CHAPTER – 4

ANIMAL KINGDOM

EXERCISES

2 Mark Questions

Q1: Water vascular system is the characteristic of which group of the following:

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

Answer:From the four given options the correct answer is (c) Echinodermata

This is their characteristic. A perforated panel in them, known as madreporite, allows water to percolate in their systems.

Q2: How important is the presence of air bladder in Pisces?

Answer:Air bladder in Pisces regulates Buoyancy, which prevents fish from sinking.

Q3: Segmentation in the body is first observed in which of the following?

(a) Platyhelminthes (b) Aschelminthes (c) Annelida (d) Arthropoda

Answer:From the four given options, the correct answer is (c) Annelida

Q4: Prepare a list of some animals that are found parasitic on human beings.

Answer:Some animals that are found parasitic in humans are as follows:

i. Ancylostoma (Hookworm)

ii. Taenia (Tapeworm)

iii. Enterobius (Pinworm)

iv. Wuchereria (Filarial worm)

v. Ascaris (Roundworm)

Q5: What is mesoglea? Where is it found?
Answer:Mesoglea is an undifferentiated layer present in between ectoderm and endoderm. It is found in Coelenterates.

Q6: When is the development of an organism called indirect?
Answer:The development of an organism is called indirect when a larval stage (birth form) is morphologically distinct from an adult.

Q7: Name the arthropod which is an (i) Living fossil, (ii) Gregarious pest.
Answer:

(i) Living fossil: - Limulus (King crab),

(ii) Gregarious pest: - Locusta (Locust).

Q8: What is metamerism?
Answer:

In some Bilateria, the body consists of many segments & shows repetitions of parts. This type of segmentation is called metamerism.

Q9: What are flame cells?
Answer:Flame cells are excretory organs found in Platyhelminthes and related animals. They have flickering cilia or flagella that move the absorbed excretory products into a system of ducts.

Q10:What is polymorphism?
Answer:The phenomenon when an organism has different kinds of zooids for different functions is called polymorphism.

4 Mark Questions

Q1:Define metagenesis with a suitable example.
Answer:Metagenesis is the phenomenon of alternation of generations between sexual and asexual modes of reproduction. Cnidarians have two forms in their life cycle: - the polyp form and the medusa form. Polyps (sporophyte) produces medusa asexually whereas the medusa (gametophyte) produces the polyp sexually. Example: - Obelia.

Q2: List any four identifying features of Arthropoda & give examples.
Answer: Four identifying features of Arthropoda are: -
(i) Animals with jointed appendages;

(ii) Triploblastic, coelomate, and bilaterally symmetrical animals;

(iii) The body of animals is covered by a chitinous cuticle (hard exoskeleton), and segments are not separated by septa.

(iv) Arthropods are unisexual animals.

(v) Examples include Crab, Apis, Spider and Anopheles.

Q3: What are protochordates? How is it classified?
Answer: Protochordate is an organism that belongs to the lower chordates and is generally found in marine water. Their body is bilaterally symmetrical, triploblastic, and coelomate. At a certain stage of their lives, their bodies develop a long, rod-like structure called the notochord. There are three subphyla: -

(i) Hemichordata (Half chordate)

Example: - Balanoglossus

(ii) Urochordata (Tail cord)

Example: - Salpa & Herdmania

(iii) Cephalochordata (Head cord)

Example: - Amphioxus

Q4:Mention the unique features of nematodes.
Answer: The unique features of nematodes are: -

(i) Syncytial (no mesodermal lining).

(ii) Body wall musculature is made of special types of muscles.

(iii) Sexual dimorphism is quite clear.

(iv) Their body is triploblastic and bilaterally symmetrical.

(v) They are generally cylindrical in shape.

(vi) Their body has a false cavity (pseudocoelomate).

(vii) The alimentary canal is distinct, having the mouth and the anus.

Q5: Give the reason why a snail & an octopus are classified under the same phylum?

Answer: Snails and octopus are classified under the phylum Mollusca due to the following three common characteristics: -

(i) Presence of a mantle cavity for respiration and excretion etc.

(ii) Presence of radula for feeding.

(iii) Presence of foot and shell.

Q6:List three basic chordate characters.

Answer: The three basic characters of chordates are: -

(i) Notochord: - A dorsal solid notochord is present throughout life or within the larval stage.

(ii) Nerve cord: - A hollow nerve cord is present dorsally.

(iii) Pharyngeal gill slits: - A perforated pharynx is present in young conditions or throughout life.

Q7: Give any four characteristics of hemichordate.

Answer: The four characteristics of hemichordate are: -

(i) These are worm-like marine animals that have an organ-system level of organization.

(ii) Their body is bilaterally symmetrical, triploblastic and coelomate (having true coelom).

(iii) The body is cylindrical and is divided into anterior proboscis, collar and a long trunk.

(iv) Respiration occurs through gills.

Q8: Give the reason why Arthropoda constitute the largest group of the animal kingdom.
Answer:Arthropoda constitutes the largest group of the animal kingdom: -

(i) Have an organ level of organization.

(ii) Bilaterally symmetrical, segmented, triploblastic, coelomate animals.

(iii) Body enclosed by the chitinous cuticle.

(iv) They have jointed appendages.

(v) Trachea or book gills for respiration.

Q9: List three adaptations that help the birds (Aves) in flying.
Answer:The three adaptations that help the birds (Aves) in flying are: -

(i) Lightweight smooth feathers.

(ii) Flight muscles contain white fibres which are poorer in mitochondria and lack myoglobin.

(iii) The long bones are hollow (Pneumatic bones) and filled with air.

7 Mark Questions

Q1: Mention the important characteristics of coelenterate and give examples.
Answer: The important characteristics of coelenterates are: -

(i) They are marine animals that may be solitary or colonial.

(ii) The body consists of two germ layers, the ectoderm and endoderm (diploblastic).

(iii) Their body is radially symmetrical.

(iv) They are acoelomate animals i.e., lack true coelom. They exhibit a blind sac body plan.

(v) They have a holozoic form of nutrition.

(vi) The body encloses a large central cavity known as coelenteron, which has a single opening to the outside. Coelenterons is also known as a gastrovascular cavity.

(vii) They have either intracellular or extracellular modes of digestion.

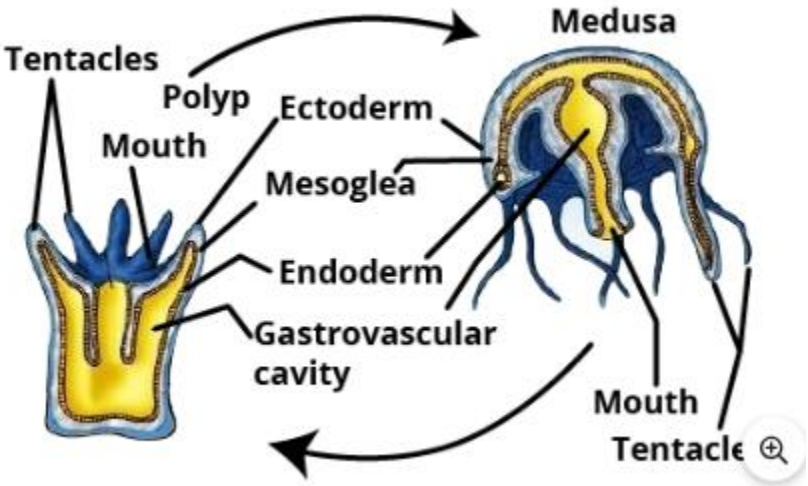
(viii) They commonly show polymorphism. There are two types of individuals: a polyp (asexual form) and a medusa (sexual form).

(ix) They have tentacles, which are usually thread-like outgrowths.

(x) Stinging cells or nematocysts are present.

(xi) Their larvae are ciliated and free-swimming.

(xii) Example: - Obelia, Aurelia, Hydra, Metridium etc.



Q2: Mention the important characters of the phylum Echinodermata and give examples.

Answer:

The important characters of phylum Echinodermata are: -

(i) The term Echinodermate means "spiny skin," and it refers to a group of animals represented by common forms such as starfish and sea urchins.

(ii) The skin forms a hard, spiny protective skeletal covering.

(iii) They are sluggish marine forms.

(iv) They usually show pentamerous radial symmetry.

(v) The radial symmetry is superficial and the body in fact can be divided only into two halves.

(vi) They have a coelom as well as a water vascular system.

(vii) Locomotion takes place through the use of numerous hollow tube feet.

(viii) Excretion occurs by means of diffusion through the body.

(ix) Fertilization occurs in the open sea.

(x) The development includes free swimming diploneural larva.

(xi) Example: - Asterias, Sea Urchin and Sea cucumber.

Q3: Enlist the main features of Aschelminthes and give examples.

Answer:

The main features of Aschelminthes are: -

(i) They are called roundworms as they appear circular in C.S.

(ii) Free-living, aquatic, terrestrial or parasitic.

(iii) The organization of the body is organ level.

(iv) Bilaterally symmetrical animals.

(v) They are triploblastic and pseudocoelomate.

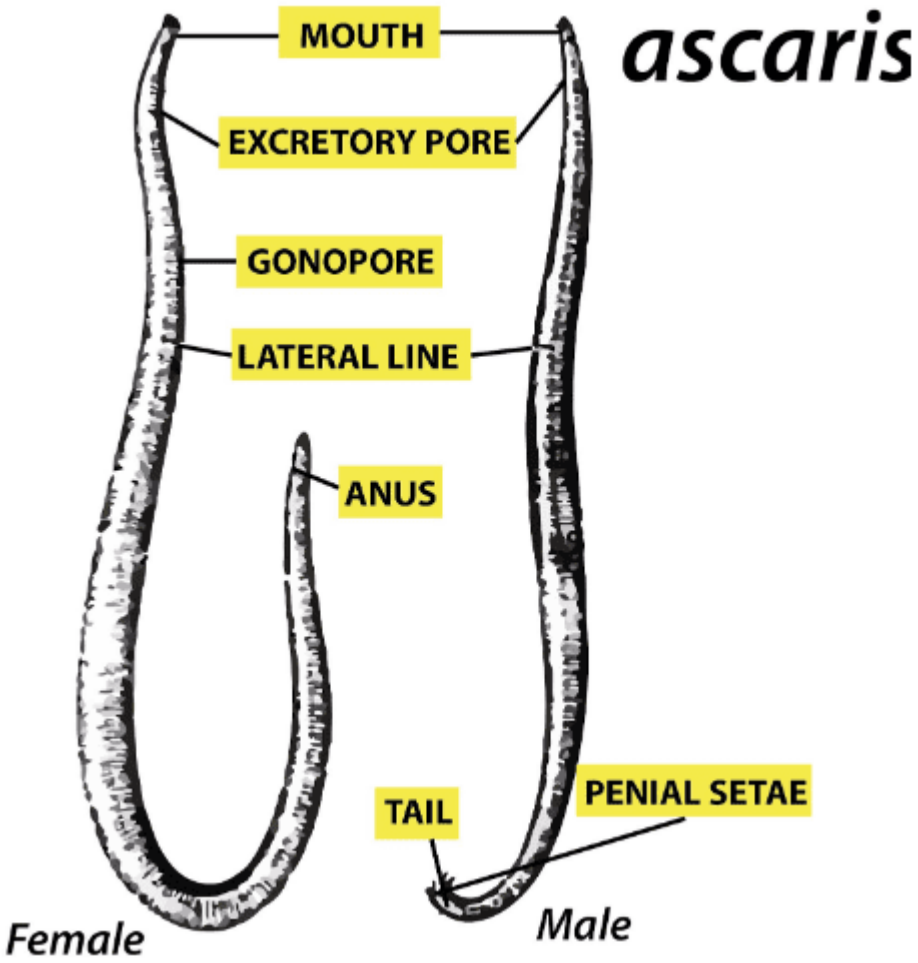
(vi) Alimentation is complete with the muscular or pharynx.

(vii) Sexes are Separate.

(viii) The body is covered by a cuticle.

(ix) Fertilization is internal.

(x) Example: - Filarial worm (Wuchereria), Ascaris, Pinworm (Enterobius) and Hookworm (Ancylostoma).



Q4:What are the peculiar features that you find in parasitic platyhelminthes?

Answer:

The typical features of the parasitic platyhelminthes are:

(i) Free-living parasitic forms.

(ii) They have an organ level of organization.

(iii) Mostly hermaphrodites

(iv) Three-layered body wall – the epidermis (outer covering) is often ciliate and covered with cuticle.

(v) The digestive tract is incomplete or absent

(vi) The presence of well-defined excretory structures, such as flame cells.

(vii) Presence of anti-toxins and a thick tegument which is resistant to the digestive enzymes of the host.

(viii) Anaerobic respiration. No special respiratory structure was observed.

(ix) The front body part has suckers, hooks, eye spots and auricles to attach to the hosts.

(x) A highly developed reproductive system of parasitic forms.

Q5:What are the reasons that you can think of for the arthropods to constitute the largest group of the animal kingdom?

Answer:

The following are the causes for the arthropods making up the largest group of animal kingdoms:

(i) They have jointed legs that allow them to be motile, and perform many other functions due to these jointed appendages.

(ii) A hardened skeleton made of chitin protects their body.

(iii) Hard skeletons reduce water loss from the body.

(iv) Demonstrate a different system for locomotion, respiration and reproduction.

(v) Ability to live in diverse conditions and varied habitats.

(vi) In comparison to other phyla, they are pre-developed.

(vii) Well-developed sense organs and nervous system.

(vii) Some insects exhibit pheromones that enable communication.

Multiple Choice Questions

1. Which class has the largest number of animals?

a. Fishes
b. Reptiles
c. Insects
d. Mammals

Answer: Insects

2. Identify the characteristic of acoelomates

a. Absence of mesoderm
b. Absence of brain
c. Coelom that is incompletely lined with a mesoderm
d. Solid body without a cavity surrounding internal organs

Answer: Solid body without a cavity surrounding internal organs

3. Salamander belongs to the class

a. Pisces
b. Aves
c. Reptiles
d. Amphibian

Answer: Amphibian

4. Which of the following combinations is incorrect?

a. Nematoda- roundworms, pseudocoelomate
b. Calcarea- gastrovascular cavity, coelom present
c. Echinodermata- coelom present, bilateral symmetry
d. Platyhelminthes- gastrovascular cavity, flatworms, acoelomate

Answer: Calcarea- gastrovascular cavity, coelom present

5. Flame cells are the excretory structures for

a. Annelida
b. Coelenterates
c. Platyhelminthes
d. Echinodermata

Answer: Platyhelminthes

6. Phylum Porifera is classified based on

a. Branching
b. Symmetry
c. Spicules
d. Reproduction

Answer: Spicules

7. The canal system in sponges develops due to

a. Porous walls
b. Gastrovascular system
c. Reproduction
d. Folding of inner walls

Answer: Folding of inner walls

8. Select the correct pair

a. Arthropoda- silver fish
b. Pisces- jelly fish

c. Echinodermata- cuttle fish
d. Mollusca- star fish

Answer: Arthropoda- silver fish

9. Which group does not contain polyp?

a. Anthozoa
b. Hydrozoa
c. Scyphozoa
d. Calcarea

Answer: Calcarea

10. Ascaris is characterized by

a. Presence of true coelom and metamerism
b. Presence of true coelom but the absence of metamerism
c. Absence of true coelom and metamerism
d. Absence of true coelom but the presence of metamerism

Answer: Absence of true coelom and metamerism

Macthing

Match the folliowing

Column1	Column2
(a)operculum	(a)ctenophora
(b)parapodia	(b)Mollusca
(c)scales	(c)Porifera
(d)comb plates	(d)Reptilla
(e)Radula	(e)Annelida
(f)Hairs	(f)cyclostomata andchondrichthyes
(g)choanocytes	(g)Mammaliya
(h)Gill slits	(h)Osteichthyes

Answer:

Column1	Column2
(a)operculum	(h)Osteichthyes
(b)parapodia	(e)Annelida
(c)scales	(d)Reptilla
(d)comb plates	(a)ctenophora
(e)Radula	(b)Mollusca
(f)Hairs	(g)Mammaliya
(g)choanocytes	(c)Porifera

(h)Gill slits	(f)cyclostomata andchondrichthyes

DIAGRAMS

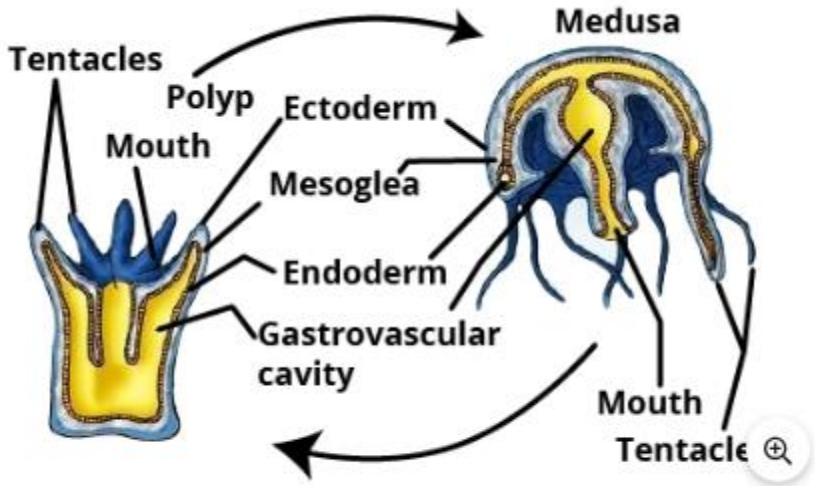


Figure: Alteration of generation in coelenterates

SUMMARY

The basic fundamental features such as level of organisation, symmetry, cell organisation, coelom, segmentation, notochord, etc., have enabled us to broadly classify the animal kingdom. Besides the fundamental features, there are many other distinctive characters which are specific for each phyla or class. Porifera includes multicellular animals which exhibit cellular level of organisation and have characteristic flagellated choanocytes. The coelenterates have tentacles and bear cnidoblasts. They are mostly aquatic, sessile or free-floating. The ctenophores are marine animals with comb plates. The platyhelminths have flat body and exhibit bilateral symmetry. The parasitic forms show distinct suckers and hooks. Aschelminthes are pseudocoelomates and include parasitic as well as non-parasitic roundworms. Annelids are metamerically segmented animals with a true coelom. The arthropods are the most abundant group of animals characterised by the presence of jointed appendages. The molluscs have a soft body surrounded by an

external calcareous shell. The body is covered with external skeleton made of chitin. The echinoderms possess a spiny skin. Their most distinctive feature is the presence of water vascular system. The hemichordates are a small group of worm-like marine animals. They have a cylindrical body with proboscis, collar and trunk. Phylum Chordata includes animals which possess a notochord either throughout or during early embryonic life. Other common features observed in the chordates are the dorsal, hollow nerve cord and paired pharyngeal gill slits. Some of the vertebrates do not possess jaws (Agnatha) whereas most of them possess jaws (Gnathostomata). Agnatha is represented by the class, Cyclostomata. They are the most primitive chordates and are ectoparasites on fishes. Gnathostomata has two super classes, Pisces and Tetrapoda. Classes Chondrichthyes and Osteichthyes bear fins for locomotion and are grouped under Pisces. The Chondrichthyes are fishes with cartilaginous endoskeleton and are marine. Classes, Amphibia, Reptilia, Aves and Mammalia have two pairs of limbs and are thus grouped under Tetrapoda. The amphibians have adapted to live both on land and water. Reptiles are characterised by the presence of dry and cornified skin. Limbs are absent in snakes. Fishes, amphibians and reptiles are poikilothermous (cold-blooded). Aves are warm-blooded animals with feathers on their bodies and forelimbs modified into wings for flying. Hind limbs are adapted for walking, swimming, perching or clasping. The unique features of mammals are the presence of mammary glands and hairs on the skin. They commonly exhibit viviparity.