CHAPTER 10 : KINGDOM ANIMALIA
EXERCISE : SHORT QUESTION AND ANSWER

Q1) Write distinct features of animals ?

Animals are multicellular, eukaryotic organisms that lack cell walls, distinguishing them from plants and fungi. They are heterotrophic, meaning they obtain food by consuming other organisms. Most animals exhibit locomotion at some stage of life and respond to environmental stimuli. They have specialized tissues such as nervous and muscular systems, enabling complex functions. Sexual reproduction is predominant, but some species also reproduce asexually.

Q2) Describe the body layers of sponges ?

Sponges have two primary body layers: the outer layer (pinacoderm) and the inner layer (choanoderm). The pinacoderm is made of flat cells called pinacocytes, which provide structural support. The choanoderm contains flagellated choanocytes, which help in water flow and capturing food particles. Between these layers lies the mesophyll, a jelly-like matrix containing cells such as amoebocytes, which perform digestion and other functions.

Q3) What are nematocysts ?

Nematocysts are specialized stinging organelles found in the cells of cnidarians, such as jellyfish and sea anemones. They consist of a capsule containing a coiled thread that can rapidly uncoil and penetrate the skin of prey or predators. When triggered, nematocysts inject venom to immobilize prey or defend against threats. These structures are essential for capturing food and protecting the organism.

Q4) Give three features of platyhelminthes for a parasitic mode of life ?

Platyhelminthes, like tapeworms, have a flat, dorsoventral body that enables them to attach to hosts effectively. They possess hooks or suckers for anchoring to the host's tissues. Their digestive system is either reduced or absent, as they directly absorb nutrients from the host's body. Additionally, they have a high reproductive capacity to ensure survival within hosts.

Q5) Give three distinguishing features of Aschelminthes ?

Aschelminths, or nematodes, have a cylindrical, elongated, and unsegmented body covered by a tough, non-living cuticle. They are pseudocoelomates, meaning their body cavity is not fully lined by mesoderm. Most are dioecious, having separate sexes, with highly efficient reproductive systems that produce a large number of eggs. They can live in diverse habitats, including soil, water, and as parasites in hosts.

Q6) How locomotion takes place in Annelids ?

Locomotion in annelids, such as earthworms, involves the coordinated action of their circular and longitudinal muscles. These muscles work together with the hydrostatic skeleton, where the fluid-filled segments provide structure. Movement is further aided by setae, small bristle-like structures on their segments, which provide grip in the soil. This helps them crawl or burrow efficiently.

Q7) Write five salient features of phylum Arthropoda ?

Arthropods are characterized by their segmented bodies, divided into the head, thorax, and abdomen. They have an external exoskeleton made of chitin, providing protection and preventing water loss. Their jointed appendages allow a wide range of movements. They possess an open circulatory system, and their body cavity is filled with hemolymph. Arthropods exhibit remarkable diversity and include insects, arachnids, and crustaceans.

Q8) List any four harmful roles of insects ?

Insects play several harmful roles in ecosystems and human life. They act as vectors for diseases, such as mosquitoes spreading malaria and dengue. Agricultural pests, like locusts, destroy crops and reduce food production. Some, like termites, cause structural damage to buildings and wood. Houseflies contaminate food by spreading bacteria and pathogens.

Q9) List the similarities between echinoderms and chordates ?

Echinoderms and chordates share several similarities as they are both deuterostomes. Their embryonic development involves radial cleavage, and they possess a true coelom. Both have an internal skeleton, though echinoderms have a calcareous one, while chordates have a bony or cartilaginous one. Bilateral symmetry is observed in their larval stages, and both groups exhibit complex organ systems.

Q10) What does the term amphibian mean? Why are they not considered a very successful group ?

The term "amphibian" means dual life, referring to their ability to live both in water and on land. Amphibians are dependent on water for reproduction, as their eggs lack shells and require a moist environment to develop. They are not considered highly successful vertebrates because they have limited adaptability to dry environments and are highly sensitive to environmental changes, leading to population decline.

Q11) Describe how amphibians are adapted to life on land and why they are still restricted to moist environments ?

Amphibians have evolved lungs for breathing air and limbs for movement on land. Their skin, which plays a role in respiration, is thin and must remain moist to function efficiently. However, this reliance on moist skin for gas exchange and their requirement for water to reproduce restrict them to wet or humid habitats. They cannot thrive in arid environments due to these limitations.

Q12) List adaptations that distinguish reptiles from amphibians and help them in dry environments ?

Reptiles are better adapted to dry environments due to their tough, scaly skin, which prevents water loss. They lay amniotic eggs with protective shells that can develop on land without drying out. Reptiles also have efficient lungs and kidneys to conserve water. These adaptations allow them to inhabit arid and terrestrial ecosystems more successfully than amphibians.

Q13) Give an example of ectothermic and endothermic animals ?

Ectothermic animals are those whose body temperature depends on the environment. Examples include reptiles like lizards. Endothermic animals maintain a constant body temperature regardless of their surroundings. Examples include mammals like humans and birds like pigeons.

Q14) Name two phyla of animals that are radially symmetrical and two that are bilaterally symmetrical ?

Radially symmetrical animals include members of phyla Cnidaria (e.g., jellyfish) and Echinodermata (e.g., starfish in adult form). Bilaterally symmetrical animals include members of phyla Platyhelminthes (e.g., flatworms) and Arthropoda (e.g., insects and crustaceans).

Q15) List the vertebrate class (or classes) in which we find each of the following:

a) **A two-chambered heart:** Found in class Pisces (fishes).
b) **The amniotic egg:** Found in classes Reptilia, Aves (birds), and Mammalia.
c) **A four-chambered heart:** Found in classes Aves and Mammalia.
d) **Lungs supplemented by air sacs:** Found in class Aves (birds).
e) **Placenta:** Found in class Mammalia (eutherian mammals).

Q16) Write three main differences between prototheria, metatheria, and eutheria.?

Ans)

Characteristic	Prototheria	Metatheria	Eutheria
Reproduction	Lay eggs (oviparous).	Give birth to underdeveloped young (viviparous) that develop in a pouch.	Give birth to fully developed young (viviparous).
Examples	Platypus, echidna.	Kangaroos, opossums.	Humans, dogs, elephants.
Placenta	Lack a true placenta.	Have a simple or rudimentary placenta.	Have a well-developed placenta for nurturing the fetus.

Q17) How do mammals differ from birds ? What adaptations do they share ?

Mammals have hair or fur, mammary glands for feeding their young, and give birth to live young (except monotremes). Birds have feathers, lay hard-shelled eggs, and lack mammary glands. Both groups are endothermic, have a four-chambered heart, and show adaptations for diverse environments, like flight in birds and advanced locomotion in mammals.

Q18) Define/Describe/Explain briefly:

a) **Animals:** Multicellular, eukaryotic organisms lacking cell walls; they are heterotrophic and exhibit complex behaviors.
b) **Diploblastic animals:** Animals with two germ layers (ectoderm and endoderm), like cnidarians.
c) **Triploblastic animals:** Animals with three germ layers (ectoderm, mesoderm, and endoderm), like humans and earthworms.

d) **Radial symmetry:** Body parts arranged around a central axis, as in starfish and jellyfish.
e) **Bilateral symmetry:** Body divided into two equal halves along one plane, as in humans and insects.
f) **Coelom:** A body cavity fully lined by mesoderm, found in animals like annelids and mammals.
g) **Nematocyst:** Stinging cells in cnidarians used for defense and capturing prey.
h) **Mesoglea:** A jelly-like layer between the ectoderm and endoderm in cnidarians.
i) **Zooid:** Individual units in colonial organisms like corals and bryozoans.
j) **Radula:** A tongue-like structure with rows of teeth, found in mollusks for scraping food.
k) **Trochophore larva:** A free-swimming larval stage found in annelids and molusca
l) **Parapodia:** Paired lateral appendages in polychaetes, used for locomotion.
m) **Haemocoel:** A blood-filled cavity in arthropods and mollusks for circulation.
n) **Metamorphosis:** A biological process in which an organism transforms from a larva to an adult, e.g., in butterflies.
o) **Water vascular system:** A hydraulic system in echinoderms used for movement, feeding, and respiration.
p) **Notochord:** A flexible, rod-like structure present in chordate embryos, providing support.
q) **Swim bladder:** An air-filled sac in bony fish that aids buoyancy.
r) **Amnion:** A membrane that forms a fluid-filled sac around the embryo in reptiles, birds, and mammals.
s) **Placenta:** An organ in eutherian mammals that facilitates nutrient and gas exchange between mother and fetus.