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## 4. Animal kingdom

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

Answer:

- I. There are a number of animal species which display a great variety of life. The common characters are considered for the classification of these animals. If the thing is not done, it is not possible to deal with every living organism separately at individual level. A classification is based on the common fundamental characters to study the diversity properly.
- II. The interrelationship between the animals will not be traceable.
- III. The picture of animals at a glance will not be displayed.

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

Answer: Various steps to classify a specimen are:

Mode of nutrition: Can be autotrophic, holozoic, saprophytic or parasitic.

1. Complexity of body structure: The specimen can be unicellular or multicellular.
2. Presence or absence of membrane bound organelles.
3. The body symmetry: Bilateral or Radial
4. Presence or absence of coelom.
5. Phylogenetic relationship

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

Answer: Coelom is the fluid filled space between the body wall and the gut wall which is lined by the mesoderm on all the sides. The presence or absence of body cavity plays a role in classifying organisms. The animals having fluid filled body cavity between body wall and digestive tract are known as coelomates. For example, Annelids, Molluscs, Arthropods, Echinoderms and chordates. The body of the animals where the body cavity is not lined by mesoderm are pseudocoelomates such as Aschelminthes. The body cavity is not lined by mesoderm and is scattered in between ectoderm and endoderm. The animals where body cavity is present are known as coelomates such as Platyhelminthes.

**Question 4. Distinguish between intracellular and extracellular digestion?**

Answer:

Intracellular digestion	Extracellular digestion
Digestion occurs in the food vacuoles in cells.	Digestion occurs outside the cells of the lumen of alimentary canal.
Lysosomal enzymes are secreted in the food vacuole.	The enzymes are secreted in the digestive cavity.
Products of digestion diffuse into the cytoplasm by the vacuolar membrane.	The digested materials are absorbed in the blood by gut epithelia.
Ingestion occurs by pinocytic vesicles. Example, protozoans, sponges and coelenterates.	Ingestion occurs by mouth. Example, coelenterates to chordates.

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

Answer:

Direct development	Indirect development
The embryo develops into a mature individual without involving a larval stage.	The sexually immature larva is present.
Metamorphosis is absent.	Metamorphosis is present where development into adult occurs.
It is seen in fishes, reptiles, birds, mammals.	It is seen in invertebrates and amphibians.

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

Answer: The main features are:

1. The presence of dorso-ventrally flattened body, known as flatworms.
2. Hooks and suckers are present, which help in absorbing nutrients from the host through their body surface.
3. Flame cells are present, which helps in osmoregulation and excretion.
4. No respiratory structures.
5. Some members like *Planaria* have high regeneration capacity.
6. Example: Tapeworm, Liver fluke.

**Question 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 arthropods constitute about 80% of the total animals in the animal kingdom.

- (i) Jointed legs allow more mobility on land.
- (ii) Hard exoskeleton which is made up of chitin protects the body.
- (iii) Hard exoskeleton reduces water loss from the body and making more adapted to terrestrial conditions.
- (iv) Pheromones are exhibited that enable communication.
- (v) Well-developed sense organs and nervous system.

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

**(a) Porifera (b) Ctenophora (c) Echinodermata (d) Chordata**

Answer: Echinodermata

Water vascular system is the characteristic of the Echinodermata. The water vascular system helps in functions like locomotion, capturing food, respiration, etc.

**Question 9. “All vertebrates are chordates but all chordates are not vertebrates”. Justify the statement.**

Answer: All the chordates have a notochord. Chordates include Urochordates, Cephalochordates (both are called protochordates) and vertebrates. In vertebrates notochord is replaced by vertebral column (backbone), but vertebral column is absent in protochordates. Therefore, all vertebrates are chordates but all chordates are not vertebrates.

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

Answer: Air bladder in pisces regulates buoyancy and floats in the water. It prevents them from sinking. The air bladder is present in members of the class Osteichthyes. The animals of Chondrichthyes do not have air bladder and in absence of air bladder, the animals have to swim constantly to avoid sinking.

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

Answer: Birds have undergone many structural adaptations to suit their aerial life. The adaptations are :

- (i) Streamlined body for rapid and smooth movement.
- (ii) Covering of feathers for insulation.
- (iii) Forelimbs modified into wings and hind limbs used for walking, perching, and swimming.
- (iv) Presence of pneumatic bones to reduce weight.
- (v) Presence of air sacs to supplement respiration.

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

Answer: The number of eggs produced by an oviparous or viviparous mother cannot be equal.

Oviparous mother gives rise to more number of eggs as some of them die during hatching and as they have to pass through a number of developmental stages before becoming an adult.

Viviparous mother gives rise to fewer number of young ones because there are less chances of their death. They don't have to pass through any larval stage.

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

Answer: The body segmentation was first seen in the phylum Annelida. The annelid body is divided into a linear series of cylindrical segments, or metameres. Each metamere possess a section of the body wall and a compartment of the body cavity with its internal organs.

**Question 14. Match the following:**

Column I	Column II
(a) Operculum	(i) Ctenophore
(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:

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

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

Answer: Some of the parasitic animals in humans are:

1. *Taenia solium* (Tape worm) – Platyhelminthes
2. *Fasciola hepatica* (Blood worm) – Platyhelminthes
3. *Ascaris lumbricoides* (Round worm) – Aschelminthes
4. *Wuchereria bancrofti* (Filarial worm) - Aschelminthes