# 8 Kingdom Animalia

## 8.0 : Introduction :

**Q.1. What are the common characteristics of Kingdom Animalia?**

**Ans:** Animals show the following characteristics:

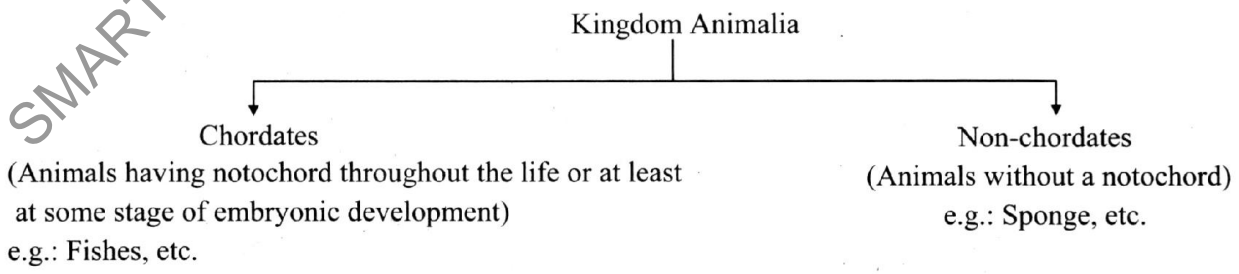
i. The animals are multicellular eukaryotes.
ii. Animal cell lacks a cell wall.
iii. They show heterotrophic mode of nutrition.
iv. Most of them are capable of locomotion or body movements, however some are sedentary (eg – sponges).
v. They possess nervous system and most of the animals have specialized sense organs for co-ordination of different systems.
vi. Reproduction is mainly sexual by the formation of gametes.

**Q.2. How many animal phyla have been recognized so far?**

**Ans:** At present, 30 animal phyla (of which ten are major and twenty are minor) have been recognized.

**Q.3. How can animals be broadly classified?**

**Ans:** Animals are broadly classified on the basis of the presence or absence of notochord, as:




**Q.4. Define the following:**

**i. Notochord**
**ii. Non-chordates**
**iii. Chordates**

**Ans: i. Notochord:** Notochord (Gr. Noton = back and chorda = chord) is a stiff, rod-like structure, made up of tightly packed vacuolated cells which runs along the mid dorsal line along the back.

**ii. Non-chordates:** Animals which do not possess a notochord are called non-chordates.

**iii. Chordates:** Animals showing presence of notochord at least at some stage of embryonic development or throughout the life, are known as chordates.

**Q.5. What is the basic difference between non-chordates and invertebrates?**

**Ans:** Non-chordates (e.g. Sponge) are the animals without a notochord, whereas invertebrates (e.g. Frog) are the animals without a vertebral column.

**Q.6. State the important characteristics of non-chordates.**

**Ans:** The important characteristics of non-chordates are:

i. Notochord is absent.
ii. Nerv~ cord is double, ventral, solid and ganglionated.
iii. The heart, if present is dorsal.
iv. Pharynx is not perforated by gill-slits.
v. Skeleton if present, is exoskeleton.

## 8.1 : Criticia for animal elassification :

**Q.7. Explain the term germinal layer.**

**Ans:** Every multicellular organism begins' life from a single cell called zygote. Zygote divides and redivides to form mass of cells. This mass of cells gets arranged in two or three layers called "germinal layers".

**Q.8. How are animals classified on the basis of germ layers?**

**Ans:** i. When an organism shows only two germ layers, they are called diploblastic animals. In this case, the outer ectoderm is separated from the inner endoderm by a non-living substance called mesoglea. Members of phylum Cnidaria are diploblastic animals.

ii. When an organism shows three germinal layers, they are called triploblastic animals. The three layers are namely, outer ectoderm, middle mesoderm and inner endoderm. Members of Phylum Platyhelminthes onwards are triploblastic.

**Q.9. State various types of animal body plan with one example each.**

**Ans:** Animals show three fundamental body plans as follows:

i. Cell aggregate body plan. e.g. Sponge.

ii. Blind sac body plan. e.g. Hydra

iii. Tube within tube body plan. e.g. .Earthworm.

**Q.10. Explain cell aggregate body plan in animals.**

**Ans:** i. Cell aggregate body plan is exhibited by simplest type of animals.

ii. The animals show aggregation of cells with least division of labour.

iii. The cells do not show tissue or organ formation.

iv. These cells lack nervous co-ordination.

v. Members of Phylum Porifera (like sponges) show cell aggregate body plan.

Cell aggregate plan

**Q.11. Write a note on blind sac body plan.**

**Ans:** i. The blind sac body plan is exhibited by little complex animals.

ii. A digestive cavity with a single opening which acts as a mouth as well as anus is present. Thus, the digestive system is incomplete in these organisms.

iii. The food is ingested and egested through the same opening (mouth).

iv. Members of phylum Cnidaria and Platyhelminthes show a blind Blind sac body plan sac body plan.

Blind sac body plan

**Q.12. Explain tube within tube body plan.**

**Ans:** Tube within tube body plan is present in all the advanced and highly evolved organisms.

i. Digestive system is complete with two separate openings, i.e. mouth at one end and anus at the other.

ii. Animals belonging to Phylum Annelida onwards show tube within Tube within tube body plan tube body plan.

Tube within tube body plan

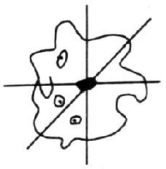
**Q.13. Give an account of the different types of symmetry in animals.**

**OR**

**Describe with examples, various types of body symmetry shown by animals.**

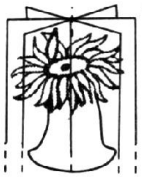
**Ans:** Body symmetry implies to the similarity in shape, size and number of parts on the opposite sides of a median line when body is divided into two halves by an imaginary line along different planes. Animals may be asymmetrical, radially symmetrical or bilaterally symmetrical.

**i. Asymmetrical animals:**
An animal is said to be asymmetrical when its body cannot be divided into two identical halves in any plane.
e.g. Amoeba, snails, certain sponges, etc.

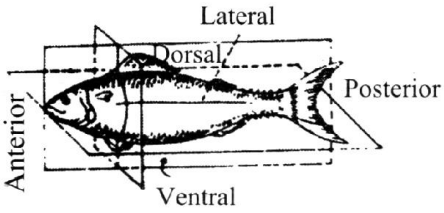


**Asymmetric**

**ii. Radially symmetrical animals:**
In certain animals, body can be cut or divided into two similar halves in a number of planes wherein, all the cuts (planes) pass through the centre.
This type of symmetry is called radial symmetry.
e.g: Starfish, Hydra.


**Radial symmetry**

**iii. Bilaterally symmetrical animals:**
In this type, the body of the animal can be bisected or divided in two equal or identical halves by a single median or vertical plane.
e.g. Frog, Fish.

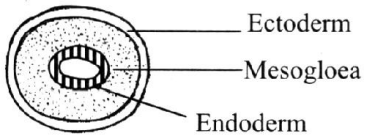


**Bilateral symmetry**

**Q.14. What is coelom?**
**Ans:** In triploblastic animals, a space is created between the body wall and the alimentary canal due to splitting of mesoderm, during embryonic development. This space or body cavity is called as coelom.

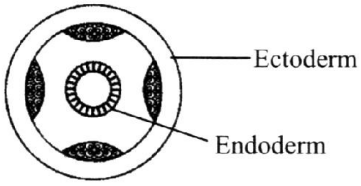
**Q.15. Classify the animals on the basis of type of coelom.**
**Ans: Based on the nature of coelom, there are three types of animals:**

**i. Acoelomates:**
In certain animals, there is no' body cavity or coelom. Such animals are called acoelomates. The space between the body wall and the alimentary canal is filled with parenchymatous tissue.
e.g. Members of phylum Platyhelminthes.



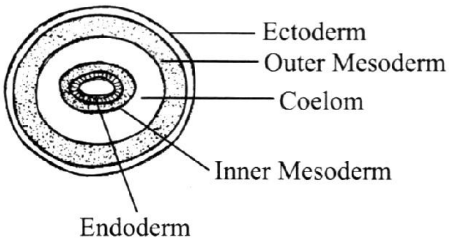
**Acoelomate**

**ii. Pseudocoelomates:**
They show a false body cavity (pseudocoel), i.e. the cavity between the body wall and alimentary canal is lined by patches of mesodermal cells.
e.g. Members of phylum Aschelminthes.



**Pseudocoelomate**

**iii. Coelomates:**
All animals from phylum Annelida onwards, have true body cavity or coelom.
The mesoderm splits into two layers to enclose a cavity called coelom.
The outer layer lines the body wall, while the inner layer covers the alimentary canal. Endoderm
The cavity is filled with coelomic fluid. Coelomate In some animals like cockroach, body cavity is fined with blood, hence it is called haemocoel.



**Coelomate**

**Q.16. Define the term "acoelomate organism".**
**Ans:** Animals which do not have body cavity or coelom, are called as acoelomate organisms.

**Q.17. Define the term "pseudocoelomate".**
**Ans:** In some animals, the cavity between body wall and alimentary canal is lined by patches of mesodermal cells. This is a false body cavity and such organisms are called as pseudocoelomates.

**Q.18. State the significance of coelom.**

**Ans: Significance of coelom:**

i. It is the true fluid filled body cavity lined completely by mesoderm.
ii. Coelom contains all visceral organs.
iii. It acts as a shock absorber and protects the visceral organs from mechanical shocks.
iv. It gives a better flexibility and better compartmentalization to the body.

**Q.19. How useful is the study of nature of body cavity and coelom in classification of animals?**

**Ans:** Study of nature of body cavity (coelom) indicates whether the animal is acoelomate or pseudocoelomate (with false coelom) or coelomate. This will help in assigning exact taxonomic position of animal.

**Q.20. What is meant by the term "metamerism"?**

**Ans:** In some animals, body consists of many segments arranged along the length of the body. When the external segmentation coincides with the internal segmentation, it is called as metameric segmentation and the phenomenon is called metamerism.

**Q.21. Give a brief account of skeleton or body support in animals.**

**Ans: Skeleton:**

i. The external or internal framework which provides support to the body is called skeleton.
ii. It is of two types: exoskeleton and endoskeleton.
iii. The lower group of animals possesses only exoskeleton for protection. e.g. Cockroach.
iv. Higher animals possess both the exoskeleton as well as endoskeleton. e.g. Fish, Cobra, Parrot.

## 8.2 : Salient features of non-chordates upto phylum level :

**Q.22. Make a list of invertebrate phyla. Give one example of each.**

**Ans:**

| No. | Phylum | Example |
|---|---|---|
| i. | Porifera | *Sycon* |
| ii. | Cnidaria | *Hydra* |
| iii. | Ctenophora | *Pleurobrachia* |
| iv. | Platyhelminthes | Tapeworm |
| v. | Aschelminthes | *Ascaris* |
| vi. | Annelida | Earthworm |
| vii. | Arthropoda | Cockroach |
| viii. | Mollusca | *Pila* |
| ix. | Echinodermata | Starfish |
| x. | Hemichordata | *Balanoglossus* |

**Q.23. Give the characteristic features of Phylum Porifera.**

**Ans: Phylum Porifera: (Pori = Pores, Pherein = bearing).**

Animals like Sycon and Spongilla belong to the phylum, Porifera.

These are the simplest pore bearing organisms called sponges.

**Characteristics:**

i. **Forms:** Poriferans may be either solitary (living alone) or colonial (live in colonies). They are sedentary (attached to a substratum or rock) forms. Ostia
ii. **Habitat:** They are mostly marine, but few species are found in fresh water. Cylinders
iii. **Body shape:** The body is vase-shaped or cylindrical and asymmetric.
iv. **Body plan:** They show cellular grade. of organization without formation of tissues and organ.
v. **Body surface:** The body surface is perforated with minute pores called ostia (through which water

enters). A large opening called Stolon osculum (through which water comes out) is present at the free end.

vi. **Coelom:** A central space called spongocoel is present in the body. Sycon Substratum

vii. **Digestive system:** The sponges have unique type of flagellated cells called choanocytes or collar cells for digestion. However, specialized digest~ve system is absent; 'choanocytes and amoeboid cells help in intra-cellular digestion.

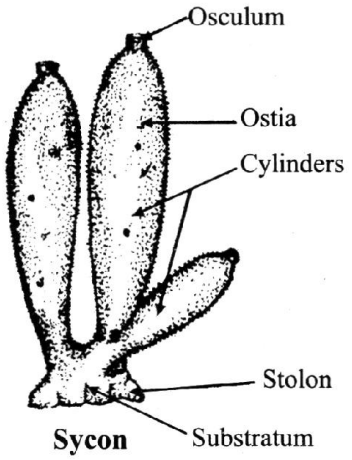
viii. **Endoskeleton:** The endoskeleton of sponges consists of spicules of calcium carbonate or silica or proteinous spongin fibres.

ix. **Food:** Sponges feed on detritus material present in water.

x. **Reproduction:**Asexual reproduction takes place by budding and gemmule formation

Sexual reproduction is by formation of gametes.

Sponges have great power of regeneration. ,



Sycon

**Q.24. Name the pores present on the surface of body of Porifera.**

**OR**

**What are ostia?**

**Ans:** Minute pores present on the body surface of the poriferans are called as ostia (singular ostium).

**Q.25. What are choanocytes? Give their function.**

**Ans:** Choanocytes are the flagellated collar cells present in sponges.

These are the specialized cells which carry out intracellular digestion.

**Q.26. Name a fresh water sponge.**

**Ans:** Spongilla is a fresh water sponge species.

**Q.27. Give the salient features of Phylum Coelenterata (Cnidaria).**

**Ans:** Salient features of Phylum Coelenterata (Gr. Koilos = cavity, enteron == gut or intestine):

Animals like Hydra, Jelly fish and Sea anaemone belong to phylum Cnidaria (formerly called Coeler;terata).

**Salient features:**

i. **Form:** Cnidarians are either colonial or solitary forms.

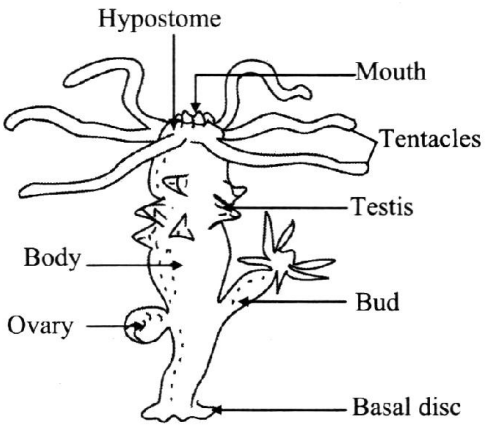
ii. **Habitat:** These are sedentary or free living, most of them are marine but few are fresh water forms.

iii. **Body symmetry:** The body is radially symmetrical and the animal acoelomate.

iv. **Organization:** These animals are the first one to show tissue level of organization.

v. **Cnidocytes:** Presence of specialized cells called' cnidocytes, which contain (the stinging structure) nematocysts is the main feature of coelenterates due to which members of this phylum are called Cnidarians.

Cnidocytes in tentacular region help in capturing large prey with the help of toxin discharged from the nematocysts. Hence, these are offensive as well as defensive.



Hydra

vi. **Body plan:** They have blind sac body plan with a single opening (mouth). Anus is absent

vii. **Body cavity:** Cnidarians have a central cavity called coelenteron or gastrovascular cavity, which helps in digestion and circulation.

viii. **Body form:** These show two types of body forms namely, polyp and medusa. Polyps are sedentary, tubular, cylindrical forms (eg. hydra), whereas medusa is free swimming, umbrella shaped.

ix. **Tentacles:** Mouth is surrounded by hollow contractile finger-like processes called tentacles. They

help in locomotion and capturing the prey.

x. **Nervous system:** Nervous system is poorly developed forming nerve net throughout the body.

xi. **Reproduction:** Asexual reproduction occurs by lateral budding and sexual reproduction takes place by gamete formation.

**Q.28. Name the special cells serving as organs of offence and defence in Cnidaria.**

**Ans:** Cnidocytes are the special cells which contain a stinging structure called nematocyst serving as organ of offence and defence in Cnidaria.

**Q.29. Write in short about the importance of corals.**

**Ans:** Corals are polyp type of coelenterates.

Corals form coral reefs made of calcium and hence are used as calcium supplements.

Corals are also used as decorative articles. Red corals are used as precious jewellery.

Coral reefs protect the sea-shores from tidal effects.

**Q.30. Name the coelenterate which is used as precious jewellery.**

**Ans:** Red corals are used as precious jewellery.

**Q.31. Describe the salient features of Phylum Ctenophora.**

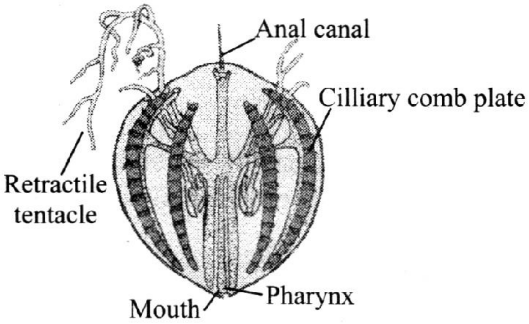
**Ans:** Phylum Ctenophora includes species like Pleurobrachia.

i. **Habitat:** They are exclusively marine in habitat.

ii. **Symmetry:** They are radially symmetrical.

iii. **Bioluminescence:** They show bioluminescence (emits light from the body)

iv. **Reproduction:** Sexual reproduction and external fertilization.



*Pleurobrachia*

**Q.32. Mention the unique features of Phylum Platyhelminthes.**

**OR**

**Describe distinctive features of phylum Platyhelminthes,**

**Ans:** Members of Phylum Platyhelminthes are commonly called as flatworms, and includes animals like Taenia (tapeworm), Fasciola (Liverfluke) and Planaria. Scolex

**Distinctive features of Phylum Platyhelminthes: Immature Neck**

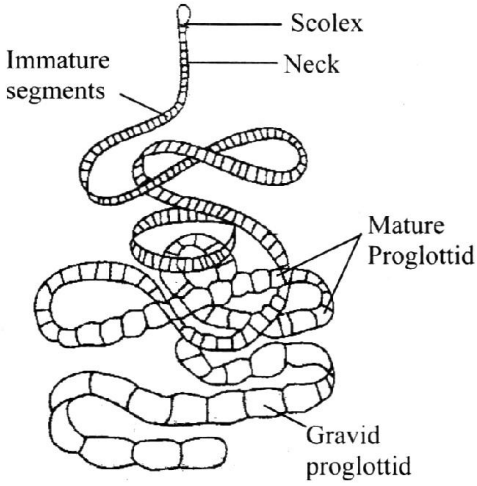
i. **Body symmetry:** Body is bilaterally symmetrical. segments

ii. **Body plan:** The animals of this phylum show blind sac body plan.

iii. **Nutrition:** Although most of these organisms are endoparasites, few of them are free living.
Parasitic forms shows presence of suckers or hooks for attachment.

iv. **Body shape:** Body of the animal is dorsiventrally flattened, unsegmented and leaf like or ribbon like. It is covered by cuticle.

v. **Digestive system:** Parasitic forms generally lack digestive system.
If present, it is incomplete, with only one opening called mouth. There is no digestive tract in tapeworms, nutrients are absorbed directly through skin or through oral opening.



**Tapeworm** ***(Taenia solium)***

vi. **Excretion:** Excretory system is made up of flame cells or protonephridia.

vii. **Nervous system:** Nervous system consists of a nerve ring and nerve cords.

viii. **Reproduction:** They are mostly hermaphrodite (i.e. both sex organs are present in the same body). These animals show high power of regeneration.

ix. **Locomotion:** Locomotory structures and sense organs are absent.

**Q.33. What are the peculiar features, that one finds in parasitic Platyhelminthes?**

**OR**

**Explain the various adaptations seen in flatworms for parasitic mode of life.**

**Ans:** Most of the flatworms are parasites. In order to live a parasitic life, they have to adapt or modify themselves. These adaptations are called parasitic adaptations.

Some of the structural/morphological adaptations for parasitic mode of life are:

i. Body is dorso-ventrally flattened (it occupies less space in the body of host).

ii. Presence of suckers or hooks for attachment.

iii. Epidermis is replaced by tough cuticle to resist host enzymes.

iv. Locomotory organs are absent.

v. Sense organs are absent (parasites live in protected environment).

vi. Nervous system is also poorly developed.

vii. The digestive system is absent or simplified as a parasite gets pre-digested food.

viii. The animals are bisexual/hermaphrodites with well developed reproductive system. Very large number of eggs are produced to ensure survival.

ix. Life cycle is complicated and requires two hosts.

x. Eggs are embryonated and are covered with protective cuticle.

**Q.34. Name the excretory organ in Platyhelminthes.**

**Ans:** Flame cells or protonephridia are the excretory organs in Platyhelminthes.

**Q.35. Describe the salient features of Phylum Aschelminthes.**

**Ans:** Phylum Aschelminthes is also called as Nemathelminthes (Nema = thread, helm ins = worms):

These are commonly referred as round worms. Ascaris, Wuchereria and Dracunculus belong to this phylum.

**Salient features:**

i. **Habitat:** These are mostly parasitic, living in the body fluids of the host. However, few forms are free living.

ii. **Body shape:** The body is long, cylindrical, thread like.

iii. **Body symmetry:** These are bilaterally symmetrical, pseudocoelomate animals.

iv. **Body plan:** These show tube within a tube type of body plan.

v. **Body covering:** The body is covered by tough, resistant cuticle.

vi. **Muscles:** Body wall has longitudinal muscles, but circular muscles are absent.

vii. **Digestive system:** Digestive system is complete with mouth and anus, at opposite ends.

viii. **Excretion:** Excretion takes place either by canals or protonephridia.

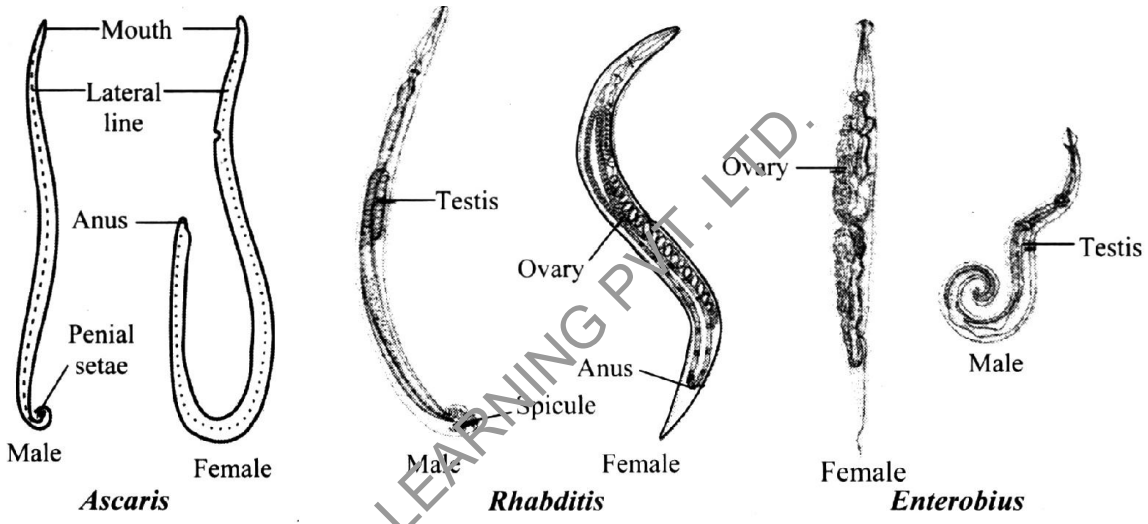
ix. **Nervous system:** Nervous system consists of a nerve ring and nerves.

x. **Sexual dimorphism:** Sexes are separate, i.e. animals are unisexual.

Animals like Ascaris show sexual dimorphism.

The male Ascaris is shorter and narrower than the female and has a curved posterior end with a pair of penial setae for copulation.

The female Ascaris is relatively longer and broader and has a straight posterior end without penial setae.




**Q.36. Distinguish between male Ascaris and female Ascaris.**
**Ans:**

| No. | Male *Ascaris* | Female *Ascaris* |
|---|---|---|
| i. | The male *Ascaris* is shorter and narrower than the female. | The female *Ascaris* is longer and broader than male. |
| ii. | The male has a curved posterior end. | The female has a straight posterior end. |
| iii. | The male *Ascaris* shows presence of a pair of penial setae for copulation. | The female *Ascaris* does not have penial setae. |

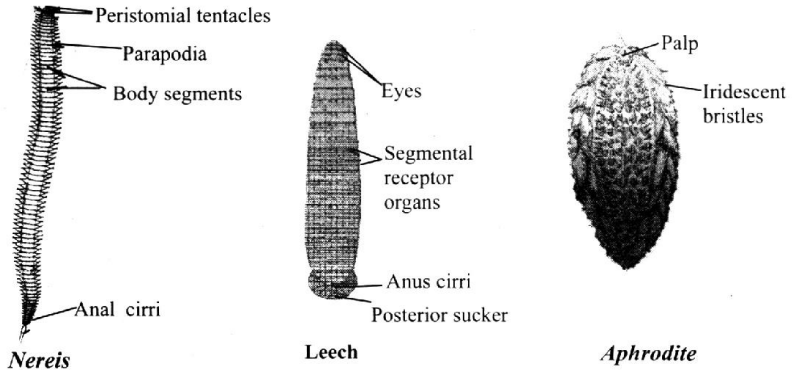


**Q.37. Give distinguishing features of Phylum Annelida.**
**Ans:** Phylum Annelida (Annulus = ring, eidos = form).

Members of Phylum Annelida are commonly known as ring worms and include organisms like Nereis, Pheretima (Earthworm), Hirudinaria (Leech).

**Salient features:**

i. **Habitat:** Annelids are free-living although few may be parasitic. The free-living forms are aquatic. Some are burrowing and occur in moist soils.
ii. **Body symmetry:** They are bilaterally symmetrical and true coelomates.
iii. **Segmentation:** Body is soft, elongated, cylindrical and metamerically segmented.
iv. **Digestive system:** Digestive system is complete with a straight, tubular alimentary canal having mouth and anus at opposite ends.
v. **Locomotion:** Locomotion takes place with the help of setae, parapodia or suckers. Well developed longitudinal and circular muscles help in locomotion.



vi. **Respiration:** Respiration takes place through body surface.
vii. **Circulation:** Circulatory system is of closed type. (i.e. the blood moves through vessels)
viii. **Respiratory pigment:** Oxygen is carried by the respiratory pigment haemoglobin dissolved in the plasma of blood.
ix. **Excretion:** Removal of waste takes place through nephridia.
x. **Nervous system:** Nervous system is formed by nerve ring and ganglionated nerve cord.
xi. **Reproduction:** These are generally bisexual (hermaphrodite) animals, but few may be unisexual (Nereis).
xii. **Importance:** The ectoparasites like leeches suck vertebrate blood. Such animals are called Sanguivorous. These are used for medicinal purposes to remove rotten blood and during surgical operations.
The saliva of leeches contains an anticoagulant known as hirudin (a substance which prevents blood from clotting is called as anticoagulant).

**Q.38. Name a sanguivorous annelid.**
**Ans:** Leech is a sanguivorous (which sucks vertebrate blood) annelid.

**Q.39. Which anticoagulant is present in salivary glands of leech?**
**Ans:** Hirudin is the anticoagulant present in salivary glands of leech.

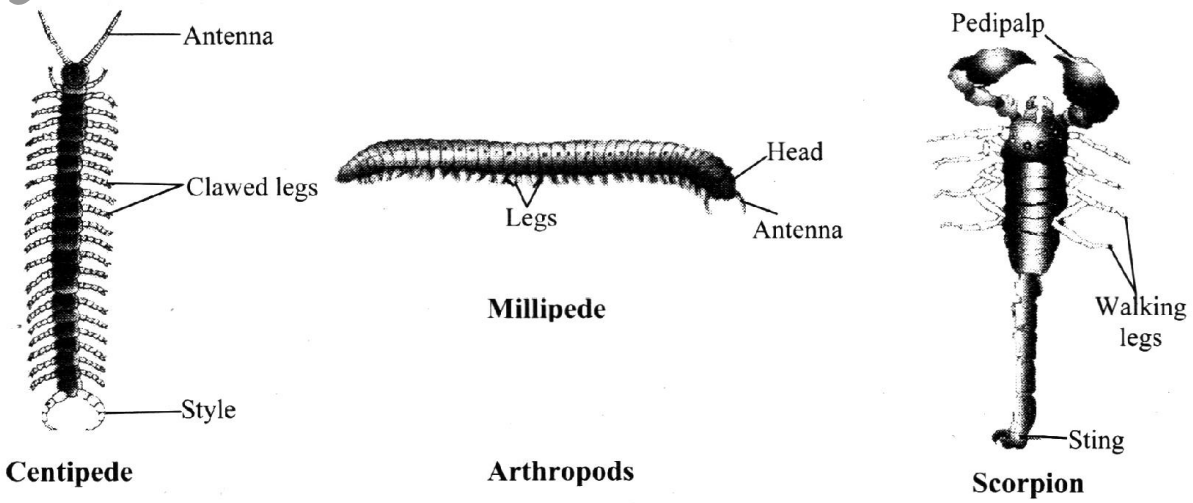
**Q.40. Name the excretory organ of annelid.**
**Ans:** Nephridia is the excretory organ of annelid.

**Q.41. Give an account of Phylum Arthropoda.**

**OR**

**Describe salient features of Phylum Arthropoda.**

**Ans: Salient features of Phylum Arthropoda (arthros = jointed, pod a = leg)**
Animals like cockroach, butterfly, scorpion, centipede belong to this phylum.




**Salient Features:**
i. **Habitat:** Arthropods are solitary or colonial, most of them are free-living. Barnacles are sedentary . Arthropods are omnipresent (present everywhere).
ii. **Body symmetry:** Body is bilaterally symmetrical.
iii. **Exoskeleton:** Body is covered by a tough, chitinous cuticle which forms the exoskeleton. As exoskeleton does not allow body growth, arthropods shed off their exoskeleton periodically during growth. This process is called moulting or ecdysis.
iv. **Body division:** Body is divided into head, thorax and abdomen. In some forms, head and thorax fuse to form cephalothorax, e.g. Prawns.

v. **Segmentation:** Body shows metameric segmentation.
vi. **Food:** These animals feed on detritus food, flesh, etc. The parasitic arthropods are sanguivorous (blood sucking).
vii. **Locomotion:** Legs in arthropods are adapted for crawling, creeping or walking, wings for flying.
viii. **Digestion:** Digestive system is complete and divided into foregut, midgut and hindgut. Mouth-parts are highly evolved and are used for biting, sucking and chewing.
ix. **Circulation:** Circulatory system is of open type wherein, blood flows in open sinuses and covers the organs. Blood cells are present. The internal cavity is called haemocoel.
x. **Respiration:** Respiration occurs through respiratory organs like gills, trachea, book lungs or book gills.
xi. **Excretion:** Excretion takes place by green glands or by Malpighian tubules.
xii. **Nervous system:** Nervous system consists of nerve ring and ventral ganglionated nerve cord.
xiii. **Sense organs:** Arthropods have well developed sense organs in the form of antennae, compound eyes and taste receptors.
xiv. **Sexual reproduction:** Sexes are generally separate in arthropods with distinct sexual dimorphism. Animals are mostly oviparous (exception: Scorpion).
Fertilization is generally internal. Development is direct or indirect (by metamorphosis).
In some arthropods, like honey bees, bugs, etc., the offsprings are produced by parthenogenesis (without fertilization).
xv. Importance: Some arthropods are of economic importance. For example, Honey bees are important for their honey and wax and silk worms for production of silk.
Lobsters, prawns, crabs are edible.
Some arthorpods are harmful and act as vectors to spread vanous diseases. e.g., mosquitoes, centipedes, spider, cockroach, etc.

**Q.42. Name the protein present in the exoskeleton of arthropods.**
**Ans:** The exoskeleton of arthropods is made up of a polysaccharide called' chitin'.

**Q.43. Name excretory organ of arthropods.**
**Ans:** Green gland or malpighian tubules are the excretory organ in arthropods.

**Q.44. Which phylum shows jointed legs?**
**Ans:** Phylum Arthropoda shows jointed legs.

**Q.45. Which phylum shows moulting or ecdysis?**
**Ans:** Phylum Arthropoda shows moulting or ecdysis.

**Q.46. What is moulting or ecdysis?**
**Ans:** The exoskeleton of arthropods is made up of tough material namely chitin. This tough exoskeleton does not allow the growth of the organism, hence it sheds off the exoskeleton during growth. This periodic shedding off of the chitinous exoskeleton to allow growth is called as moulting or ecdysis.

**Q.47. Name an arthropod which gives birth to young ones.**
**Ans:** Scorpion is an arthropod which gives birth to young ones.

**Q.48. Define the term 'Parthenogenesis'.**
**Ans:** Reproduction of offsprings without fertilization is called as parthenogenesis.

**Q.49. Give important features of Phylum Mollusca with suitable example.**

**OR**

**Describe the salient features of Phylum Mollusca.**

**Ans:** Phylum - Mollusca (soft bodied animals) (Mollis = soft) includes soft-bodied animals such as Chiton, Dentalium, Pila, bivalve and Octopus.

**Salient Features:**

i. **Habitat:** Molluscs are either free-living or sedentary.
They are mostly marine. Some species are benthoic, i.e. they live at the bottom and some are pelagic, i.e. free floating. Some are found in marshy places.

ii. **Body plan:** These are soft bodied and show tube within a tube type of body plan,

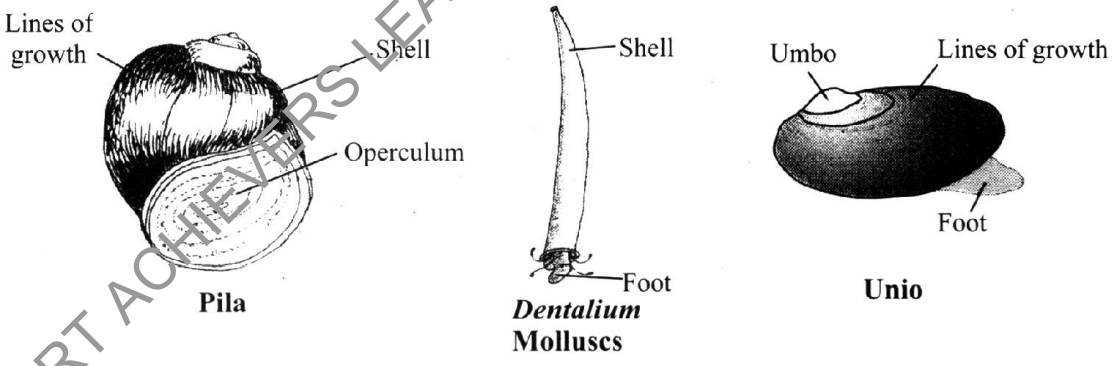
iii. **Body symmetry:** Most of the Molluscs show bilateral symmetry, Few become asymmetrical due to torsion (twisting),

iv. **Body division:** Body consists of head, foot and visceral mass,

v. **Exoskeleton:** Visceral mass is enclosed in thick muscular fold of body wall called mantle, Mantle secretes a hard calcareous shell, that may be external or internal or absent.

vi. **Food:** Molluscs feed on plants and animal matter.

vii. **Locomotion:** Locomotion occurs by arms or foot. Foot is modified for creeping, burrowing and swimming.




viii. **Digestive system:** Digestive system is well-developed and complete with anterior mouth and posterior anus.
In Gastropods, the intestine bends and takes a 'U' shaped curve due to torsion, As a result, mouth and anus lie close to each other, Buccal cavity. has a rasping organ called radula which is provided with transverse rows of teeth,

ix. **Respiration:** In aquatic forms, numerous gills called ctenidia help in exchange of gases, Terrestrial forms may show presence of lungs,

x. **Circulatory system:** Circulatory system is of open type (except in Sepia, where it is of the closed type), Blood contains a copper containing blue-co loured respiratory pigment called haemocyanin.

xi. **Excretion:** Excretion occurs by kidneys, also called 'Organ ofBojanus',

xii. **Nervous system and Sense organs:** Nervous system has three pairs of ganglia, namely cerebral ganglia in head, pedal ganglia in foot and visceral ganglia in visceral mass,
All these ganglia are interconnected by cornrnissures and connectives,
Sense organs such as eyes for vision, tentacles for tactile sensation and osphradia for testing purity of water are present.

xiii. **Sexual reproduction:** Sexes are usually separate, Animals are mostly oviparous and the development is direct or indirect.

**Q.50. Which phylum includes soft bodied animals?**
**Ans:** Phylum Mollusca includes soft bodied animals,

**Q.51. What is the role of radula in mollusca?**
**Ans:** Radula in molluscs, is the rasping organ which helps in feeding,

**Q.52. Name the excretory organ of Mollusca.**
**Ans:** Kidneys, also called "Organ of Bojanus" is the excretory organ of Mollusca,

**Q.53. Which respiratory pigment imparts blue colour to the blood of molluscs?**

**Ans:** Haemocyanin, a copper containing pigment imparts blue colour to the blood of molluscs.

**Q.54. Describe salient features of Phylum Echinodermata.**

**OR**

**Give an account of Phylum Echinodermata.**

**Ans: Echinodermata (Spiny skinned animals) (Echinos = spines, derma = skin)**

Spiny skinned animals like Sea lily, Brittle star, Sea star, Sea urchin, Sea cucumber are included in Phylum Echinodermata.

**Salient features:**

i. **Habitat:** These are exclusively marine, solitary or gregarious (living in colonies), sedentary or free living and benthoic.

ii. **Body symmetry:** These animals are radially symmetrical with pentamerous symmetry.

iii. **Shape:** Members of Echinodermata are spherical, elongated or star shaped. The body is without a well-defined head.

iv. **Exoskeleton:** Body is covered b.y a spiny exoskeleton made up of calcareous plates or ossicles.

v. **Water vascular system:** Presence of water vascular system is the peculiar character of echinoderms. Madreporite is the opening of water vascular system through which water enters. Water vascular system is useful in locomotion.

vi. **Food and feeding habits:** These are carnivorous animals mainly feeding on molluscs.

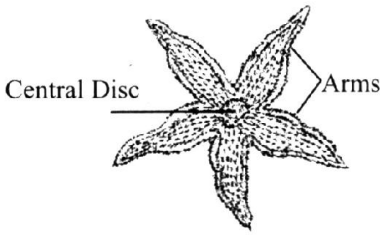
vii. **Locomotion:** Animals can locomote with arms and tube feet.

viii. **Respiration:** Peristomial gills, papillae, etc. are used for respiration.

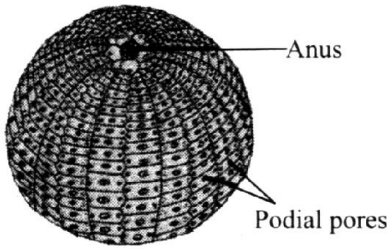
ix. **Circulation:** Circulatory system is reduced and is of open type. Heart is absent in circulatory system.

x. **Nervous system:** Nervous system is simple with a ring around the mouth and radial nerves in arms.

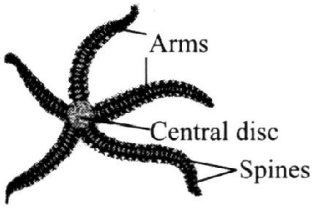
xi. **Reproduction and development:** Sexes are separate (sometimes bisexual). Fertilization is external. Development is indirect, i.e, through larval stages. They show high power of regeneration. ego Sea lily, Sea star, Sea cucumber



**Starfish**



**Sea urchin**



**Brittle Star**

**Q.55. Which phylum shows water vascular system?**

**Ans:** Phylum Echinodermata shows water vascular system.

**Q.56. Which system helps the Echinoderms in locomotion?**

**Ans.** Water vascular system helps the Echinoderms in locomotion.

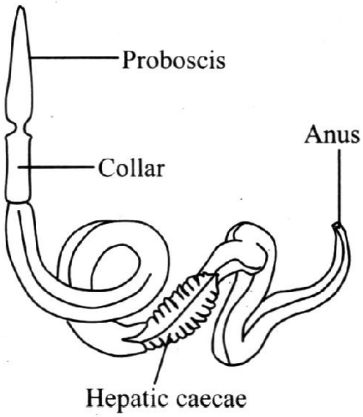
**Q.57. Explain in brief the salient features of Phylum Hemichordata. OR**

**Give the characters of Phylum Hemichordata.**

**Ans:** Hemichordates are known as acorn worms. Balanoglossus, Saccoglossus belong to the phylum Hernichordata.

**Salient features:**

i. **Habitat:** Hemichordates are exclusively marine animals, usually living at the bottom of sea in burrows. These are mostly free living but animals like Rhabdopleura are sedentary.



***Saccoglossus***

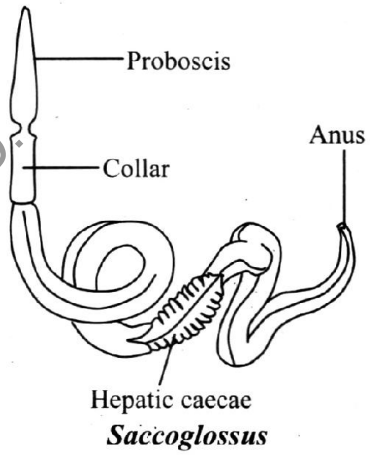
ii. Body shape and division: Body is soft, fragile and vermiform. It is unsegmented and divided into three parts namely proboscis, collar and trunk.

iii. **Food:** They feed on micro-organisms present in water through ciliary action.

iv. **Digestive system:** Alimentary canal is complete, straight or 'U' shaped. The intestine is long and bends with anus close to the mouth. Buccal cavity gives rise to a rod-like buccal diverticulum.

v. **Locomotion:** The proboscis helps in burrowing, while the entire body brings about movement.

vi. **Respiration:** Respiration is brought about by paired gills arranged in two longitudinal rows in the anterior trunk. Gills open by gill slits.



***Saccoglossus***

vii. **Circulation:** Circulatory system is simple and closed type. The blood is colourless.

viii. **Nervous system:** Nervous tissue is embedded in epidermis on the dorsal as well as the ventral side.

ix. **Reproduction and development:** Sexes are separate (sometimes bisexual). Fertilization is external and development is indirect through free swimming larva. Phylum Hemichordata is the connecting link between non-chordates and chordates.

## 8.3 : Salient features of chordates :

**Q.58. What are chordates? Give their diagnostic features.**

**Ans:** The animals that show the presence of notochord at some stage of embryonic development or throughout the life are known as chordates.

**Important characteristics of Phylum Chordata:**

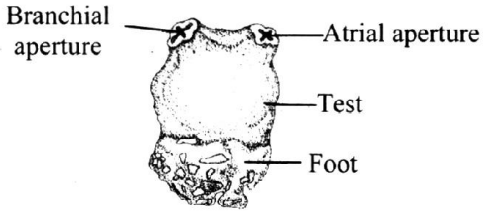
i. Presence of cartilagenous notochord at least in the early embryonic life.
ii. Presence of gill slits in the pharyngeal (neck) region.
iii. Hollow dorsal nerve cord running throughout the length of the body.
iv. The invertebrate chordates are a link between the non-chordates and the chordates.
v. There are two groups of invertebrate chordates, namely urochordates and cephalochordates.
vi. Phylum Chordata is divided into three subphyla:
a. Urochordata b. Cephalochordata c. Vertebrata

**Q.59. Name the various subphyla of phylum chordata.**

**Ans:** Phylum chordata is divided into three subphyla:
i. Urochordata ii. Cephalochordata iii. Vertebrata

**Q.60. Name the sub-phylum of chordata in which notochord is present only in the tail of larva.**

**Ans:** Sub-phylum Urochordata. e.g. Herdmania.



***Herdmania***

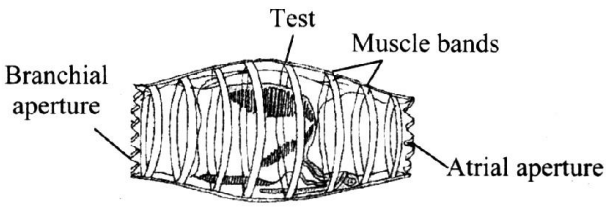
**Q.61. Describe the important characteristics of class Urochordata.**

**Ans:** Members of sub-phylum Urochordata are also called tunicate.

i. **Habitat:**
They are exc Iusively maneil habiitat.

ii. **Body covering:**
Soft body is covered by a covering made up of tunicine. This cover is called as test.

iii. **Notochord:**
Notochord is present only in the tail of the larva



***Salpa***

and is lost during metamorphosis ..

**iv. Respiration:**

Pharynx has many gill slits, for respiration.

e.g. Salpa, Doliolum.

**Q.62. Name the sub-phylum of Phylum Chordata in which notochord extends throughout the length of the body and persists throughout the life.**

**Ans:** The notochord persists throughout the life in sub-phylum Cephalochordata. e.g- Amphioxus.

**Q.63. Classify Amphioxus. Enumerate important characters of the class Cephalochordata.**

**Ans: Classification of Amphioxus:**

Kingdom: Animalia

Phylum: Chordata

Subphylum: Cephalochordata

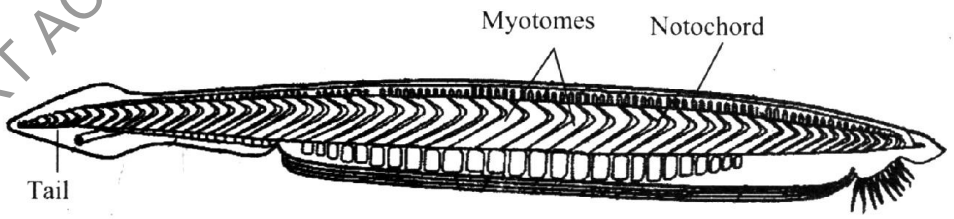
**Important characters of class Cephalochordata:**

i. Cephalochordates are also known as lancelets and are small fish-like animals that rarely exceed 5 em in length.

ii. Lancelets live partly buried in soft marine sediments.

iii. Notochord extends throughout entire length of the body and persists throughout the life.

iv. Presence of pharyngeal gill slits, tail, dorsal nerve cord, are the chordate characteristics of cephalochordates.




*Amphioxus*

**Q.64. Explain in brief the divisions of sub-phylum vertebrata.**

**Ans:** Phylum vertebrata is divided into two divisions: Agnatha (lacks jaw) and Gnathostomata (bears jaw) on the basis of pres encel absence of jaws .

**a. Division Agnatha:**

This division consist of the lowest or most primitive vertebrates that lack jaws.

They include only one class of living vertebrates, the Cyclostomata.

**b. Division Gnathostomata:**

This division includes animals with jaws.

It is divided into two superclasses: Pisces (bear fins) and Tetrapoda (bear limbs).

**Q.65. Write the important characteristics of vertebrates.**

**Ans: Important characteristics of vertebrates are as follows:**

**i. Vertebral column:** A mid-dorsal vertebral columnlbackbone is present.

**ii. Nerve cord:** A single dorsal tubular nerve cord is present.

**iii. Skin:** Skin is two layered with upper epidermis and lower dermis.

**iv. Pharynx:** Pharynx is perforated by pharyngeal gill slits, at least in embryonic stage.

**v. Appendages:** Two pairs of lateral appendages are present.

**vi. Head:** Bears distinct head with mouth and paired sense organs.

**vii. Brain:** Brain is well protected in bony / cartilagenous box called cranium.

**viii. Tail:** Post-anal tail is present at least in the embryonic stage.

**ix. Heart:** Heart is ventral to alimentary canal and is more than one chambered.

Red blood corpuscles: Red blood corpuscles (RBC) are present.

**Q.66. "All vertebrates are chordates, but all chordates are not vertebrates". Justify the statement.**

**Ans:** Both invertebrates and vertebrates possess a notochord at least in the embryonic stage. Hence, both of them are classified as chordates. However, vertebrates are those chordates in whom the notochord is replaced by a vertebral column in later stages of development. This vertebral column is however, not present in the invertebrates in any stage. Thus, we can say that all vertebrates are chordates, but all chordates are not vertebrates.

**Q.67. Give important characteristics of class Cyclostomata.**

**Ans: (cyklos=circular, stoma=mouth):**

i. Jawless and eel-like animals such as Petromyzon (lamprey), Myxine (hagfish) are included in class Cyclostomata.

**ii. Skin:** Skin is soft, smooth, and has unicellular mucous glands. Scales are absent.

**iii. Fins:** Median fins are present, but paired fins are absent.

**iv. Nutrition:** They are ectoparasites with sucking and circular mouth without jaws.

**v. Endoskeleton:** Endoskeleton is fibrous and cartilagenous.

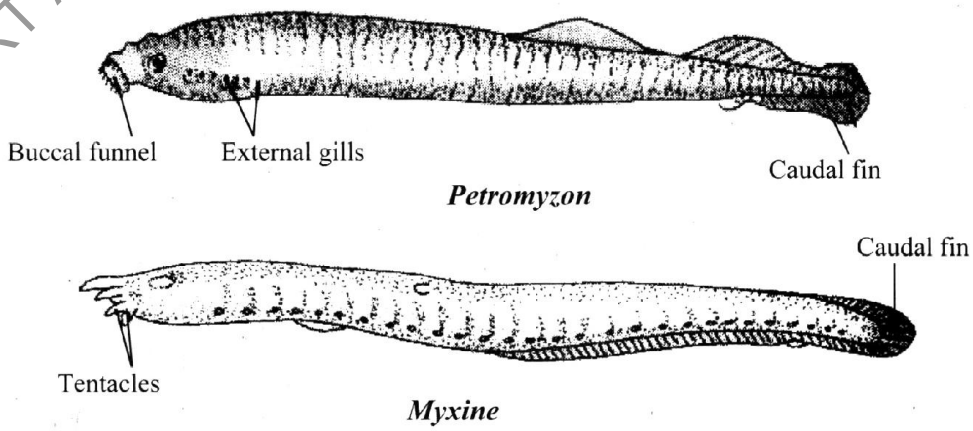
**vi. Notochord:** Notochord persists throughout the life.

**vii. Digestive system:** Digestive system lacks a stomach and the intestine has fold, known as typhlosole.

**viii. Respiration:** Respiration is brought about by 5 to 16 pairs of gill slits.

**ix. Heart:** Heart is two-chambered with one auricle and one ventricle.

**x. Reproduction:** Gonad is single, large without gonoduct. Fertilization is external.




*Petromyzon*

*Myxine*

**Q.68. Mention the superclasses under division Gnathostomata.**

**Ans:** Division Gnathostomata is divided into two superclasses:

i. Superclass : Pisces (bear fins)

ii. Superclass: Tetrapoda (bear limbs)

**Q.69. Explain the important features of super class Pisces.**

**Ans: i. Habitat:** These are aquatic animals and are present in fresh, marine and brackish waters.

**ii. Body temperature:** Pisces are poikilothermic animals i.e., cold blooded animals, in which body temperature changes according to the change in the surrounding temperature.

**iii. Food:** These animals feed on detritus material, planktons, algae, some feed on molluscs and other aquatic organisms.

**iv. Locomotion:** Locomotion is by body muscles and fins. Caudal fin help in steering.

**v. Exoskeleton:** Exoskeleton is made up of dermal scales. Endoskeleton is either bony or cartilagenous.

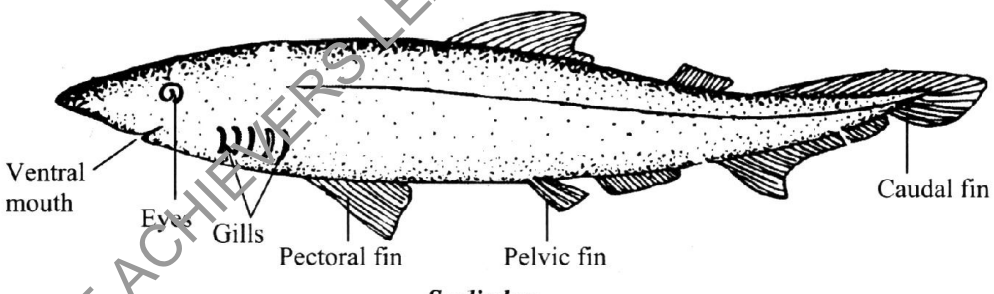
**vi. Body shape:** Body is streamlined and boat-shaped and helps to overcome resistance during swimming.

**vii. Mouth:** Mouth is terminal or ventral in position.

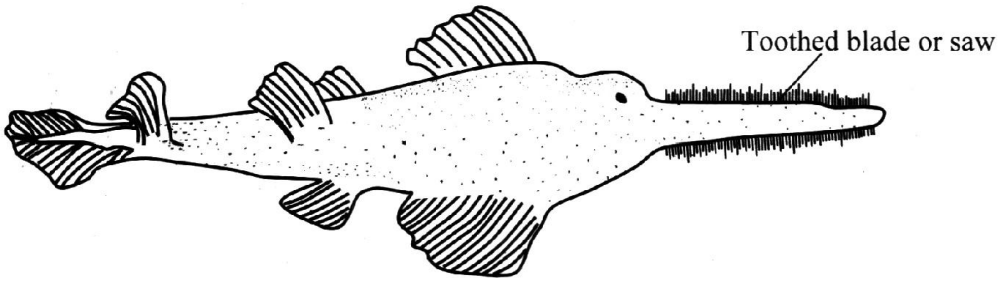
viii. **Respiration:** Respiration is by gills.
ix. **Circulation:** It shows a single closed circulation. Blood cells are present and blood is red in colour. Heart is two-chambered and ventral in position.
x. **Nervous system:** They have a well developed brain with large olfactory lobes.
xi. **Reproduction:** Sexes are separate. Most of the fishes are oviparous, however some are viviparous.
xii. **Superclass Pisces is further divided into two classes:**
   a. **Class:** Chondrichthyes: e.g. Scoliodon,Electric ray, Sting ray.
   b. **Class:** Osteichthyes: e.g. Pomphret, Labeo, Catla, Bombay duck, Lung fish, etc.

**Q.70. Give one difference between cartilagenous and bony fishes.**
**Ans:** In cartilagenous fishes, endoskeleton is cartilagenous, but in bony fishes it is made up of bone.

**Q.71. Explain the important features of class Chondrichthyes.**
**Ans: Chondrichthyes (Chondron = cartilage, ichthyes = fish)**



*Scoliodon*

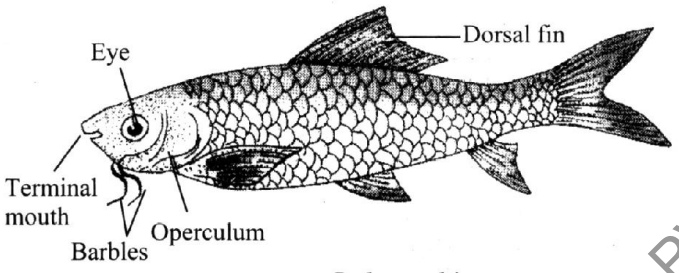


*Sawfish*

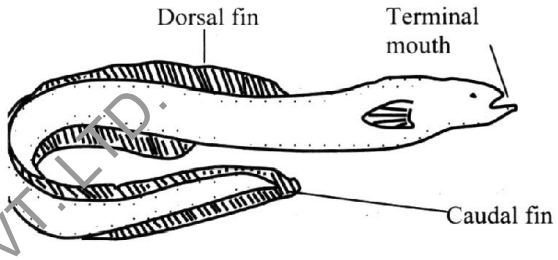
**Characteristics:**
i. **Endoskeleton:** The fishes with a cartilagenous endoskeleton are called cartilagenous fish and are included under class Chondrichthyes.
ii. **Exoskeleton:** Exoskeleton is formed of minute placoid scales.
iii. **Habitat:** These are exclusively marine, i.e. they are found only in sea.
iv. **Mouth:** Mouth is ventral in position.
v. **Dorsal fins:** They have two dorsal fins.
vi. **Copulatory organs:** Male copulatory organs called claspers are present.
vii. **Tail fin:** Tail fin is formed of two unequal lobes, i.e. it is heterocercal (asymmetrical).
viii. **Gill slits:** Five to seven pairs of gill slits are present. Gill slits are not covered by an operculum.
ix. **Fertilization:** Fertilization is internal and these are viviparous animals.
eg. Scoliodon, Electric ray, Sting ray.

**Q.72. Which class includes animals having cartilagenous endoskeleton?**
**Ans:** Class Chondrichthyes includes animals having cartilagenous endoskeleton.

**Q.73. Explain important features of class Osteichthyes.**
**Ans: Osteichthyes (Osteon = bone, ichthyes = fish)**




*Labeo rohita*




**Eel**



i. **Habitat:** These are aquatic, present in both fresh and marine water.
ii. **Skeleton:** In these animals, endoskeleton is mainly made up of bones, hence they are called bony fishes. Exoskeleton is formed of cycloid or ctenoid scales.
iii. **Mouth:** Mouth is terminal in position.
iv. **Dorsal fin:** A single dorsal fin is present.
v. **Claspers:** Claspers are absent.
vi. **Tail fin:** Tail fin is formed by two equal lobes, i.e. it is homocercal (symmetrical).
vii. **Gill slits:** Four pairs of gill slits covered by an operculum (a hard bony flap for protecting gills) are present.
viii. **Fertilization:** Fertilization is external and these are oviparous animals.
e.g. Pomphret, Labeo, Catla, Bombay duck, Protopterus (lung fish), Exocoetus (flying fish), Hippocampus (sea-horse).

**Q.74. Classify Labeo with reasons.**

**Ans: Kingdom:** Animalia (Multicellular, eukaryotic, heterotrophic species, showing locomotion)
**Phylum:** Chordata (Presence of pharyngeal gill slits, hollow dorsal nerve cord extending throughout the body)
**Subphylum:** Vertebrata (Notochord is replaced by vertebral column)
**Division:** Gnathostomata (Jaws are present)
**Superclass:** Pisces (Fins are present)
**Class:** Osteichthyes (Endoskeleton is made up of bones, homocercal tail, claspers absent)
**Genus:** Labeo
**Species:** rohita
It is a fresh water fish. It has cycloid scale and silver coloured body. It has well developed caudal fin and 2M, single dorsal fin.

**Q.75. Distinguish between Pisces and Tetrapods ..**

**Ans:**

| No. | Pisces | Tetrapods |
|---|---|---|
| i. | Exoskeleton is made up of dermal scales. | Exoskeleton is made up of hair, feathers or scales. |
| ii. | These are aquatic. | These are primarily terrestrial. |
| iii. | Heart is 2 chambered. | Heart is 3 or 4 chambered. |
| iv. | Gills are the respiratory organs. | Gills or skin or lungs are the respiratory organs. |
| v. | Various types of fins are present (pectoral, pelvic, dorsal, etc) | Two pairs of limbs are present. |

**Q.76. Distinguish between Cartilagenous fishes and Bony fishes.**

**OR**

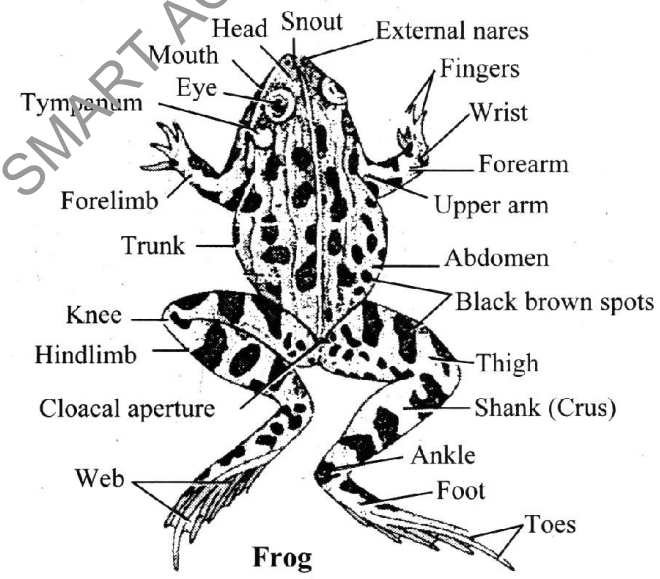
**Distinguish between Chondrichthyes and Osteichthyes.**

**Ans:**

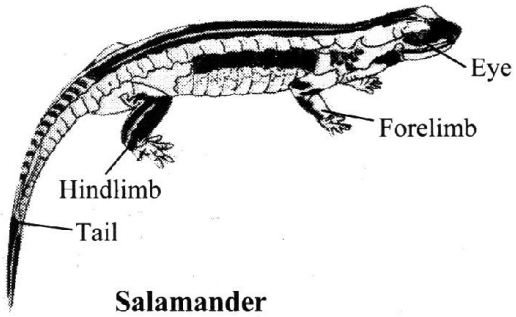
| No. | Chondrichthyes (Cartilagenous fishes) | Osteichthyes (Bony fishes) |
|---|---|---|
| i. | Endoskeleton is made of cartilages. | Endoskeleton is made of bones. |
| ii. | Exoskeleton is made of minute scales called placoid scales. | Exoskeleton is made of large, flat and overlapping cycloid or ctenoid scales. |
| iii. | Mouth is ventral in position. | Mouth is terminal in position. |
| iv. | Two dorsal fins are typically present. | One dorsal fin is present. |
| v. | 5 pairs of gill slits without operculum are present. | 4 pairs of gills covered by operculum are present. |
| vi. | A spiral or scroll valve is present in the intestine. | No spiral valve. |
| vii. | Air bladder is absent. | Air bladder is present. |
| viii. | Tail fin is heterocercal. | Tail fin is homocercal. |
| ix. | Males have copulatory organs called claspers located between the pelvic fins. | Males lack claspers. |
| x. | Fertilization is internal. | Fertilization is external. |
| xi. | Chondrichthyes are viviparous animals. | Osteichthyes are oviparous animals |
| xii. | eg. Shark, sting ray | eg. *Labeo rohita*, Catla |



**Q.77. Describe the general characters of class Amphibia.**
**Ans: Class Amphibia (Amphi = both, bios = life):**



**Frog**



**Salamander**

Class Amphibia includes animals like frog, toad, salamander, Ichthyophis, etc.

i. **Habitat:** These animals live on land as well as in water (fresh water only).
ii. **Food :** Amphibians are carnivorous.
iii. **Body temperature:** Amphibians are poikilothermic animals.
iv. **Body differentiation:** Body is differentiated into head, trunk and tail, neck is absent. Tail is absent in some adults.
v. **Locomotion:** A pair of limbs arising from the pectoral and pelvic girdles respectively helps in locomotion. Webbed digits in frog helps in swimming.
vi. **Skin:** Skin is moist, glandular with mUCDUSglands.
vii. **Exoskeleton:** Exoskeleton is absent.
viii. **Ears:** External ear is absent. Prominent ear drums or tympanic membranes are present on lateral sides of head.

ix. **Digestive system:** Mouth is devoid of teeth, intestine and digestive glands are well developed.
x. **Circulatory system:** Circulatory system is of closed type. Heart is three chambered and ventral. RBCs are biconvex and nucleated.
xi. **Respiration:** Respiration is by skin, lungs and bucco-pharynx.
xii. **Nervous system:** Nervous system is well developed.
xiii. **Reproduction and development:** Sexes are -separate. Amphibians are oviparous. Fertilization is external and development occurs in water. Amphibians show metamorphism.

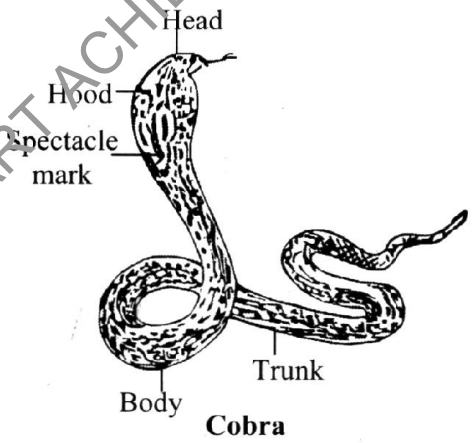
**Q.78. Write the distinguishing features of class Reptilia.**

**OR**

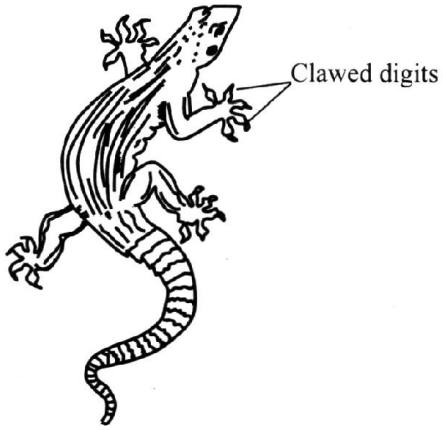
**Give the diagnostic characters of class Reptilia.**

**Ans: Reptilia (Repere = to creep or to crawl):**

i. **Habitat:** Reptiles are crawling animals. They are the first true terrestrial vertebrates. Few may be aquatic or semi-aquatic and are also found in marshy areas.
ii. **Food:** Most of them are carnivorous.
iii. **Locomotion:** Locomotion occurs by limbs in most animals.
The limbs have well developed pentadactyl clawed digits, which help the animal to walk, creep or crawl.
Snakes, however are limbless and crawl on their belly.



**Cobra**



**Wall lizard**

iv. **Exoskeleton:** Skin is dry, non-glandular and covered by an exoskeleton of epidermal scales or plates or scutes.
v. **Ear:** External ear is absent and ear drum is depressed.
vi. **Circulatory system:** Circulatory system is of closed type, heart is ventral in position.
It has two complete auricles and an incompletely divided ventricle". Therefore, heart is not perfectly four chambered (except in crocodile and tortoise, heart is four chambered).
vii. **Respiratory system:** These show respiration by lungs.
viii. **Nervous system:** The brain is well developed. The olfactory Iobes and cerebellum are better developed as compared to amphibians.
ix. **Reproduction:** Sexes are separate and exhibit prominent sexual dimorphism.
Fertilization is internal and the animals are oviparous. Most of the reptiles lay shelled eggs and show little parental care (exception - viper, it is viviparous).
e.g. Cobra, crocodile, turtle, wall lizard, etc.

**Q.79. Name the limbless reptile.**

**Ans:** Snake is a limbless reptile.

**Q.80. Name the reptilians with perfectly four chambered heart.**

**Ans:** Crocodile and tortoise are reptiles with perfectly four chambered heart -.

**Q.81. Name a viviparous reptile.**

**Ans:** Viper is a viviparous reptile.

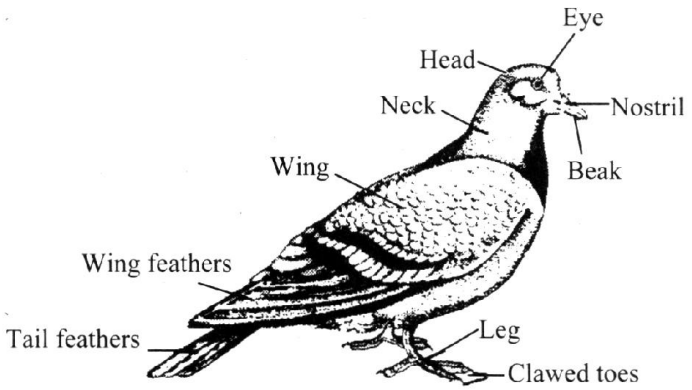
**Q.82. Classify Cobra with reasons.**

**Ans: Kingdom:** Animalia (Locomotion is seen, multicellular, eukaryotic, heterotrophic organisms)
**Phylum:** Chordata (Presence of pharyngeal gill slits, hollow dorsal nerve cord extending throughout the body)
**Subphylum:** Vertebrata (Notochord is replaced by vertebral column)
**Division:** Gnathostomata (Jaws are present)
**Superclass:** Tetrapoda (Two pairs of appendages are present)
**Class:** Reptilia (Locomotion by creeping. Body is covered by plates).
**Genus:** Naja
**Species:** Naja

**Q.83. Write the important features of class Aves.**

**Ans: Class Aves (Avis = Bird):**

i. Class Aves includes birds like Ostrich, Kiwi, Parrot, Pigeon.
**Habitat:** These animals are aerial in habitat.
In order to live an aerial mode of life, birds show certain physical and physiological . characteristics. These are termed as 'aerial adaptations'.
Birds mostly build their nests on branches of trees.



**Pigeon**

**ii. Food:** Most of the birds are herbivores, while some are carnivores. Pigeon

**iii. Locomotion:** Forelimbs are modified into wings for flying. Hind limbs are used for walking and running. Aquatic birds have webs between their toes. This helps in swimming. e.g. Duck.

**iv. Body division:** Body is differentiated into head, neck, trunk and a tail.

**v. Body shape:** Body is streamlined (boat shaped) to reduce resistance during flight.

**vi. Body temperature:** These are warm blooded animals (homeotherms) i.e., keep the body temperature constant irrespective of fluctuation in environmental temperature.

**vii. Exoskeleton:** Exoskeleton is made up of feathers. Scales are present on hind-limbs. Skin is thin, dry and non-glandular.

**viii. Endoskeleton:** Bones are hollow (pneumatic) with air cavities. This makes their body light, making their flight easy.
Jaws are modified into beaks. Teeth are absent.
Special structures such as crop and gizzard are present. These are useful for breaking down the food into smaller pieces.

**ix. Circulatory system:** Circulation is double and closed type.
Blood is red in colour and RBC are biconvex and nucleated.
Heart is ventral in position. It is perfectly four chambered with two auricles and two ventricles.

**x. Respiration:** Respiration occurs by lungs. Presence of air sacs increase the buoyancy.

**xi. Nervous system:** Brain is enlarged with a well developed cerebellum. Optic lobes are well developed, however, olfactory lobes are poorly developed.

**xii. Reproduction:** Sexes are separate and the animals exhibit prominent sexual dimorphism. The female shows presence of only left ovary and left oviduct. This helps to reduce weight during flying.

Fertilization is internal. Avians are oviparous and lay shelled eggs. Eggs have yolk and albumin.

**xiii. Excretion:** Urinary bladder is absent.

Examples of Aves: Ostrich, Kiwi, Parrot, Pigeon.

**Q.84. What are the modifications that are observed in birds that help them fly?**

**OR**

**Give characteristic features that help a bird in flight.**

**OR**

**Give a list of aerial adaptations shown by birds.**

**Ans:** i. In birds, the forelimbs are modified into wings for flying. Hind limbs are adapted for perching, walking and running.

ii. Bones are hollow with air cavities which keeps the body light.

iii. Body is streamlined to reduce resistance of air during flight.

iv. Exoskeleton is made up of feathers which are crucial for flight.

v. Lungs have air sacs which helps to maintain buoyancy during flight.

vi. Cerebellum is well developed for equilibrium.

vii. Urinary bladder is absent.

viii. Females have only one ovary and oviduct (left) to reduce body weight.

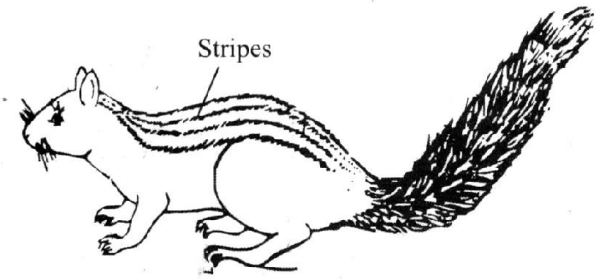
ix. Mouth is without teeth.

**Q.85. Give an example of an aquatic bird.**

**Ans:** Duck is an example of an aquatic bird.

**Q.86. Write the important features of class Mammalia.**

**Ans: Class Mammalia (Mammae = breasts, nipples):**




**Squirrel**


***Pteropus* (bat)**

Class Mammalia includes various animals like squirrel, bat, tiger, etc.

**i. Special feature:** Presence of mammary glands is a unique characteristic of mammals. Mammary glands are modified sweat glands and serve the purpose of nourishment of the young ones.

**ii. Habitat:** Mammals are omnipresent (Present everywhere).
These are mostly terrestrial, some are aquatic and few are aerial and arboreal (living on trees).

**iii. Food:** Most of them are herbivores, few are carnivores and some are omnivores.

**iv. Locomotion:** Limbs are the organs of locomotion and are modified for walking, climbing,' swimming, etc.

**v. Body division:** Body is differentiated into head, neck, trunk and tail.

**vi. Body temperature:** Mammals are homeotherms or warm blooded animals.

**vii. Exoskeleton:** Skin is covered with hair or fur. Besides this nails, claws, horns, etc. may also be present.

**viii. Skin:** Skin is glandular and has sweat glands and sebaceous (oil) glands.

**ix. Body cavity:** Body cavity is divided into two parts namely, thoracic cavity and abdominal cavity by a

diaphragm. Mammals have external ear (pinnae).

x. **Mouth cavity:** Mammals show various types of teeth like incisors, canines, premolars and molars.

xi. **Circulation:** Circulation is double and closed type. RBCs are biconcave and anucleated (except camel). Blood is red in colour.
Heart is ventral in position, four chambered with two auricles and two ventricles.

xii. **Respiration:** Respiration takes place by lungs.

xiii. **Nervous system:** Brain is highly developed. Cerebrum shows a transverse band called corpus callosum. Optic lobes are better developed than olfactory lobes.

xiv. **Reproduction and development:** Except for duck billed platypus, all the mammals are placental and viviparous. Some have pouches for development of immature young ones. These are called marsupials. e.g. Kangaroo.
e.g. Human being, bat, camel, whale, monkey, rat.

**Q.87. Name the egg laying mammals.**
**Ans:** Duck-billed platypus is the egg laying mammal.

**Q.88. Give an example of a flying mammal.**
**Ans:** Bat is an example of flying mammal.

**Q.89. Name the marsupial mammal.**
**Ans:** Kangaroo is a marsupial mammal.

**Q.90. Differentiate between non-chordates and chordates.**
**Ans:**

| No. | Non–chordates | Chordates |
|---|---|---|
| i. | Notochord is absent. | Notochord is present in at least some stage of life. |
| ii. | Nerve cord is double, ventral and ganglionated. | Nerve / Spinal cord is single, dorsal and non-ganglionated. |
| iii. | The heart, if present is dorsal. | The heart is ventral in position. |
| iv. | These may be acoelomate, pseudocoelomate or truly coelomate. | Chordates are all true coelomate. |
| v. | Pharyngeal gill slits are absent. | Pharyngeal gill slits are present at least in embryonic stage. |
| vi. | Digestive system is dorsal. | Digestive system is ventral. |
| vii. | Red blood corpuscles are absent. | Red blood corpuscles are present in few organisms. |
| viii. | Post-anal tail is absent. | Post-anal tail is present at least in embryonic stage. |
| ix. | Limbs, if present, are more than two pairs. e.g. Cockroach. | Limbs, when present, are usually in two pairs. e.g. Frog, man. |

## 8.4 : Zoological Parks and Muscums :

**Q.91. What is a zoological park? Give its significance. OR**
**Write a note on zoological park.**

**Ans: Zoological park:**

A place where a collection of wild animals is kept in captivity for breeding and display to public is called a zoo or zoological park.

**Significance of Zoological Park:**

i. These inform about mode of living, feeding habits and behaviour of wild animals.

ii. The threatened animals also bred to increase their number to prevent their extinction.

**Q.92. Name the governing authority of zoos in India.**
**Ans:** Central Zoo Authority ofIndia (CZA) is the governing authority of all zoos in India.

**Q.93. Name a few zoological parks in India with their locations and type of animals.**

**Ans:**

| No. | Zoological parks | Location | Type of animals |
|---|---|---|---|
| i. | Rajiv Gandhi Zoological Park | Pune [Katraj] | Reptiles, mammals, birds. They have a snake park. |
| ii. | Jijamata Udyan | Mumbai | Endangered species of animals and birds. |
| iii. | Nehru Zoological Park | Hyderabad | 3500 species of birds, animals and reptiles. |
| iv. | Indira Gandhi Zoological Park | Vishakhapattanam | Primates, carnivores, small mammals, reptiles and birds. |
| v. | Padmja Naidu Himalayan Zoological Park | Darjeeling | Endangered animals like snow leopards, red pandas, gorals (mountain goat), Siberian tigers and a variety of endangered bird species. |
| vi. | Allen Forest Zoo | Kanpur | Hyena, Bear, Rhinoceros, Hippopotamus, Langoor, Musk deer, Ostrich, Emu, Crane etc. |
| vii. | Lucknow Zoo | Lucknow | Royal Bengal Tiger, White Tiger, Gibbon, Black Bear, Asiatic Elephant, Great pied, Horn Bill etc. |
| viii. | Alipore Zoological Gardens | Kolkata | Royal Bengal Tiger, African Lion, Hippopotamus, Great Indian One-horned Rhinoceros. |
| ix. | Madras Crocodile Bank Trust | Chennai | Crocodiles and many species of turtles, snakes and lizards. |
| x. | Parassinikkadavu Snake Park | Kannur | Spectacled Cobra, King Cobra, Russell's Viper, Krait and Pit Viper. |



**Q.94. What is a zoological museum? Give its significance.**

**Ans: Zoological museum:** Museum which has collection of preserved animal specimens and skeletons of animals for study and reference are called zoological museums.

**Significance of zoological museum:**

i. The animal specimens are preserved for longer duration by placing them in chemical preservative solutions.

ii. Plants like algae, fungi, mosses and ferns are preserved as these cannot be maintained in the botanical garden.

iii. Larger animals are usually stuffed and preserved.

iv. Zoological museums serve in imparting knowledge about various types of animals to the students as well as to the tourists.

v. They provide first hand information about the character, identification: naming and classification of the various organisms.

**Q.95. Name few Indian Zoological museums with their locations.**

**Ans:**

| No. | Indian Zoological Museum | Location |
|---|---|---|
| i. | The Zoological Museum | Chennai |
| ii. | Indian Museum | Kolkata |
| iii. | Zoology Museum | Muzaffarnagar |
| iv. | Zoological Garden | Thiruvananthapuram |
| v. | Museum of Zoology | Meerut |
| vi. | Shree Bhavani Museum | Aundh, Satara, Maharashtra |
| vii. | Zoological Museum | Jaunpur |

**Q.96. Name few projects started by Indian Government to promote wild life awareness.**

**Ans:** A few projects started by Indian Government to promote wild life awareness are Project Tiger, Nature camps and promoting Jungle lodges.

## Additional Theory Questions :

Q.1. Mention the unique features of Phylum Cnidaria. Refer Q.27.

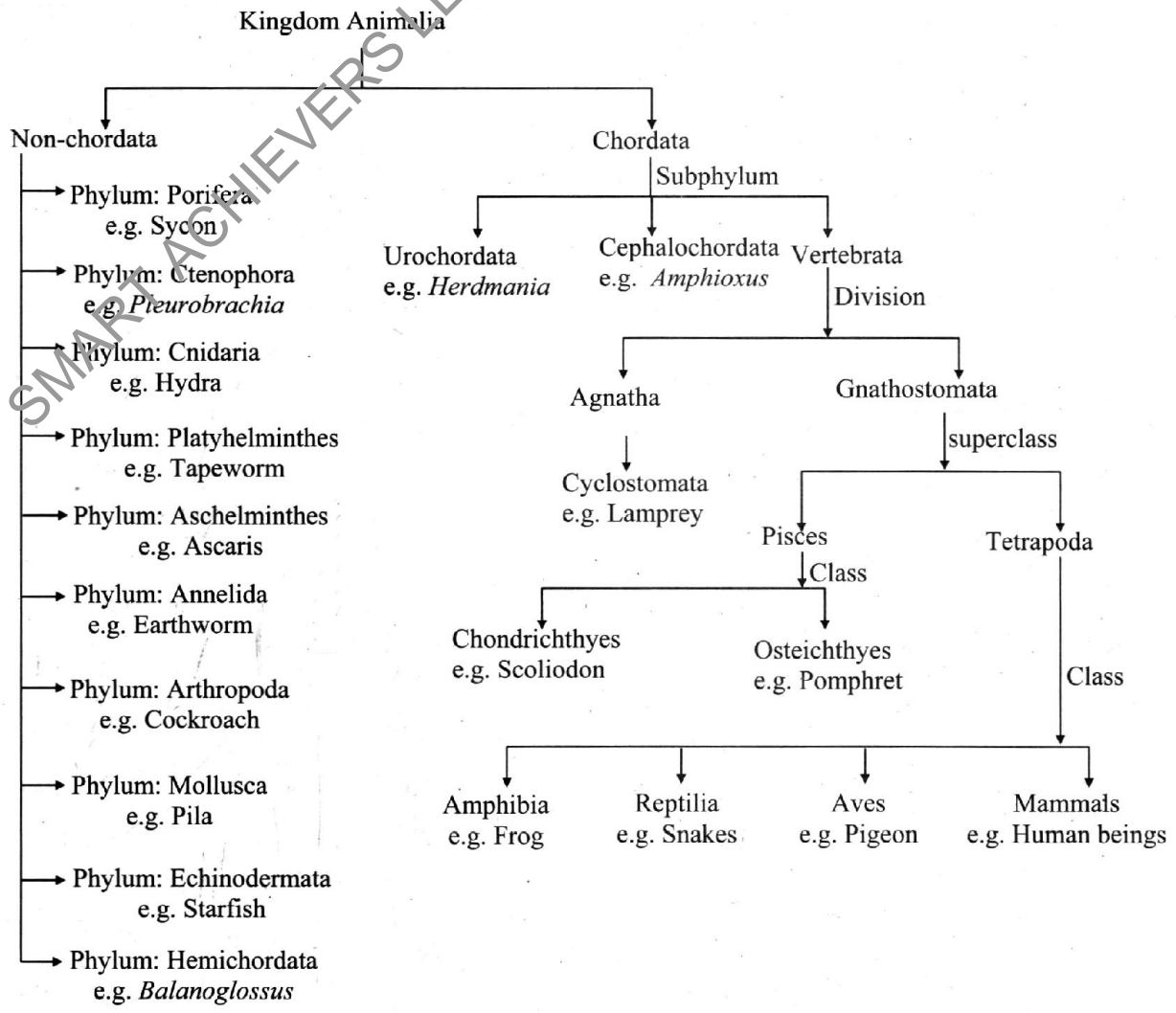
Q.2. Give general characters of Phylum Chordata. Refer Q.58.

Q.3. Write a short note on Urochordata. Give one example. Refer Q.61.

Q.4. Give general characters of phylum chordata and classify Labeo with reasons. Refer Q.58 and Q. 74.

## Quick Review :

- **Classification of animals at a glance :**






❷❶❺

## Multipal Choice Question's

**1.** At present, _____ about animal phyla have been recognized.
a) twenty b) thirty
c) forty d) fifty

**2.** The division of animals into chordates and non-chordates is based on the presence or absence of a
a) notochord b) vertebral column
c) spinal cord d) nerve cord

**3.** The body plan in which the alimentary canal has a single opening is called body plan.
a) open b) blind sac
c) cell aggregate d) tube within tube

**4.** The tube within tube plan is not present in
a) Taenia b) Pheretima
c) Leech d) Ascaris

**5.** The spicules of sycon are made of
a) silica
b) proteinous spongin fibres
c) calcium carbonate
d) All of the above

**6.** _____ contain a stinging structure called nematocyst in their tentacular region.
a) Flame cells b) Choanocytes
c) Cnidocytes d) Blood cells

**7.** The body wall of hydra is
a) monoblastic b) triploblastic
c) diploblastic d) polyblastic

**8.** Flame cells are found in phylum
a) Porifera b) Coelenterata
c) Platyhelminthes d) Arthropoda

**9.** Members of phylum are also called as thread worms or round worms.
a) Platyhelminthes b) Aschelminthes
c) Annelida d) Mollusca

**10.** Nephridia as excretory organs are found in
a) Platyhelminthes b) Annelida
c) Arthropoda d) Porifera

**11.** Segmentation in the body is first observed in which of the followingphylum?
a) Platyhelminthes b) Aschelminthes
c) Annelida d) Arthropoda

**12.** Nervous system is formed by a nerve ring and ganglionated nerve cord in phylum
a) Cnidaria b) Platyhelminthes
c) Nemathelminthes d) Annelida

**13.** The salient character of Arthropoda is
a) soft-bodied animals
b) presence of gastrovascular cavity
c) presence of jointed appendages
d) presence of setae

**14.** _____ is an viviparous arthropod.
a) Scorpion b) Cockroach
c) Silk worm d) Lobster

**15.** Multi-chambered heart is present in
a) earthworm b) cockroach
c) man d) Ascaris

**16.** Main characteristic feature of Mollusca that has given the phylum its name is
a) soft body b) shell
c) foot d) mantle

**17.** 'Organs of Bojanus' is characteristic feature of
a) Porifera b) Mollusca
c) Platyhelminthes d) Hemichordata

**18.** Circulatory system in molluscs is of open type except in
a) Pila b) Oyster
c) Sepia d) Bivalves

**19.** The respiratory pigment haemocyanin ill molluses contains
a) Zinc b) Copper
c) Iron d) Magnesium

**20.** Pentamerous radial symmetry IS the characteristic of phylum
a) Coelenterata b) Porifera
c) Echinodermata d) Annelida

**21.** Which of the following are exclusively marine animals?
a) Cnidarians b) Echinoderms
c) Molluscs d) Arthropods

**22.** Water vascular system is the unique character of
a) Echinodermata b) Arthropoda
c) Proto chordata d) Mollusca

**23.** Members of phylum Hemichordata are also called as
a) Flatworms b) Acorn worms
c) Thread worms d) Ring worms

**24.** Phylum is the connecting link between non-chordates and chordates.
a) Echinodermata
b) Hemichordata
c) Urochordata
d) Cephalochordata

**25.** Notochord is absent in the group
a) Hemichordata b) Chordata
c) Cephalochordata d) Urochordata

**26.** Which one of the following is not a basic chordate character?
a) Presence of dorsal tubular nerve cord
b) Presence of pharyngeal gill slits
c) Presence of notochord
d) Presence of dorsal heart

**27.** Vertebral column develops from
a) nerve cord
b) cranium
c) pharyngeal gill- slits
d) notochord

**28.** The soft body of Urochordates is covered by a covering called test made of
a) chitin b) scales
c) tunicine d) operculum

**29.** In urochordata, notochord is situated in the
a) head region b) trunk region
c) tail region d) abdomen

30. Which one of the Scales are not found in Cephalochordata?
a) Amphioxus
b) Lancelets

**32.** _____ are the first true terrestrial vertebrates.
a) Amphibians b) Reptiles
c) Aves d) Mammals

**33.** _____ is a poikilothermic animal.
a) Fish b) Bird
c) Snake d) Both a) and c)

**34.** Heart is perfectly four chambered in
a) snake b) garden lizard
c) crocodile d) varanus

**35.** Pneumatic bones are present in
a) amphibians b) aves
c) reptiles d) aerial mammals

**36.** Thin walled air sacs are connected with lungs in
a) amphibians b) reptiles
c) aves d) mammals

**37.** _____ glands are present in mammals.
a) Mammary b) Sweat
c) Sebaceous d) All the three

**38.** Mammary glands are modified
a) salivary glands b) sweat glands
c) sebaceous glands d) lacrymal glands

**39.** Ear pinna is present in
a) fish b) amphibia
c) mammals d) birds

**40.** Which of the following zoological parks is/are located in Maharashtra?
a) Rajiv Gandhi Zoological Park
b) Jijamata Udyan
c) both a) and b)
d) neither a) nor b)

**41.** The Zoological garden present in Junagadh, Gujarat is
a) Sakkarbaug Zoological Garden
b) Allen Forest Zoo
c) Alipore Zoological Garden
d) Marble Palace Zoo

**42.** Nandankanan Zoo is in
a) Chennai b) Orissa
c) Assam d) Bihar

**43.** Shree Bhavani museum is located in
a) Maharashtra b) Orissa
c) Uttar Pradesh d) Meerut

**2015**



## Answer Keys

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. b) | 2. a) | 3. b) | 4. a) | 5. d) | 6. c) | 7. c) | 8. c) | 9. b) | 10. b) |
| 11. c) | 12. d) | 13. c) | 14. a) | 15. b) | 16. a) | 17. b) | 18. c) | 19. b) | 20. c) |
| 21. b) | 22. a) | 23. b) | 24. b) | 25. a) | 26. d) | 27. d) | 28. c) | 29. c) | 30. d) |
| 31. c) | 32. b) | 33. d) | 34. c) | 35. b) | 36. c) | 37. d) | 38. b) | 39. c) | 40. c) |
| 41. a) | 42. b) | 43. a) | | | | | | | |
| | | | | | | | | | |