NCERT Solutions for Class-XI Biology

Chapter-4

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

1. The common fundamental features used for classifying animals include body symmetry, arrangement of cells, nature of coelom, level of organisation. Animal classification would be very confusing if fundamental features are not considered.

(i) Animals having different levels of organisation would have been placed in same group. E.g., Sponges and Cnidarians having cellular and tissue level of organisation respectively.

(ii) Animals showing varied types of germinal layers would have been placed together, as diploblastic cnidarians and triploblastic platyhelminthes.

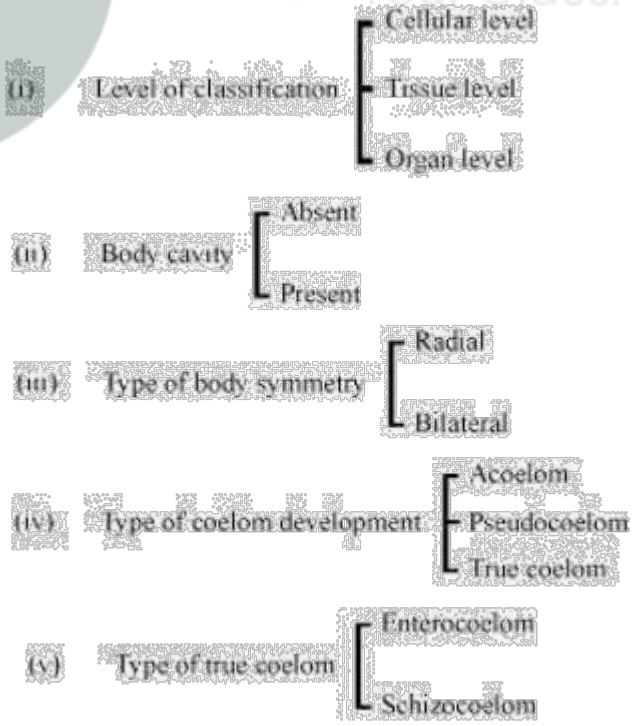
(iii) Animals having different body symmetry would have been placed together, as coelenterates with radial symmetry and platyhelminthes with bilateral symmetry.

(iv) There would have been no classification of animals based on with or without body cavity.

(v) Placing of oviparous and viviparous animals together.

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

2. There is a certain common fundamental feature that helps in classification of living organisms. The features that can be used in classification are as follows.



On the basis of above features, we can easily classify a specimen into its respective category.

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

3. Organisms can be classified according to presence or absence of the coelom. The body cavity, which is lined by mesoderm is called coelom. Animals possessing coelom are called coelomates, e.g., annelids, molluscs, arthropods, echinoderms, hemichordates and chordates. In some animals, the body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. Such a body cavity is called pseudocoelom and the animals possessing them are called pseudocoelomates, e.g., aschelminthes. In pseudocoelomates, body cavity is derived from blastocoel of the embryo. The animals in which the body cavity is absent are called acoelomates, e.g., platyhelminthes.

4. Distinguish between intracellular and extracellular digestion?

4.

Intracellular digestion		Extracellular digestion	
1.	The digestion of food occurs within the cell.	**1.**	The digestion occurs in the cavity of alimentary canal.
2.	Digestive enzymes are secreted by the surrounding cytoplasm into the food vacuole.	**2.**	Digestive enzymes are secreted by special cells into the cavity of alimentary canal.
3.	Digestive products are diffused into the cytoplasm.	**3.**	Digestive products diffuse across the intestinal wall into various parts of the body.
4.	It is a less efficient method.	**4.**	It is a more efficient method of digestion.
5.	It occurs in unicellular organisms.	**5.**	It occurs in multicellular organisms.

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

5. Differences between direct development and indirect development are :

	Direct development	Indirect development
(i)	Young ones may resemble the adult	In this young hatchlings (larvae) do not resemble the adult.
(ii)	Intermediate stages are absent.	Intermediate stages are present.
(iii)	Metamorphosis is absent.	Metamorphosis is seen in indirect development.
	e.g., Hydra, man	e.g., Frog, cockroach

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

6. *Taenia* (Tapeworm) and Fasciola (liver fluke) are examples of parasitic platyhelminthes.

Peculiar features in parasitic platyhelminthes are as follows.

- They have dorsiventrally flattened body and bear hooks and suckers to get attached inside the body of the host.
- Their body is covered with thick tegument, which protects them from the action of digestive juices of the host.
- The tegument also helps in absorbing nutrients from the host's body.

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

7. Arthropods are most successful animals and constitute the largest group of the animal kingdom. They have conquered land, sea and air and make up over three fourth of currently known living and fossil organisms. They range in distribution from deep sea to mountain peaks. Thick, tough, non-living chitinous cuticle forms the exoskeleton which protects the organism from predators, help to withstand temperature upto 100°C or more and prevents water loss. They have ability to reproduce very fast and less time is needed for young ones to hatch from their eggs. Due to metamorphosis, there is less competition among larval and adult forms for food. Cockroaches can even survive nuclear radiations and poisoned earth. All these factors made arthropods the largest phylum among animals.

8. Water vascular system is the characteristic of which group of the following:
(a) Porifera (b) Ctenophora (c) Echinodermata (d) Chordata

8. Water vascular system is a characteristic feature of the phylum, Echinodermata. It consists of an array of radiating channels, tube feet, and madreporite. The water vascular system helps in locomotion, food capturing, and respiration.

9. "All vertebrates are chordates but all chordates are not vertebrates". Justify the statement.

9. Chordates are the animals that possess notochord (a stiff, supporting rod like structure present on the dorsal side) at some stage of their lives. Phylum Chordata is divided into three Subphyla: Urochordata or tunicata, Cephalochordata and Vertebrata. Subphyla Urochordata and Cephalochordata are often referred to as protochordates and are exclusively marine. In urochordata, notochord is present only in tail of larva and disappears in adults, while in cephalochordata, it extends from head to tail region and persists throughout the life.

The members of Subphylum Vertebrata a possess notochord during the embryonic period and is replaced by a cartilaginous or bony vertebral column in the adult. Thus all vertebrates are chordates but all chordates are not vertebrates.

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

10. Gas bladder or air bladder is a gas filled sac present in fishes. It helps in maintaining buoyancy. Thus, it helps fishes to ascend or descend and stay in the water current.

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

11. Birds have undergone many structural adaptations to suit their aerial life. Some of these adaptations are as follows.

- Streamlined body for rapid and smooth movement
- Covering of feathers for insulation
- Forelimbs modified into wings and hind limbs used for walking, perching, and swimming
- Presence of pneumatic bones to reduce weight
- Presence of additional air sacs to supplement respiration

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

12. The numbers of eggs produced by an oviparous mother will be more than the young ones produced by a viviparous mother. This is because in oviparous animals, the development of young ones takes place outside the mother's body. Their eggs are more prone to environmental conditions and predators. Therefore, to overcome the loss, more eggs are produced by mothers so that even under harsh environmental conditions, some eggs might be able to survive and produce young ones. On the other hand, in viviparous organisms, the development of young ones takes place in safe conditions inside the body of the mother. They are less exposed to environmental conditions and predators. Therefore, there are more chances of their survival and hence, less number of young ones is produced compared to the number of eggs.

13. Segmentation in the body is first observed in which of the following:
(a) Platyhelminthes (b) Aschelminthes (c) Annelida (d) Arthropoda

13. (c) Annelida

14. Match the following:

(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

14.

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

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

15. List of some animals that are found parasitic on human beings :

Parasite	Nature Endoparasites	Organ
Taenia solium (Pork Tapeworm)	Endoparasites	Small intestine
Schistosoma (Blood fluke)	Endoparasites	Hepatic portal system and mesenteric blood vessels.
Ancylostoma duodenale (Hook worm)	Endoparasites	Small intestine
Wuchereria (Filarial worm)	Endoparasites	Lymph nodes and lymphatic vessels.

Enterobius (Pin worm)	Endoparasites	Colon, caecum or vermiform appendix