

**MULTIPLE CHOICE QUESTIONS**

**1. In some animal groups, the body is found divided into compartments with a serial repetition of at least some organs. This characteristic feature is called**

- a. Segmentation**
- b. Metamerism**
- c. Metagenesis**
- d. Metamorphosis**

**Solution:**

Option (b) is the answer.

**2. Given below are types of cells present in some animals. Which of the following cells can differentiate to perform different functions?**

- a. Choanocytes**
- b. Interstitial cells**
- c. Gastrodermal cells**
- d. Nematocytes**

**Solution:**

Option (b) is the answer.

**3. Which one of the following sets of animals shares a four-chambered heart?**

- a. Amphibian, Reptiles, Birds**
- b. Crocodiles, Birds, Mammals**
- c. Crocodiles, Lizards, Turtles**
- d. Lizards, Mammals, Birds**

**Solution:**

Option (b) is the answer.

**4. Which of the following pairs of animals has non-glandular skin a? Snake and Frog**

- b. Chameleon and Turtle**
- c. Frog and Pigeon**
- d. Crocodile and Tiger**

**Solution:**

Option (b) is the answer.

**5. Birds and mammals share one of the following characteristics as a common feature.**

- a. Pigmented skin**
- b. Pneumatic bones**
- c. Viviparity**
- d. Warm-blooded**

**Solution:**

Option (d) is the answer.

6. Which one of the following sets of animals belongs to a single taxonomic group?

- a. Cuttlefish, Jellyfish, Silverfish, Dogfish, Starfish
- b. Bat, Pigeon, Butterfly
- c. Monkey, Chimpanzee, Man
- d. Silkworm, Tapeworm, Earthworm

**Solution:**

Option (c) is the answer.

7. Which one of the following statements is incorrect?

- a. Mesoglea is present in between ectoderm and endoderm in Obelia.
- b. Exhibits radial symmetry Asterias
- c. Fasciola is a pseudocoelomate animal
- d. Taenia is a triploblastic animal

**Solution:**

Option (c) is the answer.

8. Which one of the following statements is incorrect?

- a. In cockroaches and prawns excretion of waste material occurs through malpighian tubules.
- b. In ctenophores, locomotion is mediated by comb plates.
- c. In Fasciola, flame cells help in excretion
- d. Earthworms are hermaphrodites and yet cross-fertilization takes place among them.

**Solution:**

Option (a) is the answer.

9. Which one of the following is oviparous?

- a. Platypus
- b. Flying fox (Bat)
- c. Elephant
- d. Whale

**Solution:**

Option (a) is the answer.

10. Which one of the following is a non-poisonous snake?

- a. Cobra
- b. Viper
- c. Python
- d. Krait

**Solution:**

Option (c) is the answer.

11. Match the following list of animals with their level of organisation.

| Division of Labour<br>Column I | Animal<br>Column II |
|--------------------------------|---------------------|
|--------------------------------|---------------------|

|   |  |
|---|--|
| A. Organ level<br>B. Cellular aggregate level<br>C. Tissue level<br>D. Organ system level | i. Pheretima<br>ii. Fasciola<br>iii. Spongilla<br>iv. Obelia |
|---|--|

Choose the correct match showing the division of labour with animal example.

- i-B, ii-C, iii-D, and iv-A
- i-B, ii-D, iii-C, and iv-A
- i-D, ii-A, iii-B, and iv-C
- i-A, ii-D, iii-C, and iv-B

**Solution:**

Option (c) is the answer.

**12. The body cavity is the cavity present between the body wall and the gut wall. In some animals, the body cavity is not lined by mesoderm. Such animals are called**

- Acoelomates
- Pseudocoelomates
- Coelomates
- Haemocoelomates

**Solution:**

Option (b) is the answer.

**13. Match the column A with column B and choose the correct option**

|  |   |
|--|---|
| <b>Column I</b><br>A. Porifera<br>B. Aschelminthes<br>C. Annelida<br>D. Arthropoda<br>E. Echinodermata | <b>Column II</b><br>i. Canal system<br>ii. Water-vascular system<br>iii. Muscular pharynx<br>iv. Jointed appendages<br>v. Metameres |
|--|---|

- A-ii, B-iii, C-v, D-iv, E-i
- A-ii, B-v, C-iii, D-iv, E-i
- A-i, B-iii, C-v, D-iv, E-ii
- A-i, B-v, C-iii, D-iv, E-ii

**Solution:**

Option (c) is the answer.

### VERY SHORT ANSWER TYPE QUESTIONS

**1. Identify the phylum in which adults exhibit radial symmetry and larva exhibit bilateral symmetry.**

**Solution:**

In the phylum Echinodermata, the radial symmetry is exhibited by the adult while the bilateral symmetry is exhibited by the larva.

**2. What is the importance of pneumatic bones and air sacs in Aves?**

**Solution:**

Pneumatic bones make their body lightweight and facilitate the flying and air sacs are helpful in respiration and buoyancy.

**3. What is metagenesis? Mention an example which exhibits this phenomenon.**

**Solution:**

The phenomenon of alternation of generations between sexual and asexual mode of reproduction is called metagenesis.

**4. What is the role of feathers?**

**Solution:**

In aves, besides pneumatic bones, feathers are also helpful in making the body weigh lighter and help in flight.

**5. Which group of chordates possess sucking and circular mouth without jaws?**

**Solution:**

Cyclostomes possess sucking and circular mouth without jaws. Since their mouth is circular and lacks jaws, they are also called agnathans.

**6. Give one example each for an animal possessing placoid scales and that with cycloid scales.**

**Solution:**

Placoid scales are the tiny tough scales that cover the skin. Examples are Trygon, Pritis

Cycloid scales are characterized by having a smooth outer margin. Examples are Catla, Clarias

**7. Mention two modifications in reptiles required for terrestrial mode of life.**

**Solution:**

Internal fertilization (makes the chances of the survival of young ones better). The body is covered with dry and cornified skin and epidermal scales.

**8. Mention one example each for animals with a chitinous exoskeleton and those covered by a calcareous shell.**

**Solution:**

Chitinous exoskeleton covers the body of cockroach (Arthropods) and calcareous shell covers the body of Pila (Molluscs).

**9. What is the role of the radula in molluscs?**

**Solution:**

The radula is a special structure in molluscs which is used to scrape and scratch the food and to create a depression in rocks which molluscs use as their habitat.

**10. Name the animal, which exhibits the phenomenon of bioluminescence. Mention the phylum to which it belongs.**

**Solution:**

The phenomenon of production and emission of light by an organism as a result of a chemical reaction during which chemical energy is converted to light energy is called bioluminescence. Members of the phylum ctenophores like Ctenoplana, Velamen, Beroe, etc.

**11. Write one example each of the following in the space provided.**

- a. Cold blooded animal \_\_\_\_\_
- b. Warm blooded animal \_\_\_\_\_
- c. Animal possessing dry and cornified skin \_\_\_\_\_
- d. Dioecious animal \_\_\_\_\_

**Solution:**

- a. Cold blooded animal: Frog (Amphibians)
- b. Warm blooded animal: Humans (Mammals)
- c. Animal possessing dry and cornified skin: Lizard (Reptiles)
- d. Dioecious animal: Ascaris (Aschelminthes)

**12. Differentiate between a diploblastic and a triploblastic animal.**

**Solution:**

Diploblastic animals are with cells arranged in two embryonic layers. Example: Coelenterates

The triploblastic animal is those which the developing embryo has a third germinal layer. Example: Chordates.

**13. Give an example of the following**

- a. Roundworm
- b. Fish possessing poison sting
- c. A limbless reptile/ amphibian
- d. An oviparous mammal

**Solution:**

- a. Roundworm: Ascaris
- b. Fish possessing poison sting: Trygon
- c. A limbless reptile/ amphibian: reptile – Snake, Amphibian – Ichthyophis
- d. An oviparous mammal: Duck-billed platypus

**14. Provide appropriate technical term in the space provided.**

- a. Blood-filled cavity in arthropods \_\_\_\_\_.
- b. Free-floating form of cnidaria \_\_\_\_\_.
- c. Stinging organ of jelly fishes \_\_\_\_\_.
- d. Lateral appendages in aquatic annelids \_\_\_\_\_.

**Solution:**

- a. A blood-filled cavity in arthropods: Haemocoel
- b. Free-floating form of cnidaria: Medusa
- c. The stinging organ of jellyfishes: Nematocyst
- d. Lateral appendages in aquatic annelids: Parapodia

**15. Match the following:**

|  |   |
|--|---|
| <b>Animals Locomotory</b><br>a. Octopus<br>b. Crocodile<br>c. Catla<br>iii.<br>d. Ctenoplana | <b>Organ</b><br>i. Limbs<br>ii. Comb plates<br>iii. Tentacles<br>iv. Fins |
|--|---|

**Solution:**

- Octopus – Tentacles
- Crocodile – Limbs
- Catla – Fins
- Ctenoplana – Comb plates

**SHORT ANSWER TYPE QUESTIONS**
**1. Differentiate between:**

- Open circulatory system and closed circulatory system
- Oviparous and viviparous characteristic
- Direct development and Indirect development

**Solution:**

- Blood is pumped out the heart and the cells and tissues are directly bathed in the open circulatory system whereas the closed circulatory system is circulated throughout the body with the help of series of vessels
- Laying of fertilized and unfertilized eggs are known as oviparous whereas giving birth to young ones is viviparous
- When a larval stage is absent in the development of the organism, it is direct development whereas the larval stage is present in the development of the organism which does not resemble the adult is called indirect development.

**2. Sort out the animals on the basis of their symmetry (radial or bilateral) coelenterates, ctenophores, annelids, arthropods, and echinoderms.**
**Solution:**

In radial symmetry, the body of an individual can be divided into equal halves by any plans passing through the longitudinal axis. Radial symmetry: Coelenterates, Ctenophores, Echinoderms  
 In bilateral symmetry, the body can be divided into two halves when the plane passes through the median longitudinal axis. Bilateral symmetry: Annelids, Arthropods.

**3. There has been an increase in the number of chambers in the heart during the evolution of vertebrates. Give the names of the class of vertebrates having two, three or four-chambered heart.**
**Solution:**

Two-chambered hearts: Chondrichytes and osteocytes

Three- chambered heart: Amphibia and Reptile

Four-chambered heart: Aves and mammalian

**4. Fill up the blank spaces appropriately**

| Phylum/Class | Excretory organ | Circulatory organ | Respiratory organ           |
|--------------|-----------------|-------------------|-----------------------------|
| Arthropoda   | A               | B                 | Lungs/Gills/Tracheal system |
| C            | Nephridia       | Closed            | Skin/parapodia              |
| D            | Metanephridia   | Open              | E                           |
| Amphibia     | F               | Closed            | Lung                        |

**Solution:**

A = Malpighian tubules

B = Open

- C = Annelida  
 D = Mollusca  
 E = Feather-like gills  
 F = Amphibians have kidneys as their excretory organs

**5. Match the following**

|   |  |
|---|--|
| <b>a. Amphibia</b><br><b>b. Mammals</b><br><b>c. Chondrichthyes</b><br><b>d. Osteichthyes</b><br><b>e. Cyclostomata</b><br><b>f. Aves</b> | <b>i. Air bladder</b><br><b>ii. Cartilaginous notochord</b><br><b>iii. Mammary glands</b><br><b>iv. Pneumatic bones</b><br><b>v. Dual habitat</b><br><b>vi. Sucking and circular mouth without jaws.</b> |
|---|--|

**Solution:**

- a. Amphibia – Dual habitat  
 b. Mammals – Mammary glands  
 c. Chondrichthyes – Cartilaginous notochord  
 d. Osteichthyes – Air bladder  
 e. Cyclostomata – Sucking and circular mouth without jaws  
 f. Aves – Pneumatic bones

**6. Endoparasites are found inside the host body. Mention the special structure, possessed by these and which enables them to survive in those conditions.**
**Solution:**

- For the survival of that condition they have to adapt:  
 High reproductive capacity  
 Presence of adhesive organs or suckers to cling on to the host.  
 Loss of digestive system.  
 Loss of unnecessary sense organs.

**7. Match the following and write correct choice in space provided**

|  |  |
|--|--|
| <b>Animal</b><br><b>a. Pila</b><br><b>b. Cockroach</b><br><b>c. Asterias</b><br><b>d. Torpedo</b><br><b>e. Parrot</b><br><b>f. Dogfish</b> | <b>Characteristics of</b><br><b>i. Jointed appendages</b><br><b>ii. Perching</b><br><b>iii. Water vascular system</b><br><b>iv. Electric organ</b><br><b>v. Presence of shell</b><br><b>vi. Placoid scales</b> |
|--|--|

- a. \_\_\_\_\_, b. \_\_\_\_\_, c. \_\_\_\_\_, d. \_\_\_\_\_, e. \_\_\_\_\_, f. \_\_\_\_\_,

**Solution:**

- a. Pila – Presence of shell  
 b. Cockroach – Jointed appendages  
 c. Asterias – Water vascular system  
 d. Torpedo – Electric organ  
 e. Parrot – Perching  
 f. Dogfish – Placoid scales

**8. Differentiate between:**

- a. Open and closed circulatory system**
- b. Oviparity and viviparity**
- c. Direct and indirect development**
- d. Acoelomate and pseudocoelomate**
- e. Notochord and nerve cord**
- f. Polyp and medusa**

**Solution:**

- a) Blood is pumped out the heart and the cells and tissues are directly bathed in the open circulatory system whereas the closed circulatory system is circulated throughout the body with the help of series of vessels
- b) Laying of fertilized and unfertilized eggs are known as oviparous whereas giving birth to young ones is viviparous
- c) When a larval stage is absent in the development of the organism, it is direct development whereas the larval stage is present in the development of the organism which does not resemble the adult is called indirect development.
- d) The animal possessing no coelom are called coelomates whereas the body cavity lined by mesoderm instead mesoderm is present in between ectoderm and endoderm are called pseudocoelomate.
- e) The notochord is mesodermally derived rod-like structure formed on the dorsal side during embryonic development whereas the nerve cord is a solid strand of nervous tissue
- f) Polyp is a sessile and cylindrical form like Hydra whereas Medusa is an umbrella-shaped and free-swimming like jellyfish

**9. Give the characteristic features of the following citing one example of each**

- a. Chondrichthyes and Osteichthyes**
- b. Urochordata and cephalochordate**

**Solution:****Chondrichthyes**

Their habitat is mainly marine and their body is streamlined. They have a cartilaginous endoskeleton. Examples are scyliorhinus and Trygon

**Osteichthyes**

The habitat is both marines as well as freshwater and they have a streamlined body. The endoskeleton is bony.

Examples are Marine: Hippocampus (Sea horse), Freshwater: Labeo (Rohu), Aquarium: Betta (Fighting fish)

**b) Urochordata and cephalochordate**

In urochordates, the notochord is present only in the larval tail but in cephalochordates, notochord extends from head to tail region and is persistent throughout the life.

- Examples – Urochordates: Ascidia, Salpa, Cephalochordates: Branchiostoma.

**10. Mention two similarities between**

- a. Aves and mammals**
- b. A frog and crocodile**
- c. A turtle and pila**



**Solution:**

- a) Aves and mammals are warm-blooded and have 4 chambered heart
- b) A frog and crocodile are cold-blooded and are oviparous
- c) Turtle and pilla are cold-blooded and are oviparous animals

**11. Name**

- a. A limbless animal
- b. A cold-blooded animal
- c. A warm-blooded animal
- d. An animal possessing dry and cornified skin
- e. An animal having a canal system and spicules
- f. An animal with cnidoblasts

**Solution:**

- a. A limbless animal – Ichthyophis
- b. A cold-blooded animal - Trygon
- c. A warm-blooded animal – Macaca (monkey)
- d. An animal possessing dry and cornified skin – Naja (Cobra)
- e. An animal having a canal system and spicules – Euspongia
- f. An animal with cnidoblasts – Hydra

**12. Give an example for each of the following**

- a. A viviparous animal
- b. A fish possessing a poison sting
- c. A fish possessing an electric organ
- d. An organ, which regulates buoyancy
- e. Animal, which exhibits alternation of generation
- f. An oviparous animal with mammary gland

**Solution:**

- a. A viviparous animal – Panthera leo
- b. A fish possessing a poison sting – Trygon
- c. A fish possessing an electric organ – Torpedo
- d. An organ, which regulates buoyancy – Air bladder
- e. Animal, which exhibits alternation of generation – Obelia
- f. The oviparous animal with mammary gland – Echidna

**13. Excretory organs of different animals are given below. Choose correctly and write in the space provided.**

| Animal Excretory Organ/Unit | Animal Excretory Organ/Unit |
|-----------------------------|-----------------------------|
| a. Balanoglossus            | i. Metanephridia            |
| b. Leech                    | ii. Nephridia               |
| c. Locust                   | iii. Flame cells            |
| d. Liver fluke              | iv. absent                  |
| e. Sea urchin               | v. malpighian tubule        |
| f. Pila                     | vi. Probosci's gland        |

- a. \_\_\_\_\_, b. \_\_\_\_\_, c. \_\_\_\_\_  
 d. \_\_\_\_\_, e. \_\_\_\_\_, f. \_\_\_\_\_

**Solution:**

- a. Balanoglossus – Proboscis gland  
 b. Leech – Nephridia  
 c. Locust – Malpighian tubule  
 d. Liver fluke – Flame cells  
 e. Sea urchin – Absent  
 f. Pila – Metanephridia

**LONG ANSWER TYPE QUESTIONS**

**1. Give three major differences between chordates and non-chordates and draw a schematic sketch of a chordate showing those features.**

**Solution:**

| Chordates                             | Non-Chordates                    |
|---------------------------------------|----------------------------------|
| Have notochord                        | Don't have a notochord           |
| The tail is present at some stage     | Tail is absent                   |
| Heart is ventral                      | Heart is dorsal                  |
| CNS is dorsal                         | CNS is central, solid and double |
| Gill slits are present in the pharynx | Gill slits are absent            |

**2. What is the relationship between germinal layers and the formation of the body cavity in case of coelomate, acoelomates and pseudocoelomates?**

**Solution:**

Germinal layers are those which formed during the process of gastrulation. The outer layer of germ is called ectoderm, the middle one is endoderm and the innermost is the endoderm. Coelomates are the organisms possessing coeloms. The coelom is the body cavity lined by the mesoderm. Examples of coelomates are phylum Annelida, Mollusca, arthropods, etc. The organisms with absent body cavities are called acoelomates. E.g. Platyhelminthes. Some of the organisms do not have a lining by mesoderm. Instead of that, it will be in the form of a scattered pouch in between ectoderm and endoderm. Such a body cavity is called pseudocoelom and animals possessing pseudocoelom are referred to as pseudocoelomates e.g., Ascaris.

**3. Comment upon the habitats and external features of animals belonging to class, amphibia and reptilia.**

**Solution:**
**Amphibia**

They are thin and have smooth skin which can live on both land and water. Their eyes have eyelids and have a pair of limbs. A tympanum is representing the ears. Examples are Rana(frog) and cobra

**Reptiles**

They are covered with dry and confined skin and scales. They mostly live on land. Tympanum represents ear. They have a pair of limbs. They will creep and crawl. These category organisms are oviparous, fertilization is internal and development is direct or indirect.

Examples are crocodile, turtle etc

**4. Mammals are most adapted among the vertebrates. Elaborate.****Solution:**

Mammals are found in a variety of habitats like deserts, plains and mountains. They differ in the type of jaws and sexes are separate and fertilization is internal. They have pairs of limbs which are used for walking, burrowing, climbing etc. Their mammary glands produce milk to nourish their young ones. They are warm-blooded which helps them maintain their body temperature in different weather conditions. They have hair-like structures which act as insulation against cold. The 4-chambered heart is present in mammals. The brains are more developed. Examples of Mammals: Humans, Whales, Dogs, Camels, etc



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