	Platyhelminthes
(3)	Echinoderms	Aschelminthes	Annelids
(4)	Echinoderms	Arthropods	Platyhelminthes

2. Which of the following is **correct** about metamerism (true segmentation)?

- (1) Every organ shows serial repetition.
- (2) Body is divided externally as well as internally.
- (3) Each segment is not supplied with separate nerves and blood vessels.
- (4) All of these.

3. Which of the following is a characteristic feature of Echinodermata?

- (1) Smooth skin and radial symmetry
- (2) Spiny skin and radial symmetry
- (3) Spiny skin and bilateral symmetry
- (4) Smooth skin and bilateral symmetry

4. Which of the following animals is cold blooded and has a four-chambered heart?

- (1) *Rana*
- (2) *Ornithorhynchus*
- (3) Crocodile
- (4) *Scoliodon*

5. Point out the mammalian characters.

- (1) Diaphragm, four chambered heart, lungs
- (2) Hairy skin, viviparity, feathers
- (3) Fins, gills, viviparity
- (4) Neural gland, gills, four chambered heart

6. Which of the following statements is **false** about the glands?

- (1) Goblet cells secrete mucus.
- (2) Exocrine glands possess duct for secretion of mucus, milk, saliva, earwax, digestive enzymes, oil and other cell products.
- (3) Glandular epithelium consists of specialised columnar or cuboidal cells.
- (4) Endocrine glands secrete a variety of enzymes only.

7. Which of the following is **incorrect** with respect to junction and its function?

(1)	Tight junction	Promotes leaking of substances across a tissue
(2)	Adhering junction	Keeps neighbouring cells together
(3)	Gap junction	Connects the cytoplasm of adjoining cells for rapid transfer of ions and small molecules
(4)	Gap junction	Facilitates the cells to communicate with each other

8. Cartilage is present at :

- (a) tip of nose.
- (b) between adjacent bones of the vertebral column.
- (c) outer ear joints.
- (1) (a) and (b)
- (2) (b) and (c)
- (3) (a) and (c)
- (4) (a), (b) and (c)

9. Mark the **mismatched** pair.

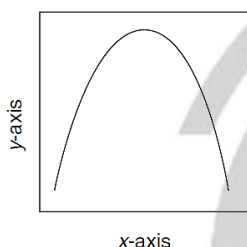
- (1) Toxins – Ricin
- (2) Alkaloids - Codeine
- (3) Drugs - Vinblastine
- (4) Lectin -Curcumin



10. In a protein, amino acids are linked by a peptide bonds, which is formed by the reaction of :
- (1)  $-\text{COOH}$  group of one amino acid with  $-\text{NH}_2$  group of next amino acid.
  - (2)  $-\text{NH}_3$  group of one amino acid with  $-\text{COOH}$  group of next amino acid.
  - (3)  $-\text{COOH}$  groups of two amino acids.
  - (4)  $-\text{NH}_2$  groups of two amino acids.

11. Lipids belong to which of the following groups?
- (1) Amino proteins
  - (2) Macromolecules
  - (3) Secondary metabolites
  - (4) Metabolic by-products

12. The curve given below show enzymatic activity with relation to three conditions (pH, temperature and substrate concentration)



What do the two axes (x and y) represent?

**X-axis**

**Y-axis**

- (1) Enzymatic activity – Temperature
  - (2) Enzymatic activity – pH
  - (3) Temperature – Enzymatic activity
  - (4) Substrate concentration – Enzymatic activity
13. Which one of the following organisms bears hollow and pneumatic long bones?
- (1) *Ornithorhynchus*
  - (2) *Neophron*
  - (3) *Hemidactylus*
  - (4) *Macropus*
14. Which of the following statements **wrongly** represents the nature of smooth muscle?
- (1) These muscles are present in the wall of blood vessels.
  - (2) These muscle have no striations.
  - (3) They are involuntary muscles.
  - (4) Communication among the cells is performed by intercalated discs.

15. Match **List-I** with **List-II** and choose the **correct** option :

	List - I		List - II
(A)	Protein	(I)	C = C double bonds
(B)	Unsaturated fatty acid	(II)	Phosphodiester bonds
(C)	Nucleic acid	(III)	Glycosidic bonds
(D)	Polysaccharide	(IV)	Peptide bonds

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

16. During forced expiration, actively contracting muscles include:

- (1) Diaphragm.
- (2) External intercostals.
- (3) Internal intercostal and abdominal muscles.
- (4) Diaphragm and intestinal muscle.

17. Each cerebral hemisphere is divided into \_\_\_\_\_ lobes by sulci.

- (1) 3
- (2) 4
- (3) 5
- (4) 6

18. The cerebrum wraps around a structure called thalamus, which is;

- (1) a major coordinating centre for sensory signal only.
- (2) a major centre for motor signalling.
- (3) a major coordinating centre for sensory and motor signalling.
- (4) interconnects different regions of the brain.



19. Select the **true** statement about RBC.
- (1) RBCs have an average life span of 120 days.
  - (2) RBCs are destroyed in the spleen (graveyard of RBCs).
  - (3) RBCs are devoid of nucleus in most of the mammals.
  - (4) All of these.
20. Blood differs from real connective tissue because;
- (1) Plasma of blood is not entirely secreted by blood cells.
  - (2) Blood corpuscles are not formed in blood.
  - (3) Fibres are absent in blood.
  - (4) All of these.
21. Mammals are said to have double circulation. It means;
- (1) blood vessels are paired.
  - (2) there are two types of blood vessels attached to every organ.
  - (3) there are two systems, one from the heart to the lungs and other from heart to the rest of the body.
  - (4) blood circulates once through heart.
22. Hormone renin is produced from which part of kidney?
- (1) Proximal convoluted tubule (PCT)
  - (2) Distal convoluted tubule (DCT)
  - (3) Juxtaglomerular apparatus (JGA)
  - (4) Renal Pyramids
23. Following are the points of mechanism of juxta glomerular apparatus (JGA). Arrange them in the **correct** order.
- (a) Activation of juxta glomerular (JG) cells.
  - (b) Activated JG cells release renin.
  - (c) Fall in glomerular filtration rate (GFR).
  - (d) Increase of glomerular blood flow.
  - (e) GFR back to normal.
- (1) (e)  $\rightarrow$  (a)  $\rightarrow$  (d)  $\rightarrow$  (c)  $\rightarrow$  (b)
  - (2) (c)  $\rightarrow$  (a)  $\rightarrow$  (b)  $\rightarrow$  (d)  $\rightarrow$  (e)
  - (3) (a)  $\rightarrow$  (b)  $\rightarrow$  (c)  $\rightarrow$  (d)  $\rightarrow$  (e)
  - (4) (c)  $\rightarrow$  (a)  $\rightarrow$  (d)  $\rightarrow$  (b)  $\rightarrow$  (e)
24. The effect of antidiuretic hormone (ADH) on the kidney is to increase the;
- (1) Excretion of water.
  - (2) Excretion of  $\text{Na}^+$ .
  - (3) Permeability of the distal nephron to water.
  - (4) Glomerular filtration rate.
25. Binding of  $\text{Ca}^{2+}$  with \_\_\_\_\_ in skeletal muscles and leads to the exposure of the binding site for \_\_\_\_\_ on the filament \_\_\_\_\_.
- (1) Troponin; myosin; actin
  - (2) Troponin; actin; relaxin
  - (3) Actin; myosin; troponin
  - (4) Tropomyosin; myosin; actin
26. Smooth muscle fibres are;
- (1) cylindrical, unbranched, striated, multinucleate and voluntary.
  - (2) spindle-shaped, unbranched, non-striated, uninucleate and involuntary.
  - (3) cylindrical, unbranched, non-striated, multinucleate and involuntary.
  - (4) spindle-shaped, unbranched, striated, uninucleate and voluntary.
27. Which of the following statements is **false**?
- (1) Scapula has the spine which projects as acromion process.
  - (2) Below acromion process is a glenoid cavity.
  - (3) Each clavicle (collar bone) articulates with acromion.
  - (4) Clavicle is long S-shaped bone with 4 curvatures.
28. Nodes of Ranvier are;
- (1) areas of swellings of axon.
  - (2) found in the wall of stomach.
  - (3) the gaps between two adjacent myelin sheath.
  - (4) bands in striated muscles.
29.  $\text{Na}^+ - \text{K}^+$  pump:
- (a) Needs energy (ATP) to work.
  - (b) Expels  $3\text{Na}^+$  for every  $2\text{K}^+$  ions imported.
  - (c) Works against a concentration gradient.
  - (d) Maintains resting potential.
- (1) Only (c)
  - (2) Only (b) and (c) are correct
  - (3) Only (a) and (c) are correct
  - (4) All of these



30. PNS is divided into;
- (1) Somatic neural system
  - (2) autonomic neural system
  - (3) Central nervous system
  - (4) Both (1) and (2)

31. **Assertion (A):** Resting membrane potential is -70mV.

**Reason (R):**  $\text{Na}^+$  -  $\text{K}^+$  pump plays an important role in maintaining resting membrane potential.

- (1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is true, and **Reason (R)** is false.
- (4) **Assertion (A)** is false, and **Reason (R)** is true.

32. Match **List-I** with **List-II** and choose the correct option:

List - I		List - II	
(A)	PRL	(I)	Gonadotropins
(B)	TSH	(II)	Glucocorticoids
(C)	ACTH	(III)	Thyroid hormone
(D)	LH and FSH	(IV)	Mammary glands

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

33. Select the correct matching :

- (1) Insulin – Decreases uptake of glucose utilisation by hepatocyte and adipocytes
- (2) Cortisol – Decreases RBC production, causes inflammation
- (3) Thymosin – Promotes production of antibodies to provide humoral immunity also.
- (4) Thyroxine – No role in water and electrolyte balance.

34. Mark antagonistic hormones.

- (1) Insulin and glucagon
- (2) Adrenaline and noradrenaline
- (3) Calcitonin and parathormone
- (4) Both (1) and (3)

35. The secretin promotes the release of;
- (1) HCl and sodium carbonate ions.
  - (2) HCl and bicarbonate ions in gastric juice.
  - (3) Water and bicarbonates ions in pancreatic juice.
  - (4) Pancreatic enzymes and mucus.

### **SECTION-B**

36. (1) Marine with streamlined body  
(2) Cartilaginous endoskeleton  
(3) Mouth ventral  
(4) Caudal fin is heterocercal  
(5) Notochord is persistent throughout life

Above characters belong to how many of the following organisms?

Dogfish, Sawfish, Flying fish, Fighting fish, Angelfish, Jellyfish, Starfish, Trygon, Torpedo, Rohu, Catla, Magur

- (1) Three
- (2) Four
- (3) Six
- (4) Seven

37. Which of the following is **not** a characteristic feature of biceps muscle?

- (1) We are usually able to make it contract merely by thinking about it.
- (2) It has alternate light and dark bands.
- (3) Its muscle fibres taper at both ends.
- (4) Its muscle fibres are bundled together in a parallel fashion.

38. **Assertion (A):** Three kinds of cofactors may be identified: Prosthetic groups, co-enzymes and metal ions.

**Reason (R):** A complete, catalytically active enzyme together with its bound prosthetic group is called apoenzyme.

- (1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is true, and **Reason (R)** is false.
- (4) **Assertion (A)** is false, and **Reason (R)** is true.



39. Which of the following statements are **correct** with respect to vital capacity?

- (a) It includes ERV, TV and IRV
- (b) Total volume of air a person can inspire after a normal expiration.
- (c) The maximum volume of air a person can breathe in after forced expiration.
- (d) It includes ERV, RV and IRV.
- (e) The maximum volume of air a person can breath out after a forced inspiration.

Choose the **most appropriate** answer from the options given below:

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

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

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

41. Given below are four statements (a) – (d) regarding human blood circulatory system:

- (a) Arteries are thick-walled and have narrow lumen as compared to veins.
- (b) Angina is acute chest pain when the blood circulation to the brain is reduced.
- (c) Persons with blood group AB can donate blood to any person with any blood group under the ABO system.
- (d) Calcium ions play a very important role in blood clotting.

Which two of the above statements are **correct**?

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

42. Which of the following statements is **not** true about blood pressure?

- (1) Blood pressure is measured with an instrument called a sphygmomanometer.
- (2) If the blood pressure of an individual is 140/90 mm Hg or higher, it shows hypertension.
- (3) The normal systolic pressure is 120 mm Hg and diastolic pressure is 80 mm Hg.
- (4) Hypertension is caused by vasodilation which results in increased resistance to blood flow.

43. Which of the following is **correctly** matched?

- (1) Afferent arterioles – Carry blood away from glomerulus towards renal vein.
- (2) Podocytes – Create slit pores for filtration of blood into Bowman's capsule.
- (3) Henle's loop – Most reabsorption of major substances from filtrate.
- (4) DCT – Reabsorption of  $K^+$  ions into surrounding blood capillaries.

44. Following are the steps of dialysis.

- (a) Blood is passed into a vein.
- (b) Blood is mixed with heparin.
- (c) Blood is mixed with anti-heparin.
- (d) Blood is drained from convenient artery.
- (e) Blood is passed through a coiled and porous cellophane tube bathing in dialysing fluid.
- (f) Removal of nitrogenous wastes from blood.

Their **correct** order is:

- (1) (a) → (b) → (c) → (d) → (e) → (f)
- (2) (d) → (b) → (e) → (f) → (c) → (a)
- (3) (f) → (c) → (e) → (b) → (a) → (d)
- (4) (d) → (c) → (e) → (f) → (b) → (a)

45. Which of the following statements is **incorrect** about skeletal muscles?

- (1) Striped appearance under microscope hence called striated muscle.
- (2) They are voluntary muscles.
- (3) Primarily involved in locomotory actions and changes of body postures.
- (4) They are involuntary muscles.

46. Identify a **wrong** statement with respect to ribs.

- (1) The ribs are curved bars, which are movable, articulate with the thoracic vertebrae at the back and unite with the sternum in front, all collectively forming a bony cage, the thoracic basket.
- (2) Seventh rib is usually floating in Japanese and some other people.
- (3) The upper seven pairs of ribs are attached in front directly to the sternum. These are called true ribs.
- (4) The lower two pairs of ribs are free in front, they are known as floating ribs.





47. Which of the following statement(s) is/are **false** about the electrical synapse?
- (a) Electrical current can flow directly from one neuron into the other across the synapses.
  - (b) At electrical synapses, the membranes of pre and post-synaptic neurons are in very close proximity.
  - (c) Electrical synapses are rare in our system.
  - (d) Electrical synapses pass electrical signals between cells with the use of acetylcholine.
  - (e) Electrical synapses are fast.
  - (f) Transmission of an impulse across electrical synapses is very similar to impulse conduction along single axon.
- (1) (a) and (b)      (2) Only (b)  
(3) Only (d)      (4) Only (e)
48. According to the sliding filament theory;
- (1) The actin filaments slide away from A-band resulting in shortening of sarcomere.
  - (2) Actin and myosin filaments slide over each other to increase the length of the sarcomere.
  - (3) Length of A-band does not change
  - (4) I-band increases in length.
49. Arrange the sequence of action of work of FSH?
- (a) Binding to membrane receptor
  - (b) Biochemical response
  - (c) Generation of second messenger
  - (d) Physiological response (e.g., Ovarian growth)
- (1) (a) → (b) → (c) → (d)  
(2) (a) → (c) → (b) → (d)  
(3) (d) → (c) → (b) → (a)  
(4) (c) → (a) → (d) → (b)
50. Read the following statements and choose the **right** option.
- (a) Calcitonin is non-iodized hormone secreted by parafollicular cells of the thyroid gland.
  - (b) Maximum iodine is stored in the thyroid gland.
  - (c) TCT is a hypocalcemic factor.
  - (d) Calcitonin (TCT) regulates the blood  $\text{Ca}^{2+}$  level.
- (1) All are correct  
(2) All are wrong  
(3) (a), (b) and (c) are correct  
(4) Only (d) is correct

