

CHAPTER 4

ANIMAL KINGDOM

NCERT EXERCISE AND SOLUTIONS - BIOLOGY

Q. 1. What are the difficulties that you would face in classification of animals, if common fundamental features are not taken into account?

ANSWER:-

The classification of living organisms is based on shared fundamental characteristics. Considering only specific traits would result in grouping each organism separately, defeating the purpose of classification.

Classifying animals is essential for comparing different species and assessing their evolutionary significance. Relying on a single characteristic would fail to achieve this objective.

Q. 2. If you are given a specimen, what are the steps that you would follow to classify it?

ANSWER:-

Certain shared fundamental features aid in the classification of living organisms. The characteristics used for classification include the following:

- (i) Level of classification
 - Cellular level
 - Tissue level
 - Organ level
- (ii) Body cavity
 - Absent
 - Present
- (iii) Type of body symmetry
 - Radial
 - Bilateral
- (iv) Type of coelom development
 - Acoelom
 - Pseudocoelom
 - True coelom
- (v) Type of true coelom
 - Enterocoelom
 - Schizocoelom



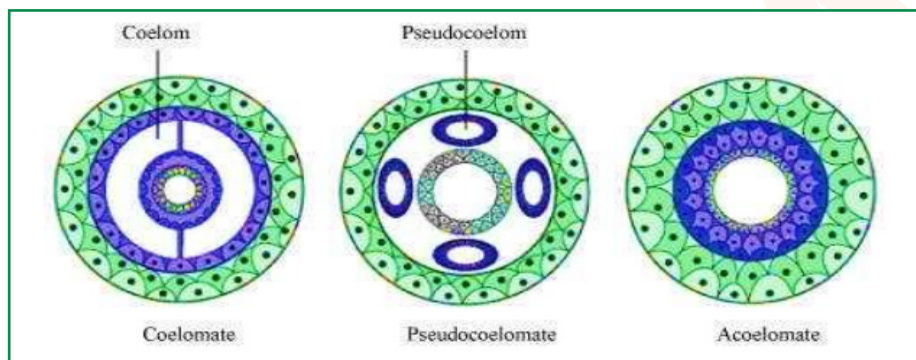
Q. 3. How useful is the study of the nature of body cavity and coelom in the classification of animals?

ANSWER:-

The coelom is a fluid-filled cavity located between the body wall and the digestive tract. The presence or absence of this cavity is a crucial factor in the classification of animals.

- **Coelomates:** Animals with a body cavity fully lined by mesoderm are called coelomates. Examples include annelids, mollusks, arthropods, echinoderms, and chordates.
- **Pseudocoelomates:** Animals that lack a mesodermal lining around the body cavity are called pseudocoelomates. In these organisms, the mesoderm is scattered between the ectoderm and endoderm. Aschelminthes is an example.
- **Acoelomates:** Animals without any body cavity are termed acoelomates. Platyhelminthes serves as an example of this group.

This classification highlights the structural organization and evolutionary relationships among different animal groups.



Q. 4. Distinguish between intracellular and extracellular digestion?

ANSWER:-

Intracellular Digestion	Extracellular Digestion
1. Digestion occurs inside the cell.	1. Digestion takes place within the cavity of the alimentary canal.
2. Digestive enzymes are released by the cytoplasm into food vacuoles.	2. Digestive enzymes are secreted by specialized cells into the alimentary canal.
3. Digested nutrients are absorbed directly into the cytoplasm.	3. Digested nutrients diffuse through the intestinal wall into the body.
4. This method is less efficient.	4. This method is more efficient.
5. Found in unicellular organisms.	5. Found in multicellular organisms.



Q. 5. What is the difference between direct and indirect development?

ANSWER:-

Direct Development	Indirect Development
1. In this type of development, the embryo matures directly into an adult without passing through a larval stage.	1. This type of development includes a sexually immature larval stage with distinct feeding habits from the adult.
2. Metamorphosis is not involved.	2. Metamorphosis occurs, transforming the larva into a sexually mature adult.
3. Observed in fishes, reptiles, birds, and mammals.	3. Observed in most invertebrates and amphibians.

Q. 6. What are the peculiar features that you find in parasitic platyhelminthes?

ANSWER:-

Taenia (tapeworm) and *Fasciola* (liver fluke) are parasitic platyhelminthes characterized by the following distinct features:

- Their body is dorsoventrally flattened and equipped with hooks and suckers to securely attach to the host's internal organs.
- A thick tegument covers their body, providing protection against the host's digestive enzymes.
- The tegument also facilitates the absorption of nutrients directly from the host's body.

Q. 7. What are the reasons that you can think of for the arthropods to constitute the largest group of the animal kingdom?

ANSWER:-

The phylum Arthropoda includes over two-thirds of all animal species on Earth. The success of arthropods can be attributed to the following features:

- Jointed legs that enhance mobility on land.
- A tough exoskeleton made of chitin, which provides protection.
- The exoskeleton also minimizes water loss, making arthropods well-adapted to terrestrial environments.

Q. 8. Water vascular system is the characteristic of which group of the following:

- Porifera
- Ctenophora
- Echinodermata
- Chordata

ANSWER:-

- The water vascular system, a distinctive feature of the phylum Echinodermata, comprises a network of radiating channels, tube feet, and a madreporite. This system plays a vital role in locomotion, capturing food, and respiration.



Q. 9. “All vertebrates are chordates, but all chordates are not vertebrates”. Justify the statement.

ANSWER:-

The phylum Chordata is defined by the presence of a notochord and paired pharyngeal gill slits. In the sub-phylum Vertebrata, the notochord found in embryos is replaced by a cartilaginous or bony vertebral column in adults. Therefore, while all vertebrates are chordates, not all chordates are vertebrates.

Q. 10. How important is the presence of air bladder in Pisces?

ANSWER:-

The gas bladder, or air bladder, is a gas-filled sac found in fishes. It aids in maintaining buoyancy, allowing fishes to rise or sink and remain stable in the water current.

Q. 11. What are the modifications that are observed in birds that help them fly?

ANSWER:-

Birds have developed various structural adaptations to thrive in their aerial environment. Some of these adaptations include:

- A streamlined body for swift and smooth movement
- Feathers for insulation
- Forelimbs modified into wings, while hind limbs are used for walking, perching, and swimming
- Pneumatic bones to minimize weight
- Additional air sacs to enhance respiration

Q. 12. Could the number of eggs or young ones produced by an oviparous and viviparous mother be equal? Why?

ANSWER:-

Oviparous mothers produce more eggs than viviparous mothers because in oviparous animals, the development of young ones occurs outside the mother's body. The eggs are more vulnerable to environmental factors and predators. To compensate for this, oviparous animals produce a larger number of eggs, increasing the chances that some will survive and hatch even in harsh conditions. In contrast, viviparous organisms develop their young ones inside the mother's body, offering a safer environment. As a result, the young are less exposed to environmental threats and predators, leading to a higher survival rate and, therefore, fewer offspring are produced compared to the number of eggs.

Q. 13. Segmentation in the body is first observed in which of the following:

- (a) Platyhelminthes
- (b) Aschelminthes



- (c) Annelida
(d) Arthropoda

ANSWER:-

(c) Body segmentation first emerged in the phylum Annelida (from “annulus,” meaning little ring).

Q. 14. Match the following:

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|-----------------|--------------------------------------|
| (a) Operculum | (i) Ctenophora |
| (b) Parapodia | (ii) Mollusca |
| (c) Scales | (iii) Porifera |
| (d) Comb plates | (iv) Reptilia |
| (e) Radula | (v) Annelida |
| (f) Hairs | (vi) Cyclostomata and Chondrichthyes |
| (g) Choanocytes | (vii) Mammalia |
| (h) Gill slits | (viii) Osteichthyes |

ANSWER:-

- (a) – (viii)
(b) – (v)
(c) – (iv)
(d) – (i)
(e) – (ii)
(f) – (vii)
(g) – (iii)
(h) – (vi)

Q. 15. Prepare a list of some animals that are found parasitic on human beings

ANSWER:-

S. No.	Name of organism	Phylum
1	<i>Taenia solium</i>	Platyhelminthes
2	<i>Fasciola hepatica</i>	Platyhelminthes
3	<i>Ascaris lumbricoides</i>	Aschelminthes
4	<i>Wuchereria bancrofti</i>	Aschelminthes
5	<i>Ancylostoma</i>	Aschelminthes

