

For BioResire students



NEET Biology Material

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CLASSIFICATION OF ANIMALS

PHYLUM-PORIFERA
Porifera

- Cellular, Acoelomate, Asymmetrical.
- Body with oval, spicules and choanocytes and canals in walls.
- Hermaphrodite.

EG:- Sycon, Spongia

PHYLUM-MOLLUSCA
Mollusca

- Second largest phylum.
- Organ system, Coelomate
- Bilateral symmetry.
- Body segmented having head, muscular foot & visceral hump.
- Mouth has radula.

EG:- Snail, Octopus, squid, etc.

PHYLUM-ECHINODERMATA
Echinodermata

- Organ system, Coelomate.
- Radial symmetry.
- Spine bodies.
- Endoskeleton of Calcium carbonate ossicles.
- Water vascular system present.

EG:- Starfish, sea urchin etc.

PHYLUM-Cnidaria
Cnidarata/ Cnidaria

- Tissue level, Acoelomate, Radial symmetry.
- Cnidoblasts present.
- Two body forms- Polyp and Medusa.
- Alternation of generation, metagenesis.

EG:- Sea Anemone, sea fan and Brain Coral.

PHYLUM-ARTHROPODA
Arthropoda

- Largest phylum.
- Organ system, Coelomate.
- Bilateral.
- Respiratory organs present.
- Body divided into - head, thorax and abdomen.
- Jointed appendages.
- Excretory organ - Malpighian tubules.

EG:- Scorpion, Butterflies, mosquito, prawn, etc.

PHYLUM-CTenophora
Ctenophora

- Tissue level, Acoelomate, Radial symmetry.
- Comb plates for locomotion.
- Bioluminescence

EG:- Pleurobrachia and Ctenophora.

PHYLUM-ANnelida
Annelida

- Organ system, Coelomate, Bilateral symmetry.
- Body segmentation - Metamers.
- Parapodia - Lateral appendages.
- Nephridia for excretion and osmoregulation.

EG:- Earthworm and Leech.

PHYLUM-PLATyhelminthes
Platyhelminthes

- Organ and organ system, Acoelomate, Bilateral symmetry.
- Flat body, hooks & suckers, Flame cells.

EG:- Liver fluke & Tape worm

PHYLUM-ASChelminthes
Aschelminthes

- Organ system, Pseudocoelomate Bilateral symmetry.
- Body round, dioecious.
- Digestive system complete.
- Muscular pharynx.

EG:- Round worm, flarial worm and hook worm.

MAMMALIA
Class Mammalia

- Mammary glands present.
- Skull have hair homiothermous.
- External ear or Pinna present.

EG:- Platypus (oviparous), Kangaroo, Blue whale, Common Dolphin (viviparous)

AVES
Class Aves

- Presence of feathers, beak & wings.
- Bones long & hollow - pneumatic.
- Heart - 4 chambered.
- Hemiotherms.

EG:- Crow, Pigeon, Penguin, etc.

REPTILIA
Class Reptilia

- Body covered with scales and scutes.
- Heart - 3 chambered (except crocodile).
- Poikilothermous.

EG:- Cobra, Alligator, Tortoise, etc.

AMPHIBIA
Class Amphibia

- Live in aquatic & terrestrial habitats.
- Body divided into head & trunk.
- Heart - 3 chambered.
- Poikilothermous.

EG:- Toad, frog, Salamander

OSTEICHTHYES
Class Osteichthyes

- Bony fishes.
- Gill slits covered by operculum.
- Air bladder present.

EG:- Flying fish, Rohu, Sea horse, etc.

CHONDRICTHYES
Class Chondrichthyes

- Cartilaginous fishes.
- Gill slits without operculum.
- Placoid scales on skin.
- Electric organ (Torpedo) & sting ray.
- Poison sting present.

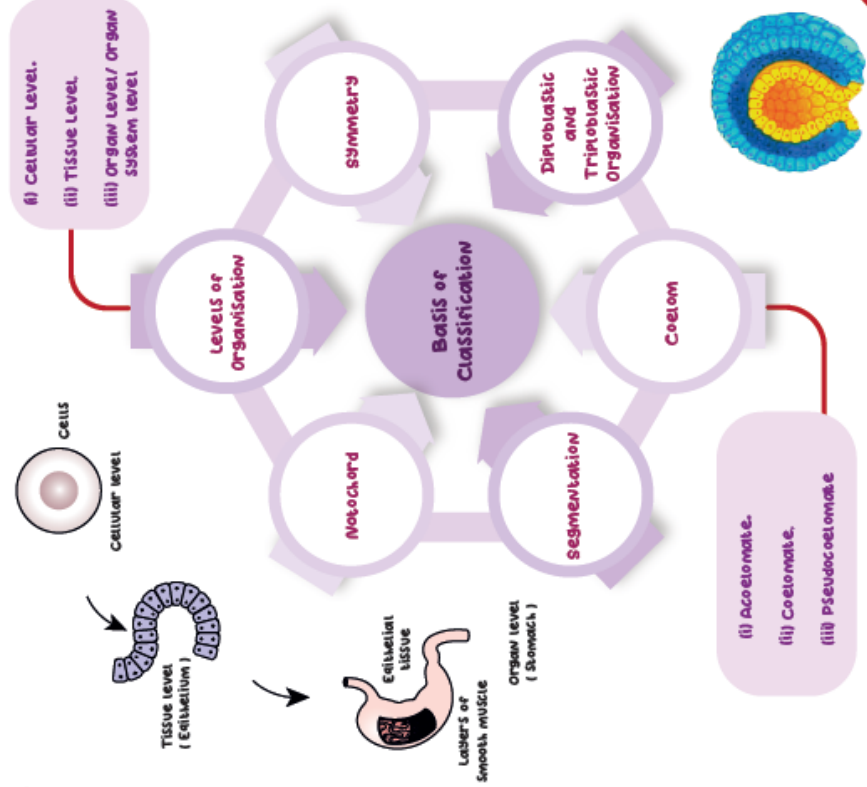
EG:- Dog fish, Saw fish, etc.

CYCLOSTOMATA
Class Cyclostomata

- Sucking & circular mouth without jaws.
- Cartilaginous cranium & vertebral column.
- Gill slits present.

EG:- Lamprey & Hagfish

VERTEBRATA (Notochord replaced by bony/ cartilaginous vertebral column)



Basis of classification

The classification of the animal kingdom is based on the different essential characteristics such as level of organization, habitat, symmetry.

Levels of Organization

- Cellular Level of Organization
- Tissue Level of Organization
- Organ Level of Organization
- Organ system Level of Organization

Patterns of organ systems

- Digestive System (Incomplete Digestive System and Complete Digestive System)
- Circulatory System
- Open Type
- Closed Type

Body symmetry

- Bilateral Symmetry
- Radial Symmetry
- Asymmetrical

Levels of Organisation

All members of Animalia are multicellular, heterotrophic eukaryotes. But, all of them do not exhibit the same pattern of organization of cells. The cells in their body are of several types. These are organized into several functional units of progressively increasing complexity.

Cellular Level

In this level, the body shows some division of labour among cells. They are remarkably independent and can change their form and function. It is found in sponges. The body consists of many cells arranged as loose cell aggregates but, the cells do not form tissues.

Tissue Level

Here, in coelenterates, the arrangement of cells is more complex. The cells performing the same function are arranged into tissues, hence is called tissue level of organization.

Organ Level

In Platyhelminthes and other higher phyla, tissues are grouped together to form organs, each specialized for a particular function, i.e., organ level organization is present.

Organ System Level

In animals like annelids, arthropods, molluscs, echinoderms and chordates, organs have associated to form functional systems, each system concerned with

a specific physiological function. This is called organ system level of organisation. Organ systems in different groups of animals exhibit various patterns of complexities.

Like the digestive system in Platyhelminthes has only a single opening to the outside of the body that serves as both mouth and anus and is thus, called incomplete.

A complete digestive system has two openings, i.e., mouth and anus.

Symmetry

The symmetry refers to the arrangement of parts on the opposite sides of the body of a three dimensional animal.

On the basis of symmetry, animals can be of following types:

Asymmetrical:

Animals in which, any plane passes through the center does not divide them into equal halves such animals are called asymmetrical, e.g., Sponges.

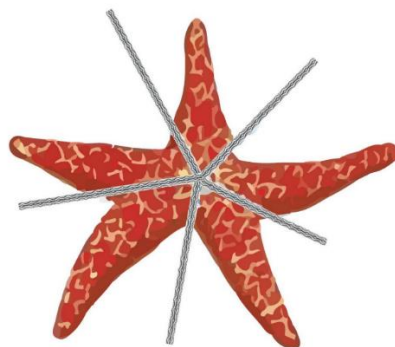
Symmetrical:

The body of some animals can be divided into two similar equal halves by one or more planes. Such animals are called symmetrical

The symmetry can be further divided as:

Radial Symmetry

When any plane passing through the central axis of the body divides the organism into two identical halves, it is called radial symmetry, e.g., Coelenterates, ctenophores and echinoderms.



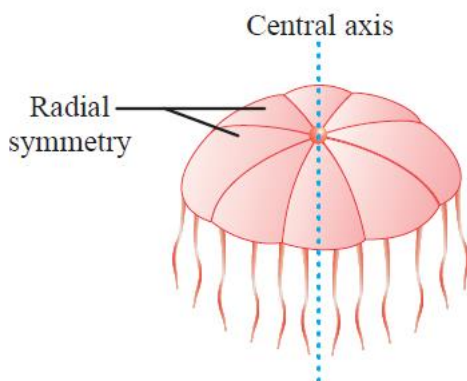
Radial symmetry

Bilateral Symmetry:

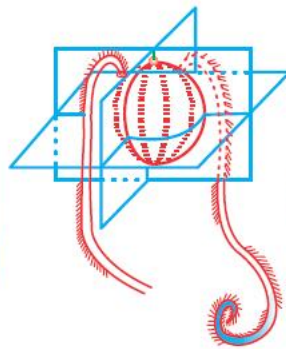
In some animals, body can be divided into identical left and right halves in only one plane. This is called bilateral symmetry, e.g., Annelids, arthropods, etc.



Bilateral symmetry



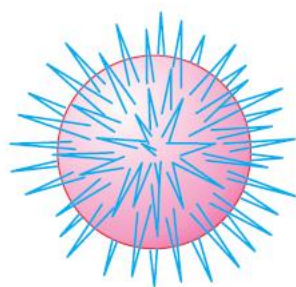
Radial symmetry



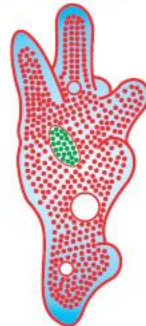
Biradial symmetry



Bilateral symmetry



Spherical symmetry

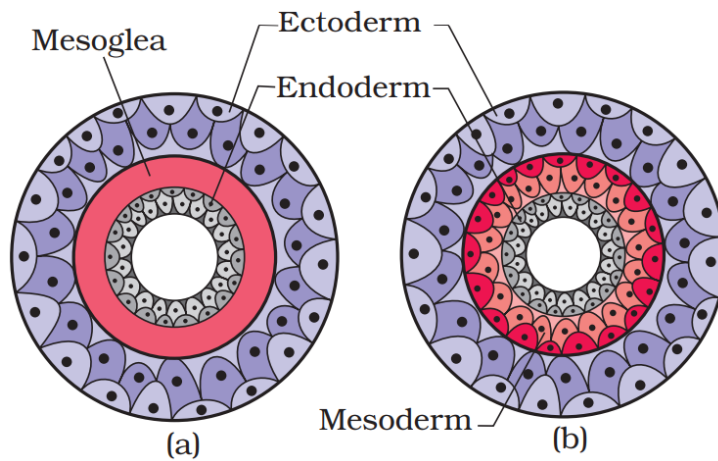


Assymetrical

Diploblastic and Triploblastic Organisation

Germ layers are group of cells behaving as a unit during early stages of embryonic development. It differentiate to give rise to all the tissues/ organs of the fully formed individuals.

On the basis of germ layers animals are classified as follows:



Diploblastic

Animals in which the cells are arranged in two embryonic layers an external ectoderm and an internal endoderm, are called diploblastic animals. In addition, an undifferentiated layer, mesoglea is present in between the ectoderm and the endoderm. e.g., Coelenterates.

Triploblastic

The animals in which the developing embryo has a third germinal layer mesoderm, in between the ectoderm and endoderm are called triploblastic animals, e.g., All animals from phylum-Platyhelminthes to phylum-Chordata.

Coelom

The body cavity (between the body wall and gut wall) which is lined by mesoderm is called coelom. The presence or absence of coelom is very important in classification. On the basis of coelom, animals can be classified in three different groups.

Acoelomates

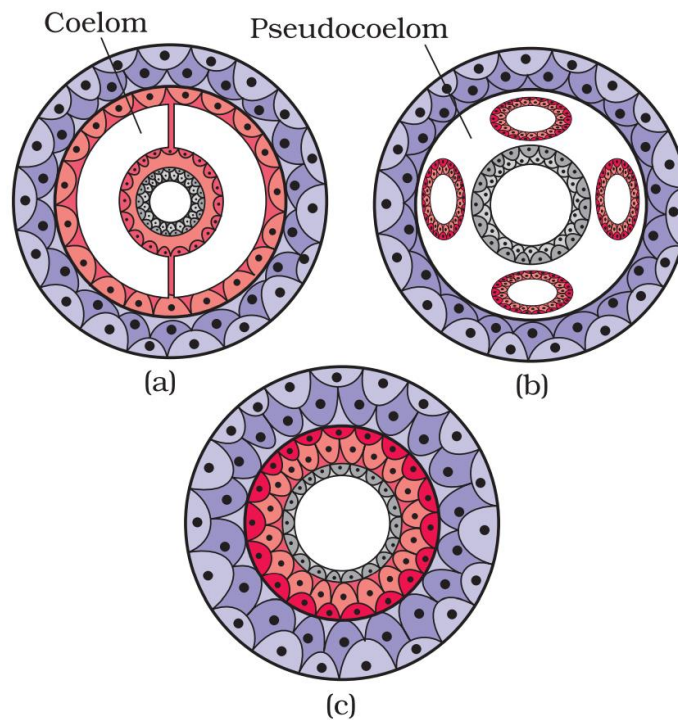
The animals in which the body cavity is absent are called acoelomates, e.g., Poriferans, platyhelminthes, coelenterates, ctenophors and flatworms.

Pseudocoelomates

In some animals, the body cavity is not lined by mesoderm. Instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. Such a body cavity is called pseudocoelom and the animals possessing them are called pseudocoelomates, e.g., Aschelminthes.

Coelomates

The animals having true coelom are called coelomates. A true coelom arises within mesoderm and is therefore, lined by mesodermal tissues, i.e., externally by parietal peritoneum and internally by visceral peritoneum.



Diagrammatic sectional view of:
 (a) Coelomate (b) Pseudocoelomate (c) Acoelomate

Body Plan

Animals have three types of body plans. These are:

Cell aggregate plan: The body consists of a cluster or aggregation of cells which have rudimentary differentiation but are not organized into tissues or organs. The cells are specialized, organised into tissues and show division of labour. It is found in coelenterates and flatworms.

Blind sac body plan

A blind sac body plan is characterized by a digestive cavity that has a single aperture, which functions as mouth and anus. The cells are specialized and they have a division of labour. Digestion is both intracellular and extracellular. Coelenterates are diploblastic animals and possess a blind sac body plan. The body has a single aperture that functions as mouth and anus. The opening is guarded by tentacles which helps to catch the prey. The digestion takes place in the gastrovascular cavity.

Tube Within a Tube Body Plan

Overview of Tube Within A Tube Body Plan. Embryological development: Most of the metazoans possess tubes within the tube body plan and it mainly relies on the development of germ layers and the central cavity coelom.

Segmentation

In some animals, the body is externally and internally divided into segments or somites with a serial repetition of at least some organs.

There are two types of segmentation:

Metameric Segmentation:

A segmentation that simultaneously divides body both externally and internally is called metamerism or metameric segmentation. This kind of segmentation is

found in annelids, arthropods and chordates.

Pseudometamerism:

It is found in tapeworm, the body is divisible into parts or segments called proglottides. They develop from the neck but are not embryonic in origin or true repetition which appears due to repeated budding as known as false segmentation or pseudometamerism.

Notochord

It is a mesodermally derived rod-like structure formed on the dorsal side during embryonic development in some animals.

Animals with notochord are called chordates and those animals which do not form this structure are called non-chordates, e.g., Porifera to echinoderms.

Cephalisation

It is the differentiation of head in anterior part of the body. It involves the concentration of nervous tissue and sense organs in the head.

Appendages

The projecting structures of the body that perform specific functions like locomotion, capturing of food, sensation, etc., are called appendages, e.g., Wings, fins, limbs, tentacles, parapodia, setae, etc.

Digestive System

Digestive tract is the passage through which food is taken for digestion, absorption and egestion. The digestive tract that has a single opening for both ingestion and egestion is called incomplete digestive tract, e.g., in flatworms and coelenterates. The digestive tract with two external openings, one for ingestion and other for egestion is called complete digestive tract. It is present in aschelminthes and higher animals.

Respiratory System

Respiration occurs in different ways in different animals:

- The tiny aquatic animals like Amoeba, Hydra, etc., respire through the body surface. This is called body surface respiration.
- Larger aquatic animals have special organs called gills for respiration. This is called branchial respiration, e.g., In prawns, fishes and mussels.
- The land animals respire through lungs. This is called pulmonary respiration. It occurs in frogs, snails, lizards, birds, and mammals.
- Insects have tracheal respiration, which occurs through trachea i.e., an intercommunicating tube through which gas exchange occurs.
- In animals like earthworm, leech, frogs etc., moist skin acts as respiratory surface. This is called cutaneous respiration.
- Scorpions have book lungs and king crabs have book gills for respiration.
- In frog, gas exchange also occurs through the lining of buccopharyngeal cavity. Hence, called buccopharyngeal respiration.

- Frogs have three modes of respiration, i.e., Cutaneous, buccopharyngeal and pulmonary.

Excretory System

1. Excretory system is involved in the removal of nitrogenous waste products from the body of an organism with the help of excretory organs.
2. The excretion occurs in different ways in different organisms. Such as
3. The excretory organs are absent in those organisms where organization level is below the tissue level. Here, each individual cell takes part in excretion.
4. In animals like sponges, coelenterates, all the cells are in contact with water. Excretion occurs by general body surface.
5. In vertebrates, kidneys are the excretory organs.

Based on excretory products animals can be classified into four categories as given below:

- Aminotelic, excretory product is amino acids, e.g., Starfish, Unio, etc.
- Ammonotelic, excretory product is ammonia, e.g., most invertebrates and some molluscs.
- Ureotelic, excretory product is urea, e.g., Cartilaginous fishes, snail, prawn, mammals and aquatic reptiles.
- Uricotelic, excretory product is uric acid, e.g., Insects, terrestrial crustaceans, lizards, snakes, birds etc.

Nervous System

The nervous system is the aggregation of nerve cells that help in coordinating and controlling various activities of the body.

Endocrine System

The endocrine glands are also called ductless glands. These secrete hormones. Endocrine glands occur in all vertebrates and in some invertebrates (like insects).

Sensory System

This system consists of specialized cells, tissues and organs which can pick up a stimulus and transmit the same to the nervous system.

Sensory system consists of different structures in different organisms, e.g., Antennal (tactile and smell), tentacles (tactile), skin (tactile), statocyst (balancing), ear (hearing), olfactory epithelium (smell), taste buds (taste), eyes (vision), lateral line organs (current receptors), etc.

Skeletal System

Skeletal system is a hard, internal or external framework that provides support and shape to the body. Some animals which are devoid of a skeleton have soft body, e.g., Platyhelminthes, aschelminthes, annelida.

Skeleton system can be of following types:

Exoskeleton:

It is the hard supporting and protective framework present on exterior of the body. It is made of non-living matter, e.g., External shells of molluscs, cuticle of arthropods, scales of fishes and reptiles, feathers of birds, hair, hoofs, nails, horns and claws of mammals.

Endoskeleton:

It is a hard supporting framework present in the interior of the body. In invertebrates such as sponges, it is made up of calcareous or siliceous spicules. In vertebrates, it is composed of hard living tissues called cartilages and bones. Endoskeleton supports whole body of an organism.

Sex

Animals generally have sex organs to produce sexual reproduction. When both male and female sex organs are found in some individual, it is called hermaphrodite or bisexual or monoecious, e.g., Liver fluke, tapeworm, earthworm, leech, etc.

The animals with either female or male sex organ is known as unisexual or dioecious, e.g., Frog, lizards, birds, dog, etc. When male and female can be distinguished on the basis of external features, the condition is called sexual dimorphism, e.g., Lion and lioness, man and women, peacock and peahen, etc.

Reproduction

Reproduction in organisms can be either asexual or sexual.

Asexual Reproduction:

This kind of reproduction does not involve fusion of gametes. It is found in lower animals like sponges, coelenterates, annelids, platyhelminthes. The common methods are budding, fission, fragmentation and regeneration.

Sexual Reproduction:

It involves formation and fusion of gametes. The male gametes called sperms are motile while, the female gametes called ova are generally non-motile.

Fertilization

External Fertilization:

Animals such as many invertebrates, some marine fishes and most amphibians, shed both eggs and sperms into water, where fertilization and development occur. This is called external fertilization.

Internal Fertilization:

In land animals and some aquatic animals, the sperms are introduced by the male into reproductive tract of female during copulation. This is called internal fertilization.

Fertilization occurs in the genital organs of the female.

Oviparous Animals

Egg-laying animals are called oviparous animals. In these animals' fertilization is

internal, but embryonic development is external. In external embryonic development, the embryo develops outside the female body. In these animals, the females lay eggs, in which embryonic development takes place. The developing embryo gets nutrition from the reserve food. This condition is called oviparity. The young ones hatch out of eggs after full development.

Viviparous Animals

Animals that give birth to young ones are called viviparous animals. In these animals both fertilization and embryonic development are internal. In internal embryonic development, the embryo develops inside the female body. The developing embryos get total nutrition and oxygen from the mother. This condition is called matrotrophy. In these animals, the young ones are delivered out of the female womb after full development.

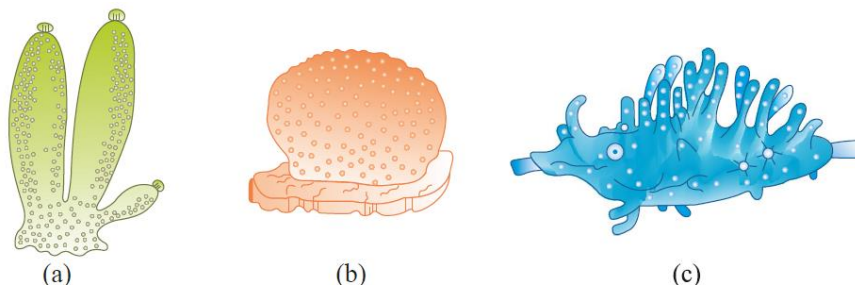
Examples of viviparous animals are a few snakes and mammals except duckbill platypus and echidna.

Non chordate

- They are cylindrical, triploblastic, coelomate, or pseudocoelomate animals.
- Respiration in these animals takes place through gills, trachea or body surface.
- Most of the times, sexes cannot be distinguished among the members.
- Modes of reproduction involve sexual and asexual Fertilization is external, though internal fertilization also occurs in.
- The body of non-chordates generally includes an open type of circulatory system.

Characteristic Features of Phylum Porifera:

1. They are generally marine aquatic organisms, with a few freshwater species.
2. Their bodies are asymmetrical.
3. Body shape can be cylindrical, vase-like, rounded or sac-like.
4. They are diploblastic animals with two layers, the outer dermal layer and the inner gastral layer. There is a gelatinous, non-cellular mesoglea, in between these two layers.
5. The body has many pores called the ostia and a single large opening called osculum at the top.



Example of Porifera: (a) Sycon, (b) Euspongia, (c) Spongilla

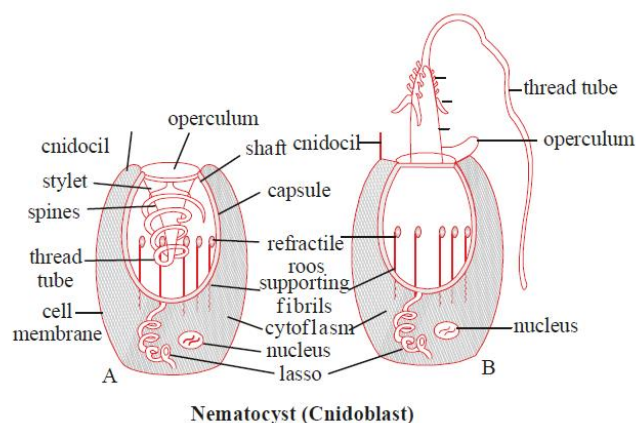
Class Common Name of Some Sponges

Biological Name	Common Name
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Sycon	Crown Sponge
Spongilla	Freshwater Sponge
Euplectella	Venus flower basket
Euspongia	Bath Sponge
Cliona	Boring Sponge
Pheronema	Bowl Sponge
Haliclona	Finger Sponge

Phylum Coelenterata (Cnidaria)

There are about 9000 species of cnidarians. The name Cnidaria (Knick nettle or sting cells) is derived from the stinging cell or cnidoblasts present on the ectoderm of tentacles and body of these animals.



Nematocyst (Cnidoblast)

Advancement Over Sponges

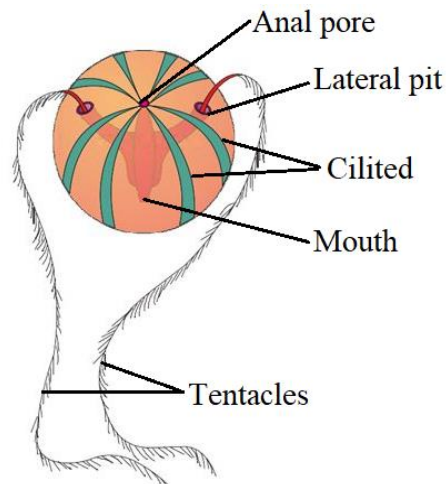
The cnidarians or coelenterates exhibit advancement over sponges, as they possess a tissue level of organization of the body with well defined layers of cells and a digestive cavity.

Phylum Ctenophora

Phylum-Ctenophora (Comb; pores bearing) or comb jellies or sea walnuts are exclusively marine forms. The term 'Ctenophora' was coined by Georges Cuvier. It includes about 50 species.

General Features important general features 'phylum Ctenophora are below:

- **Habitat and Habit** These are of exclusively marine forms. They are found solitary; pelagic or free swimming.
- **Body Organization** They are diploblastic, acoelomate with tissue grade of organization. Body is soft, delicate, transparent and gelatinous, like jelly fishes without segmentation.
- **Body Symmetry** They are biradially symmetrical. The arrangement of comb plates gives the appearance of radial symmetry, the tentacles and branching of gastrovascular canals show bilateral symmetry.
- **Digestive System** Digestion is both extra cellular and intracellular. Skeletal, circulatory, respiratory and excretory systems are absent.



Pleurobrachia
Example of Ctenophora

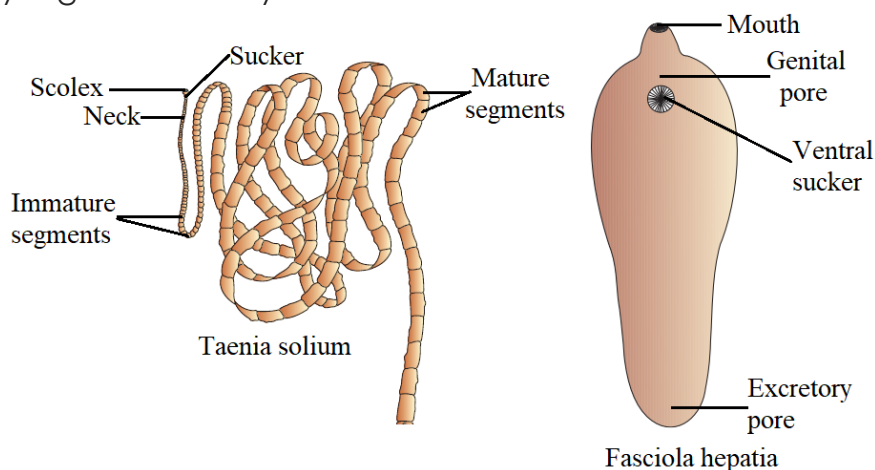
Phylum Platyhelminthes

Phylum Platyhelminthes (Platy flat; helminth worm) include flatworms. The group include the first simplest triploblastic group of animals. Gegenbaur coined the term 'Platyhelminthes'. It includes about 12,000 species of animals. They have leaf like or ribbon like body.

General Features:

Some important general features of phylum-Platyhelminthes are discussed below:

- Habit and Habitat Majority of forms are parasitic (tapeworms, liver flukes, blood flukes), etc., and free-living forms (planarians). Hooks and suckers are present in parasitic forms.
- Symmetry The body is bilaterally symmetrical with definite orientation like anterior and posterior end.
- Cephalization Primitive cephalization is present in free-living flatworms.
- Germ Layers They are triploblastic.
- Body Cavity They are acoelomate. The space between the body wall and body organ is filled by.



Examples of Platyhelminthes

Phylum Aschelminthes

Phylum Aschelminthes or Nematelminthes or Nematoda (Nema thread; helminth worms) includes roundworms. They are commonly called as nematodes.

General Feature of Phylum Aschelminthes:

Some important general features of phylum- aschelminthes are discussed below:

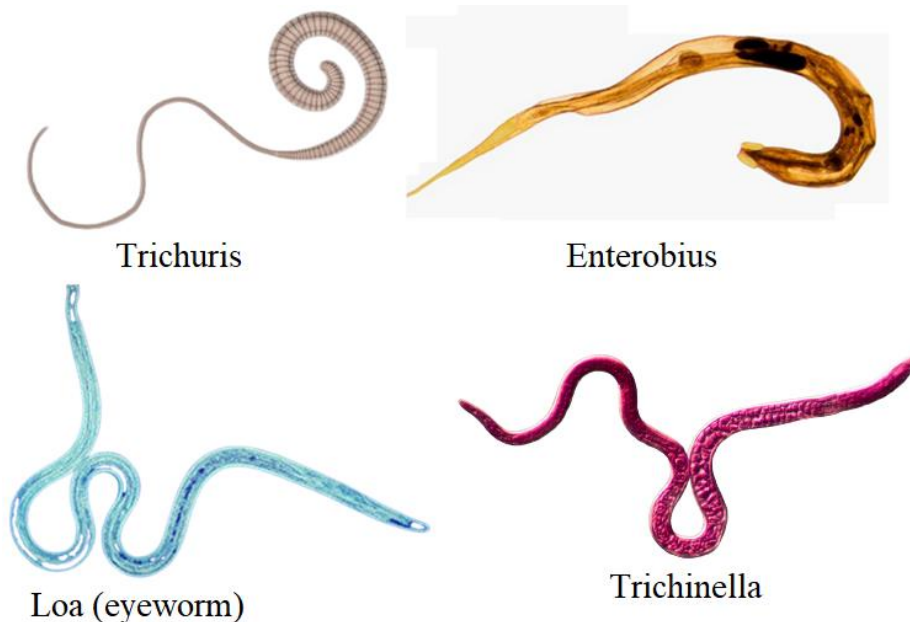
- Habitat and Habit They are mostly free living and may occur in water or within the soil. There are several parasitic species which live within the body of animals or plants, e.g., Guinea worms, whipworms, eyeworms, etc.
- Symmetry They show bilateral symmetry and have organ system level of organization.
- Germ Layers They are triploblastic animals and have tube within tube body plan.
- Body Wall The body wall contains an outer cuticle, syncytial epidermis and a muscle layer. Circular muscles are absent.

Advancement Over Flatworms

Aschelminthes show advancement over flatworms as they contain complete alimentary canal and sexes are separate.

Disease Caused by Aschelminthes:

- *Ascaris lumbricoides* or giant intestinal roundworm is an endoparasite of the small intestine of humans. It causes ascariasis.
- *Wuchereria (filaria)* or filarial worm is an endoparasite in the lymphatic vessels and lymph nodes of humans. It causes elephantiasis in the legs, arms, scrotum, etc.
- *Ancylostoma duodenale* or hookworm is an endoparasite in the small intestine of humans. It causes ancylostomiasis disease.
- *Loa loa* the eyeworm lives in subdermal connective tissue of man. It causes loiasis disease characterised by subcutaneous swelling around the eyes.



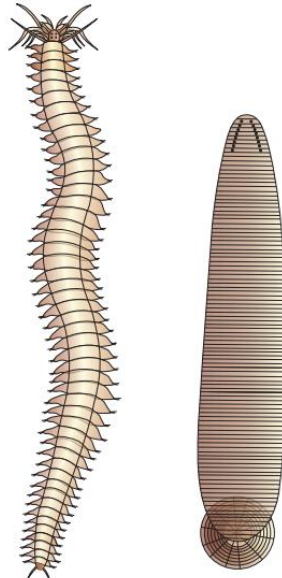
Some Example of Aschelminthes

Phylum Annelida

Phylum—Annelida (Annulus — ring; lidos — form) includes segmented worms. The & term 'Annelida' was first coined by Lamarck (1809). It includes about 12,000 species of animals.

General Features of Phylum Annelida:

- Habit and Habitat They may be aquatic, terrestrial and free-living or parasitic.
- Body Wall The outermost covering of body is thin and moist cuticle secreted by the epidermis.
- Metamerism The body is divided into segments or metameres by ring like grooves-the annuli. It is called metameric segmentation. The segmentation is external as well as internal.
- Symmetry Annelids are bilaterally symmetrical.



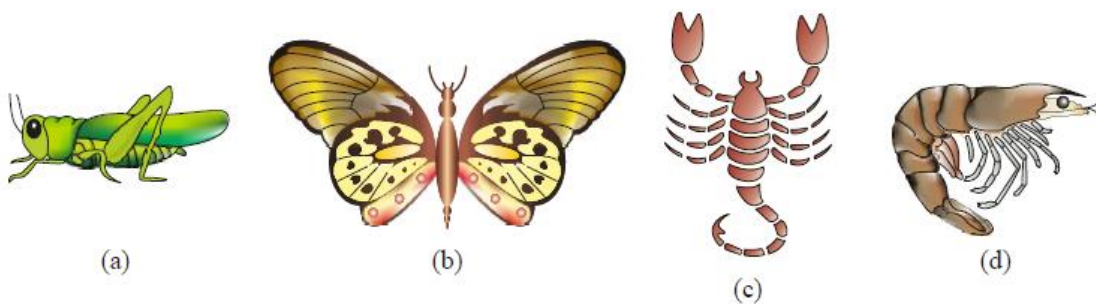
Nereis

Hirudinaria

Some Examples of Annelida

Phylum Arthropoda

Phylum-Arthropoda (Arthron – jointed; podos — foot) include the first and simplest segmented animals. These are commonly called as jointed legged animals. It is the largest group of animals that include about 1,000,000 insect species, 1,02,248 spiders and scorpion species, 1,03,248 arachnoid species and 47,000 crustacean species representing about 80% of total known animal species.



Examples of Arthropoda: (a) Locust, (b) Butterfly, (c) Scorpion, (d) Prawn

Some important general features of phylum Arthropoda are discussed below:

- Habitat and Habit They may be aquatic or terrestrial. They may occur as free-living or parasitic forms e.g., Bed bugs, ticks, mosquitoes, etc.
- Body Parts Body is segmented externally. It has distinct head, thorax and abdomen. Head bears many fused segments and sense organs.

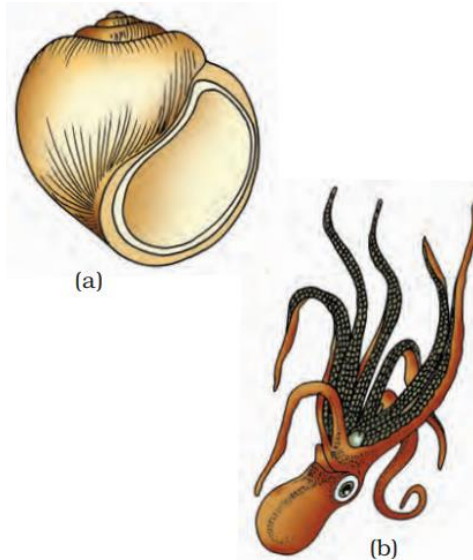
- Symmetry and Body Organization Arthropods are bilaterally symmetrical. They are triploblastic with organ system level of organization.
- Appendages They have jointed, paired appendages, which are present in some or all somite's or segments. These perform various functions like walking, clinging, jumping, feeding, etc.

Phylum Mollusca

The phylum—Mollusca (Molluscs — soft bodied) includes the soft bodied, unsegmented, acoelomate animals. These are called molluscs or shelled animals. Johnston (1650) coined the term 'Mollusca'. Mollusca is the second largest animal phylum and includes about 85,000 species. The study of molluscs is called 'Malacology'.

Some important general features of phylum mollusca are discussed below:

- Habit and Habitat Molluscs are mostly of marine forms (Sepia, Octopus, Chiton, etc.) Some are freshwater (e.g., Unio and Pila) and some are also terrestrial forms (e.g., Land snails). Few molluscs are parasites also, e.g., Glochidium larva, etc.
- Symmetry These are generally bilaterally symmetrical and some are asymmetrical due to torsion or twisting during growth.
- Germ Layers and Organization They are triploblastic and possess organ system level of organization.
- Body Form They have unsegmented, soft body covered by a calcareous shell, which is differentiated into head, muscular foot and visceral hump.



Examples of Mollusca :
(a) Pila (b) Octopus

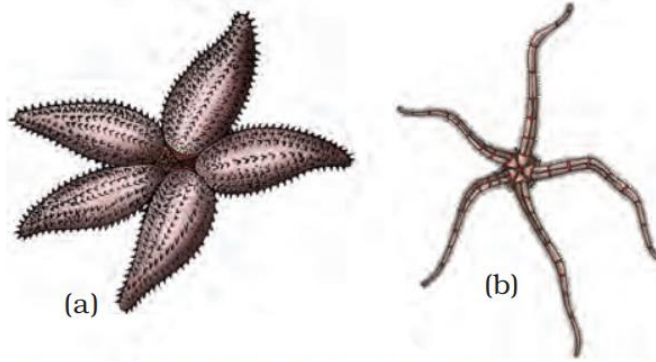
Phylum Echinodermata

Phylum—Echinodermata (Echinos—spines; derma—skin) includes the spiny skinned animals, which are exclusively marine. Jacob Klein (1734) coined the term 'Echinodermata'. It includes about 6,000 species.

Some important general features of phylum—Echinodermata are discussed below:

- Habit and Habitat These are marine forms and are bottom dwellers.
- Symmetry The adults have radial (pentamerous) symmetry but, the larval forms have bilateral symmetry.

- Germ Layers and Organization They are triploblastic and exhibit organ system grade of organization.
- Head It is absent in echinoderm and body also lacks segmentation.



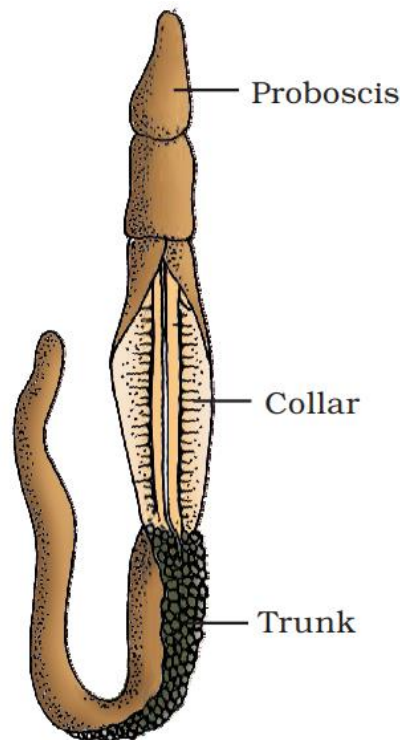
Examples of Echinodermata: (a) Asterias (b) Ophiura

Phylum Hemichordate

Hemichordate (Hemi – half; chordate- notochord) was earlier placed as a sub-phylum under Phylum-Chordata. But, now it is considered as a separate phylum under Non-chordate. These are also called half chordates. This phylum consists of a small group of worm-like animal.

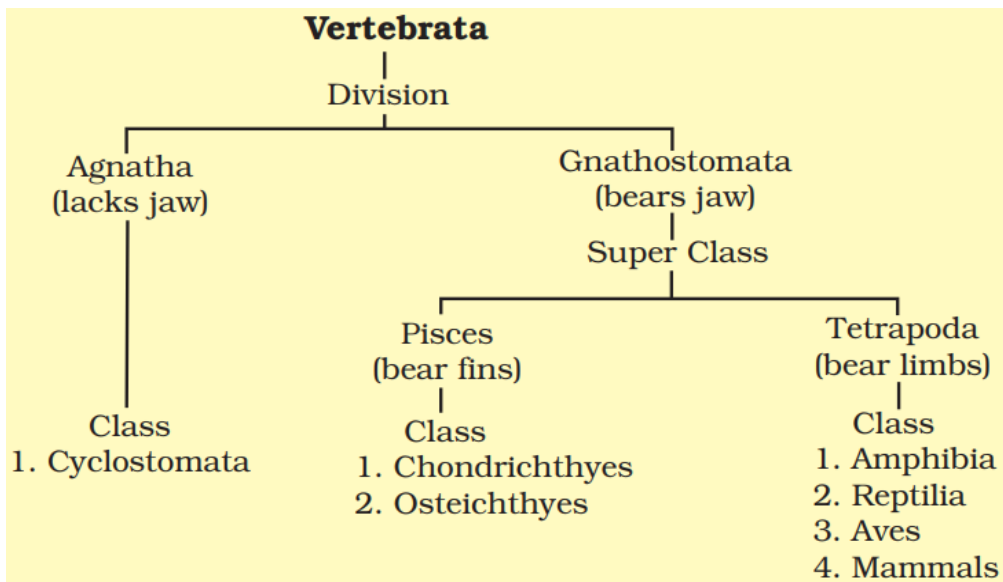
Some important general features of phylum—hemichordate are discussed below:

- Habit and Habitat They are exclusive marine and mostly live in burrows.
- Symmetry and Body Organization They are bilaterally symmetrical and triploblastic. They have organ system level of organization.
- Body Form They are soft-bodied, cylindrical and unsegmented body is divisible into proboscis, collar and trunk. The body cavity is true coelom. A true notochord is absent.
- Digestive Systems Digestive system is complete.



Balanoglossus

The subphylum Vertebrata is further divided as follows:



Class Cyclostomata

- Cyclostomata are ectoparasites on some fishes.
- Elongated body & The presence of 6-15 pairs gills sites.
- Cyclostomes have a sucking and circular mouth without jaws.
- Scales on body and paired fins.
- Circulation is of closed type.
- They are marine but migrate for spawning to fresh water.

Examples: Petromyzon (Lamprey) and Myxine (Hagfish).

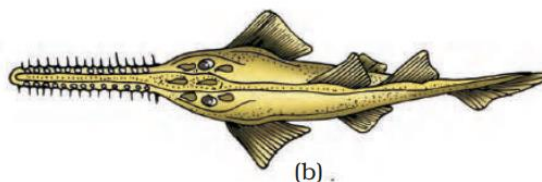
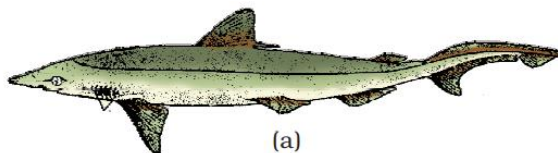


A jawless vertebrate - Petromyzon

Class – Chondrichthyes

- Marine and streamlined body endoskeleton is cartilaginous.
- The skin is tough ventrally mouth gills are separated.
- Heart is two-chambered one auricle and one ventricle.
- They are Cold blooded, Sexes are separate & having internal fertilization many of them are viviparous.

Examples: Scoliodon (Dog fish), Pristis (Saw fish), Carcharodon (Great white shark), Trygon (Sting ray).

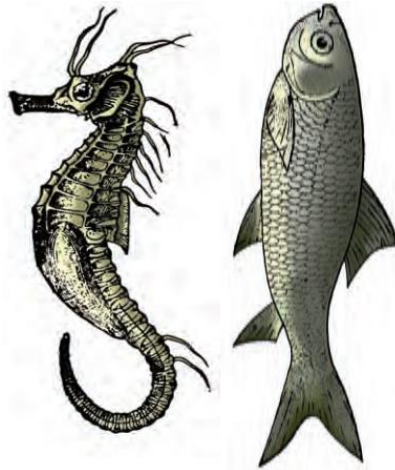


Example of Cartilaginous fishes:
(a) Scoliodon (b) Pristis

Class – Osteichthyes

- Both marine and fresh water fishes with bony endoskeleton.
- Body is streamlined, terminal mouth, four pair of gills.
- Skin is covered with cycloid scales.
- Heart is two-chambered one auricle and one ventricle.
- cold-blooded animals, Sexes are separate, having external fertilization & mostly oviparous and development is direct.

Examples: Marine – Exocoetus (Flying fish), Hippocampus (Sea horse); Freshwater – Labeo (Rohu), Catla (Katla), Clarias (Magur); Aquarium – Betta (Fighting fish), Pterophyllum (Angel fish).

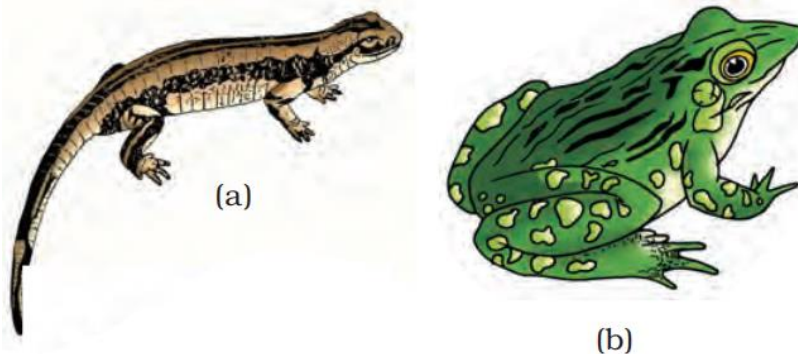


(a) (b)
Examples of Bony fishes :
(a) Hippocampus (b) Catla

Class – Amphibia

- They can live in aquatic and terrestrial habitats, two pair of limbs.
- Body divide into head and trunk, tail may be present in some, skin is moist without scales, A tympanum represents the ear.
- Alimentary canal, urinary and reproductive tracts open into a common chamber called cloaca.
- Respiration by gills, lungs and through skin, heart is three chambered two auricles and one ventricle.
- Cold blooded, Sexes are separate, fertilization is external oviparous and development is indirect.

Examples: Bufo (Toad), Rana (Frog), Hyla (Tree frog), Salamandra (Salamander), Ichthyophis (Limbless amphibia).



Examples of Amphibia: (a) Salamandra (b) Rana

Class – Reptilia

- The mode of locomotion is creeping or crawling terrestrial animals body is covered by dry skin, epidermal scales or scutes.
- Do not have external ear openings Tympanum represents ear, Limbs when present is two paired, heart is three chambered but four chambered in crocodiles.
- Snakes and lizard's scales on skin, Sexes are separate. Fertilization is internal oviparous and development is direct.

Examples: Chelone (Turtle), Testudo (Tortoise), Chameleon (Tree lizard), Calotes (Garden lizard), Crocodilus (Crocodile), Alligator (Alligator). Hemidactylus (Wall lizard), Poisonous snakes – Naja (Cobra), Bangarus (Krait), Vipera (Viper).

Class – Aves

- Aves (birds) are the presence of feathers, They possess beak forelimbs are modified into wings, hind limbs have scales and are modified for walking, swimming or claspings.
- Endoskeleton is fully ossified (bony) and the long bones are hollow with air cavities (pneumatic). digestive tract of birds has additional chambers crop and gizzard.
- Heart is four chambered, warm-blooded respiration by lungs Sexes are separate. Fertilization is internal. They are oviparous and development is direct.

Examples: Corvus (Crow), Columba (Pigeon), Psittacula (Parrot), Struthio (Ostrich), Pavo (Peacock), Aptenodytes (Penguin), Neophron (Vulture).

Class – Mammalia

- Presence of mammary glands milk producing glands by which young ones is nourished, two pairs of limbs, Skin is hairy, External ears or pinnae are present, Heart is four chambered, They are homoiothermous.
- Respiration is by lungs, Sexes are separate and fertilization is internal. They are viviparous with few exceptions and development is direct.
- Examples: Oviparous-Ornithorhynchus (Platypus); Viviparous - Macropus (Kangaroo), Pteropus (Flying fox), Camelus (Camel), Macaca (Monkey), Rattus (Rat), Canis (Dog), Felis (Cat), Elephas (Elephant), Equus (Horse), Delphinus (Common dolphin), Balaenoptera (Blue whale), Panthera tigris (Tiger), Panthera leo (Lion).

NCERT LINE BY LINE QUESTIONS

BASIS OF CLASSIFICATION

1. Which of the following is a basic feature of all the organisms of Animalia? **[Pg-46,E]**
- Multicellular structure
 - Sensory and neuromotor system
 - Terrestrial habitat
 - Locomotion

2. Which of the following lack tissue grade organization? **[Pg-46,E]**
- Metazoans
 - Eumetazoans
 - Parazoans
 - None of these

3. Match the columns. **[Pg-46,47,M]**

	Column-I		Column-II
(A)	Organ level	(1)	Pheretima
(B)	Cellular aggregate level	(2)	Fasciola
(C)	Tissue level	(3)	Spongilla
(D)	Organ system level	(4)	Obelia

Codes-

(A) (B) (C) (D)

- A) 2 4 3 1
 B) 2 3 4 1
 C) 4 1 2 3

D) If both assertion and reason are false.

4. Choose the correct option **[Pg-47,H]**
- Ctenophores and Platyhelminthes possess complete digestive system.
 - Aschelminthes to chordates, all possess organ system level of organization along with complete digestive system.
 - Coelenterates and Aschelminthes possess organ system level of organization along with complete digestive system.
 - Poriferans may possess complete digestive system.
5. The entry of food and exit of waste takes place from separate openings in **[Pg-47,M]**
- organisms having incomplete digestive system
 - coelenterates, ctenophores and Platyhelminthes
 - organisms having complete digestive system
 - organisms having cellular level of organization
6. Which of the following is incorrect? **[Pg47,M]**
- Some division of labour (activities) occur among the cells in the members of phylum porifera.
 - Division of labour (activities) is completely absent among the cells in poriferans.
 - Open circulatory system is found in Tunicates, hemichordates, and noncephalopod

molluscs.

(d.) All of these

7. Choose the incorrect option.

[Pg-47,M]

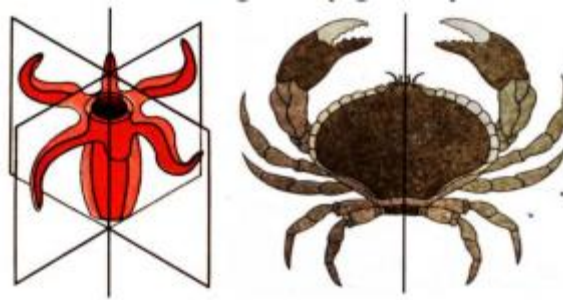
(a.) Complete digestive system - Two openings, mouth and anus

(b.) Incomplete digestive system - Single opening system

(c.) Open circulatory system - Blood is circulated through tubes

(d.) Closed circulatory system - Arteries veins and capillaries present

8. Choose the correct body symmetry shown in the diagram.



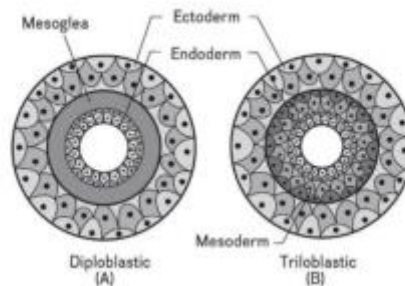
(a.) A – Radial, B – Bilateral

(b.) A – Bilateral, B – Pentamerous

(c.) A – Radial, B – Pentamerous

(d.) A – Bilateral, B – Radial

9. The diagram below shows the diploblastic and triploblastic germ layers in the animals. Identify the correct option in which they are found.



(a.) A – Radial, B – Bilateral

(b.) A – Bilateral, B – Pentamerous

(c.) A – Radial, B – Pentamerous

(d.) A – Bilateral, B – Radial

10. Choose the true statement:

[Pg-47,M]

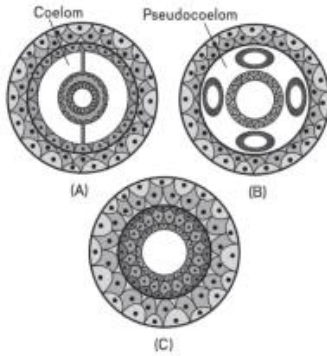
(a.) Animals like annelids, arthropods, Aschelminthes, molluscs, hemichordates and chordates possess bilateral symmetry.

(b.) Most of the animals possess bilateral symmetry.

(c.) Platyhelminthes was the first phylum during evolution to exhibit bilateral symmetry.

(d.) All of these

11. Study the types of animals with respect to the presence or absence of body cavities:



[Pg-47,M]

- (a.) A – Molluscs, B – Chordates
- (b.) A – Annelida, B – Porifera
- (c.) A – Coelenterates, B – Platyhelminthes
- (d.) A – Molluscs, B – Porifera

12. Which of the following option is wrong?

[Pg-47,M]

- (a.) Coelenterates and ctenophores are diploblastic.
- (b.) Animals from Platyhelminthes to chordates are triploblastic.
- (c.) Radially symmetric animals remain attached to a surface by their aboral surface.
- (d.) Mesoglea is an undifferentiated layer which do not form any tissue or organ.

13. Choose the incorrect match

[Pg-47,M]

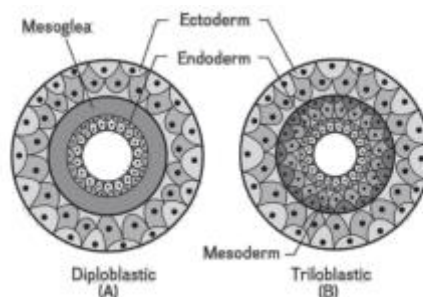
- (a.) Tube-within-tube body plan: Nematelminthes, Annelida, Arthropoda, Mollusca, Echinodermata, Chordata
- (b.) Cell-aggregate type body plan: Coelenterates
- (c.) Blind-sac type body plan: Platyhelminthes and coelenterates
- (d.) None of these

14. Which of the following is/are the function of coelom?

[Pg-48,H]

- (a.) Absorb shock or provide hydrostatic skeleton
- (b.) Support shock or provide hydrostatic skeleton
- (c.) Allow muscles to grow independently of the body wall
- (d.) All of these

15. The diagram below shows the diploblastic and triploblastic germ layers in the animals. Identify the correct option in which they are found.



- (a.) A – Molluscs, B – Chordates
- (b.) A – Annelida, B – Porifera
- (c.) A – Coelenterates, B – Platyhelminthes
- (d.) Molluscs, B – Porifera

16. Choose the incorrect option [Pg-48,H]

- (a.) True coelom is a body cavity which arises as a cavity in the embryonic mesoderm.

- (b.) Digestive cavity is found in acoelomates, pseudocoelomates as well as coelomates.
- (c.) The body cavity of arthropods and non- cephalopod molluscs is called hoemocoel.
- (d.) There is no cavity between the body wall and gut wall in echinoderms.

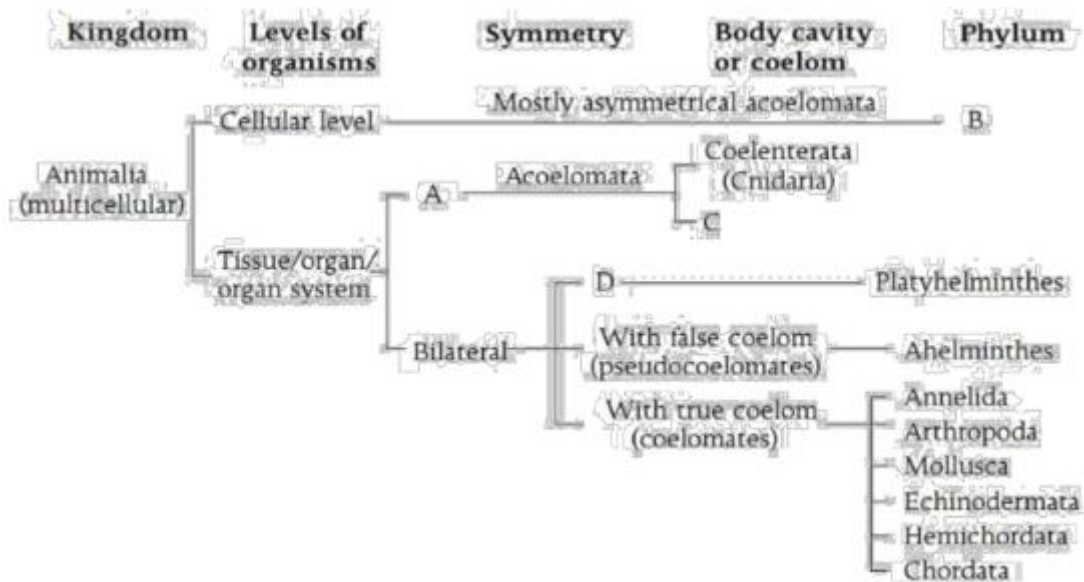
17. Metamerism is present in **[Pg-47,M]**

- (a.) annelids
- (b.) arthropods
- (c.) chordates
- (d.) all of these

18. Choose the incorrect match: **[Pg-47,M]**

- (a.) Coelenterates – Radial symmetry
- (b.) Molluscs – Radial symmetry in adults
- (c.) Platyhelminthes – Triploblastic
- (d.) Ctenophores – Triploblastic

19. Choose the correct label for A, B, C and D in the broad Classification of Kingdom Animalia based on common fundamental features as given below.



	A	B	C	D
A)	Bilateral	Porifera	Ctenophora	Coelomate
B)	Radial	Porifera	Ctenophora	Acoelomate
C)	Bilateral	Porifera	Ctenophora	Coelomate
D)	Radial	Ctenophora	Porifera	Acoelomate

20. Choose the incorrect statement.

- (I) Notochord is ectodermally derived rod-like structure.

- (II) Notochord is formed on the dorsal side during embryonic development.
 (III) The animals from porifera to Echinoderms are without notochord.
 (IV) In some chordates, notochord is replaced by the vertebral column and these chordates are called vertebrates. [Pg-48,M]
 (a.) I and II (b.) I, II, and III
 (c.) II, III and IV (d.) I only

21. Identify the correct labels A and B.

Notochord	Nerve Cord
A	Part of nervous system
Found in chordates only	Found in chordates as well as non-chordates
Dorsal side in chordates	B

- A) A= Exoskeleton, B= Dorsal in chordates as well as in non-chordates
 B) A= Endoskeleton; B= Ventral in chordates as well as in non-chordates
 C) A= Exoskeleton; B= Ventral in chordates and dorsal in nonchordates
 D) A= Endoskeleton; B= Dorsal in chordates and ventral in nonchordates

22. True coelom appear in which of the following during evolution? **[Pg-48,E]**
 (a.) Echinodermata (b.) Annelida
 (c.) Platyhelminthes (d.) Aschelminthes
23. The layer absent in the embryos of diploblastic animals is **[Pg-47,E]**
 (a.) ectoderm (b.) endoderm (c.) mesoderm (d.) mesoglea
24. Nerve cells and tissue level of organization first appeared in **[Pg-46,E]**
 (a.) coelenterates (b.) ctenophora (c.) chordate (d.) porifera
25. In some animal groups, the body is found divided into compartments with at least some organs. This characteristic feature is called **[Pg-48,E]**
 (a.) segmentation (b.) metamerism (c.) metagenesis (d.) metamorphosis
26. Body cavity is the cavity present between body wall and gut wall. In some animals the body cavity is not lined by mesoderm. Such animals are called **[Pg-48,E]**
 (a.) acoelomate (b.) pseudocoelomate
 (c.) coelomate (d.) haemocoelomate
27. Match the following Columns

	Column-I (Phylum)	Column-II (Characteristic Features)
(A)	Porifera	(1) Canal system
(B)	Aschelminthes	(2) Water vascular system
(C)	Annelida	(3) Muscular pharynx
(D)	Arthropoda	(4) Joined appendages
(E)	Echinodermata	(5) Metameres

Select the correct option

- | | (A) | (B) | (C) | (D) | (E) |
|----|-----|-----|-----|-----|-----|
| A) | 1 | 3 | 5 | 4 | 2 |
| B) | 1 | 2 | 3 | 4 | 5 |
| C) | 5 | 4 | 3 | 2 | 1 |
| D) | 4 | 3 | 1 | 2 | 5 |

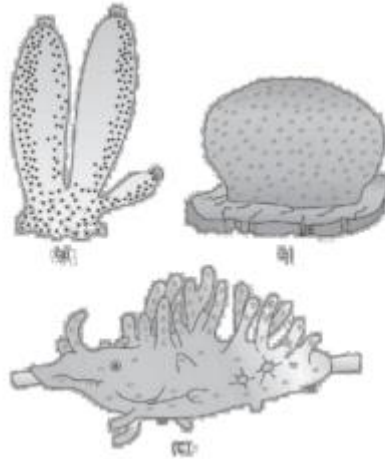
28. Which of the following animals are true coelomates with bilateral symmetry? **[Pg47,E]**
(a.) Adult echinoderms (b.) Aschelminthes
(c.) Platyhelminthes (d.) Annelids
29. Assertion: The primary character of chordates is the presence of dorsal hollow nerve cord. **[Pg-48,H]**
Reason: Vertebral column is derived from the notochord.
(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
(c.) Assertion is true, but Reason is false.
(d.) Assertion is false, but Reason is true.
30. Assertion: Animals with radial symmetry has more advantage in detecting food and danger. Reason: It allows animal to be able to respond to stimulus from any direction. **[Pg-47,H]**
(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
(c.) Assertion is true, but Reason is false.
(d.) Assertion is false, but Reason is true.
31. Assertion: Aschelminthes represent pseudocoelomates. Reason: In aschelminthes, mesoderm is present as scattered pouches in between ectoderm and endoderm. **[Pg-48,H]**
(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
(c.) Assertion is true, but Reason is false.
(d.) Assertion is false, but Reason is true.

PORIFERA

32. Sponges are **[Pg-49,E]**
(a.) with water canal system (b.) sexually reproducing by formation of gametes
(c.) both (a) and (b) (d.) sessile or free-swimming
33. In case of poriferans, the spongocoel is lined with flagellated cells called **[Pg49,E]**
(a.) ostia (b.) oscula (c.) choanocytes (d.) mesenchymal cells
34. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum **[Pg49,E]**
(a.) coelenterate (b.) porifera (c.) Mollusca (d.) protozoa
35. In most simple type of canal system of porifera, water flows through which one of the following ways? **[Pg-49,M]**
(a.) Ostia → Spongocoel → Osculum → Exterior

- (b.) Spongocoel → Ostia → Osculum → Exterior
- (c.) Osculum → Spongocoel → Ostia → Exterior
- (d.) Osculum → Ostia → Spongocoel → Exterior

36. Examine the figures A, B, and C.



In which one of the four options all the animals (Poriferans) are correct?

- (a.) A - Sycon, B - Euspongia, C - Spongilla
 - (b.) A - Euspongia, B - Spongilla, C - Sycon
 - (c.) A - Spongilla, B - Sycon, C - Euspongia
 - (d.) A - Euspongia, B - Sycon, C - Spongilla
37. Which of the following is a freshwater sponge? **[Pg-50,E]**
- (a.) Euspongia
 - (b.) Euplectella
 - (c.) Spongilla
 - (d.) Sycon
38. In poriferans, the rudimentary division of labour is found between the **[Pg-49,E]**
- (a.) tissue
 - (b.) cells
 - (c.) organs
 - (d.) organ-system
39. Which of the following is not a characteristic of class Porifera? **[Pg49,M]**
- (I) Development is indirect (larval stage is present).
 - (II) Mostly asymmetrical and usually marine
 - (III) Primitive multicellular animals with cellular level of organization.
 - (IV) Choanocytes line the spongocoel and the canals. (V) Sexes are separate
- (a.) I and IV
 - (b.) II only
 - (c.) V only
 - (d.) III and IV
40. Choose the correct characteristic for sponges. **[Pg-49,M]**
- (a.) They are highly regenerative
 - (b.) They are universally radially symmetrical
 - (c.) They contain calcareous spicules but lack the siliceous one
 - (d.) They are found only in fresh water

COELENTERATA

41. Cnidocytes are **[Pg-50,H]**
- (a.) also called cnidoblast or nematocyte
 - (b.) explosive cells each of which contain giant secretory organelle called nematocyst
 - (c.) stinging cells
 - (d.) with all the above features
42. Consider the following statements about cnidarians: **[Pg-50,H]**
- (I) They have tissue level of organization and triploblastic.
 - (II) Digestion is extracellular and intracellular.
 - (III) Corals secrete calcium bicarbonate form a skeleton.

(IV) Corals may harbour some photosynthetic dinoflagellates for taking nutrition.
 (V) They possess a central gastrovascular cavity with a single opening mouth in hypostome.

- (a.) Statements I and III are correct
- (b.) Statements II, IV and V are correct
- (c.) Statements I, II and III are correct
- (d.) Statements III and IV are incorrect

43. Here two basic body forms of cnidarians are given.



- (a.) A and B are false swimming forms
- (b.) A and B are sessile form
- (c.) A produce B asexually and B form the 'A' sexually
- (d.) B produce A sexually and A form the 'B' sexually

44. Match the columns.

	Column-I		Column-II
(A)	Gorgonia	(1)	Sea fan
(B)	Adamsia	(2)	Sea pen
(C)	Physalia	(3)	Portuguese man of war
(D)	Pennatula	(4)	Sea anemone

Select the correct option

- (A) 1 3 4 2
- (B) 1 2 3 4
- (C) 4 3 2 1
- (D) 3 4 1 2

45. 'Stinging capsules' or nematocytes are found in

[Pg-50,E]

- (a.) sea anemone (b.) sea pen (c.) sea fan (d.) all of these

46. Assertion: Choanocytes or collar cells line the spongocoel and the canals in poriferans.

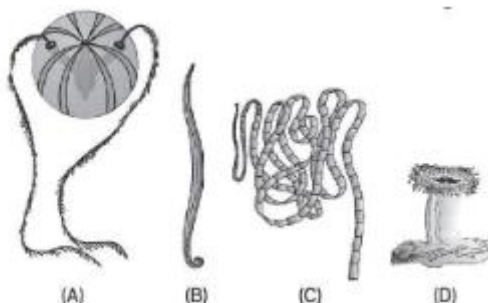
Reason: Poriferans possess spicules or spongin fibers. [Pg-49,H]

- (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
- (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
- (c.) Assertion is true, but Reason is false.
- (d.) Assertion is false, but Reason is true.

CTENOPHORA

[Pg-51,E]

47. Ctenophores
 (a.) perform external fertilization
 (b.) have indirect development
 (c.) both (a) and (b)
 (d.) have separate sexes
48. Identify the correct option specifying the names of the animals A, B, C and D.



	(A)	(B)	(C)	(D)
A)	Pleurobranchia	Tapeworm	Taenia	Aurelia
B)	Fasciola	Tapeworm	Liver fluke	Aurelia
C)	Pleurobranchia	Roundworm	Taenia	Adamsia
D)	Fasciola	Roundworm	Liver fluke	Adamsia

PLATYHELMINTHES

49. In tapeworms [Pg-51,M]
 (a.) flame cells are absent
 (b.) both exoskeleton and endoskeleton present
 (c.) hooks and suckers present
 (d.) body is radially symmetrical
50. Which of the following is not a Platyhelminthes [Pg-51,E]
 (a.) Wuchereria (b.) Taenia (c.) Fasciola (d.) Planaria
51. Ascaris is characterized by [Pg-52,M]
 (a.) the absence of true coelom but presence of metamerism
 (b.) the presence of neither true coelom nor metamerism
 (c.) the presence of true coelom but the absence of metamerism
 (d.) the presence of true coelom and metamerism
52. Which of the option is correct for the statements given below. [Pg-51,E]
 (I) Commonly called sea walnuts or comb jellies.
 (II) Bioluminescence is well marked.
 (III) Body bear eight external rows of ciliated comb plates. (IV) They have flame cells for osmoregulation and excretion.
 (V) Alimentary canal is complete with a well-developed muscular pharynx.

	Ctenophores	Platyhelminthes	Aschelminthes
A)	I, II, III	IV	V
B)	IV	I, II	III, V
C)	I, II	III, IV	V
D)	IV, V	II, III	I

53. Phylum Platyhelminthes members are **[Pg-51,M]**
 (a.) dorsoventrally flattened, thus called flatworms
 (b.) bilaterally symmetrical, triploblastic and acoelomates
 (c.) with organ system level of organization
 (d.) with all the above features
54. Assertion: Taenia Solium and Dugesia belong to Platyhelminthes. **[Pg-51,H]**
 Reason: Platyhelminthes are coelomates.
 (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 (c.) Assertion is true, but Reason is false.
 (d.) Assertion is false, but Reason is true.
55. Assertion: The organisms of Platyhelminthes are usually hermaphrodite. Reason: These organisms possess internal as well as external fertilization. **[Pg-51,H]**
 (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 (c.) Assertion is true, but Reason is false.
 (d.) Assertion is false, but Reason is true.

ASCHELMINTHES

56. Consider the following statements about aschelminthes: **[Pg-52,E]**
 (I) Their body is circular in crosssection, so are called round worms.
 (II) Alimentary canal is incomplete
 (III) Muscular pharynx is present
 (IV) They are hermaphrodites Which of the following is correct?
 (a.) I and III (b.) II and IV
 (c.) I, II and IV (d.) IV only
57. Choose the incorrect option. **[Pg50,51,52,M]**
 (a.) Mesoglea is present in between ectoderm and endoderm in Obelia.
 (b.) Asterias exhibits radial symmetry.
 (c.) Fasciola is pseudocoelomate animal.
 (d.) Taenia is a triploblastic animal
58. Out of the given cells, which of them can differentiate and perform different functions?
 [Pg-52,M]
 (a.) Choanocytes (b.) Interstitial cells
 (c.) Gastrodermal cells (d.) Nematocysts
59. Blood sucking leech is **[Pg-52,E]**
 (a.) Nereis (b.) Hirudinaria (c.) Pheretima (d.) All of these
60. Which one of the following endoparasites of humans does show viviparity? **[Pg52,E]**
 (a.) Ancylostoma duodenale (b.) Enterobius spiralis
 (c.) Trichinella spiralis (d.) Ascaris lumbricoides
61. Assertion: Aschelminthes and Annelids possess bilateral symmetry. **[Pg-52,M]**
 Reason: Both Aschelminthes and Annelids are coelomates.
 (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

- (c.) Assertion is true, but Reason is false.
 (d.) Assertion is false, but Reason is true.

ANNELIDA

62. Which of the following animals are true coelomates with bilateral symmetry? [Pg52,E]
 (a.) Adult echinoderms (b.) Aschelminthes
 (c.) Platyhelminthes (d.) Annelids
63. The name 'Annelida' is given to animal phylum having [Pg-52,E]
 (a.) parapodia (b.) metameric segments
 (c.) nephridia (d.) all of these
64. In Annelids [Pg-52,M]
 (a.) neural system consists of paired ganglia connected by lateral nerves to a double ventral nerve cord
 (b.) reproduction occur both asexually and sexually
 (c.) like Nereis, Pheretima and Hirudinaria have monoecious condition
 (d.) Aquatic forms are completely absent.
65. Match the columns

	Column-I		Column-II
(A)	Gills	(1)	King crab
(B)	Tracheal system	(2)	Crab, prawn
(C)	Book gills	(3)	Butterfly, cockroach
(D)	Book lungs	(4)	Scorpion, spider

(A) (B) (C) (D)

- A) 1 2 3 4
 B) 2 3 1 4
 C) 4 3 2 1
 D) 3 1 4 2
66. Choose the incorrect statement.
 (a.) In cockroaches and prawns, excretion of waste material occurs through malphigian tubules. [Pg55,M]
 (b.) In ctenophores, locomotion is mediated by comb plates. [Pg-51]
 (c.) In fasciola, flame cells take part in excretion. [Pg-51]
 (d.) Earthworms are hermaphrodites and yet cross fertilization takes place among them. [Pg-52]
67. Consider the following statements: [Pg52,M]
 (I) Triploblastic, bilateral symmetry
 (II) Metamerically segmental and coelomate animals
 (III) Dioecious
 (IV) Closed circulatory system
 (V) Lateral appendages

(VI) Annelida

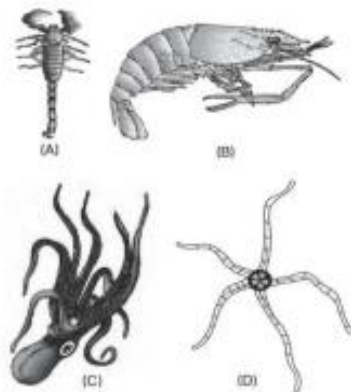


Which of the following information's belongs to the given animal.

- (a.) I, II, IV, VI (b.) I, III, IV, V (c.) II, III, IV, V (d.) III, IV, V, VI

ARTHROPODA

68. Choose the incorrect set with respect to arthropods. [Pg-53,M]
(a.) Limulus, locusta, culex (b.) Bombyx, Apis, lacifer
(c.) Pinctada, Aplysia, Dentalium (d.) Aedes, Anopheles, Apis
69. Balancing organ of aquatic arthropods is [Pg-53,E]
(a.) Cnidoblasts (b.) choanocytes
(c.) scleroblasts (d.) statocysts
70. Which one of the following features is not present in the phylum-Arthropods? [Pg53,E]
(a.) Metameric segmentation (b.) Parapodia
(c.) Jointed appendages (d.) Chitinous exoskeleton
71. Which one of the following characteristics is mainly responsible for diversification of insects on land? [Pg53,E]
(a.) Segmentation (b.) Bilateral symmetry
(c.) Exoskeleton (d.) Eyes
72. Which of the following statement is correct? [Pg-53,E]
(a.) Insect hemolymph has no role in oxygen transport in most cases.
(b.) Insects hemolymph is mostly colourless.
(c.) Both (a.) and (b.)
(d.) None of these
73. Consider the following statements about Arthropods. [Pg-53,M]



- (I) Open circulatory system is found in most arthropods.
(II) Arthropods contain Haemolymph which directly bathes in internal tissues and organs.
- (a.) I is true but II is false (b.) I is false but II is true
(c.) Both I and II are true (d.) Both I and II are false

74. Moulting [Pg-53,E]
 (a.) is also called ecdysis
 (b.) occurs to shed chitin at regular intervals by many arthropods
 (c.) is the shedding of cuticle in many invertebrates
 (d.) all of these
75. Maggot is the larva of [Pg-53,E]
 (a.) housefly (b.) crab (c.) moth (d.) butterfly

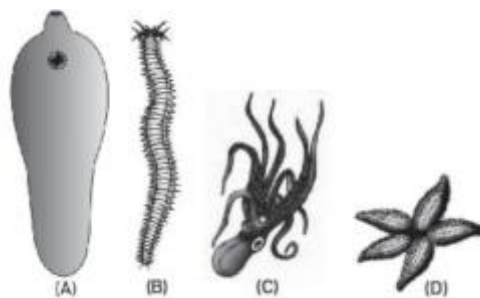
MOLLUSCA

76. Choose the incorrect statement for phylum Mollusca. [Pg-53,H]
 (a.) Body is covered by a calcareous shell and unsegmented.
 (b.) Feather like gills present for excretion and respiration.
 (c.) The anterior head region has sensory tentacles.
 (d.) Mostly terrestrial, triploblastic and acoelomates.
77. Choose the correct names for the following.

	A	B	C	D
(a)	Scorpion	Prawn	Loligo	Asterias
(b)	Scorpion	Prawn	Octopus	Ophiura
(c)	Locust	Butterfly	Loligo	Asterias
(d)	Locust	Prawn	Squid	Ophiura

78. **Assertion:** In many gastropods, the arms and the mental cavity are placed anteriorly above the head. **Reason:** During embryonic development in many gastropods, one side of the visceral mass grows faster than the other side. This uneven growth rotates the visceral organs up to 180° in many gastropods. [Pg-53,H]
 (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 (c.) Assertion is true, but Reason is false.
 (d.) Assertion is false, but Reason is true.
79. Assertion: In molluscs, feathers like gills are present in the mantle cavity. Reason: These gills have respiration and excretory function. [Pg-53,H]
 (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 (c.) Assertion is true, but Reason is false.
 (d.) Assertion is false, but Reason is true.
80. Which of the following statements represents the incorrect feature of Echinodermata? [Pg-54,M]
 (a.) They are triploblastic and coelomate animals.
 (b.) All are marine with cellular level of organization.
 (c.) Endoskeleton of calcareous ossicle.
 (d.) None of these

81. Which of the following is the feature of water vascular system in Echinoderms? [Pg-54,E]
 (a.) Locomotion (b.) Respiration
 (c.) Capture and transport of food (d.) All of these
82. Choose the correct statement for star fish. [Pg-54,M] (I) Sexes are separate and reproduction is sexual (II) Development is indirect with freeswimming larva (III) Mouth is present on the upper (dorsal) side and anus on the lower (ventral) side. (IV) Their body bear jaw-like structure which is called oral arms.
 (a.) I and III (b.) I, II and IV
 (c.) I, II and III (d.) III and IV
83. Which one for the following animals does not undergo metamorphosis? [Pg-54,E]
 (a.) Moth (b.) Tunicate
 (c.) Earthworm (d.) Starfish
84. Choose the correct statement for the following animals.



- (a.) All the animals are aquatic, free living
 (b.) All are true coelomates
 (c.) 'A' has radial symmetry but remaining have bilateral symmetry
 (d.) 'A' is monoecious but remaining are dioecious
85. Which of the following is incorrect statement for Hemichordata? [Pg-54,M]
 (a.) They are bilaterally symmetrical, triploblastic and coelomate.
 (b.) Circulation is of open type.
 (c.) Sexes are separate, fertilization is external and development is indirect.
 (d.) None of these
86. Select the feature which is/are not present in Hemichordates. [Pg-54,E]
 (a.) Stomochord
 (b.) Worm-like body
 (c.) Gills
 (d.) All of these
87. The correct classification of given animal is [Pg-54,E]
 (a.) Chordata – Vertebrata – Craniata
 (b.) Chordata – Craniata
 (c.) Chordata – Acraniata
 (d.) Non- chordata – Hemichordata
88. The body of Balanoglossus is divisible into [Pg-54,E]
 (a.) proboscis, tunic and trunk
 (b.) collar, trunk and tunic

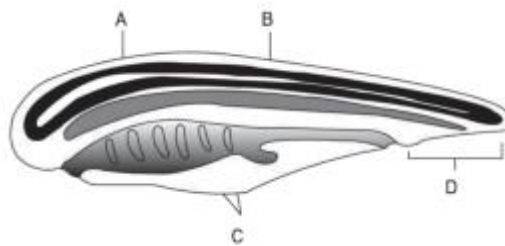
- (c.) proboscis, collar and trunk
- (d.) proboscis, stomochord and trunk

89. An important characteristics that hemichordates share with chordates is [Pg-54,E]
- (a.) absence of notochord
 - (b.) ventral tubular nerve cord
 - (c.) pharynx with gill slits
 - (d.) pharynx without gill slits

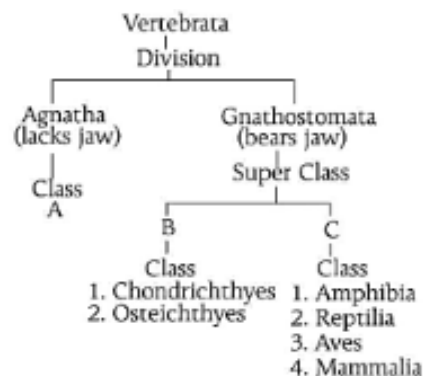
CHORDATA

90. Which of the following is not found in the phylum chordate [Pg-55,M]
- (a.) A dorsal hollow nerve chord
 - (b.) Lateral paired gill slits during development
 - (c.) A notochord at some stage of development
 - (d.) An external skeleton

91. Animals belonging to phylum-chordata are fundamentally characterized by the presence of structure noted as A, B, C and D. Identify A, B, C and D.



- (a.) A - Notochord, B - Nerve cord, C - Gill slits, D - post anal part
 - (b.) A - Nerve cord, B - Notochord, C - Gill slits, D - Post anal part
 - (c.) A - Nerve cord, B - Notochord, C - Post anal part, D - Gill Slits
 - (d.) A - nerve cord, B - Gill slits, C - Notochord, D - post anal part
92. Choose the incorrect vertebrate character. [Pg-55,E]
- (a.) Ventral muscular heart
 - (b.) Kidneys for excretion and osmoregulation
 - (c.) Paired appendages which may be fins or limbs
 - (d.) None of these
93. The following flow chart for division of sub phylum vertebrata fill in the parts A, B, C and D and choose the correct option.



	A	B	C
A)	Ostracodermi	Pisces	Tetrapoda
B)	Cyclostomata	Pisces	Tetrapoda
C)	Ostracodermi	Cyclostomata	Pisces
D)	Pisces	Tetrapoda	Cyclostomata

94. Select the correct difference between the notochord in the following:

	Urochordata	Cephalochordata
A)	Present only in larval tail	Extend from head to tail throughout life
B)	present only in adult	Present only in larval tail
C)	Persistent throughout their life	Present only in adult
D)	Extend from head to tail throughout life	Present only in larval tail

95. Consider the following statements. [Pg56,M]

(I) Lancelets are jawless, primitive fishlike vertebrates.

(II) In lancelets notochord, tubular nerve cord and pharyngeal gills slits are present throughout their life.

- (a.) I is true, but II is false
- (b.) I is false, but II is true
- (c.) Both I and II are true
- (d.) Both I and II are false

96. Which of the following represents the correct combination without any exception?

	Characteristic	Class
A)	Mammary gland; hair on body; pinnae; two pairs of limbs	Mammalia
B)	Mouth ventral; gills without operculum skin with placoid scales; persistent notochord	Chondrichthyes
C)	Sucking and circular mouth, jaws absent integument	Cyclostomata

	without scales; paired appendages	
D)	Body covered with feathers; skin moist and glandular; lungs with air sacs forelimbs from wings	Aves

97. Among the following edible fishes, which one is a marine fish having rich source of omega-3 fatty acids? [Pg-57,E]
 (a.) Mystus (b.) Mangur (c.) Mrigala (d.) Mackerel
98. Which one is not cartilaginous fish? [Pg57,E]
 (a.) Carcharodon (great white shark), Trygon (sting ray)
 (b.) Exocoetus (flying fish), catla (katla), clarias (Mangur)
 (c.) Scolidon (dog fish)
 (d.) Pristis (saw fish)
99. Following are few examples of bony fishes. Choose the odd one out as marine bony fish. [Pg-57,E]
 (a.) Flying fish (b.) Hippocampus (sea horse)
 (c.) Both (a) and (b) (d.) Labeo (rohu), catla, clarias
100. Which of the following is not a characteristic of class chondrichthyes? [Pg-56,M]
 (a.) Gill slits are separated and without operculum.
 (b.) Predaceous with powerful jaws.
 (c.) Notochord is persistent throughout life.
 (d.) Airbladder present.
101. Which of the following characteristic features always holds true for the corresponding group of animals? [Pg-56- 59,H]
 (a.) Viviparous Mammalia
 (b.) Possess a mouth with an upper and a lower jaw Chordata
 (c.) Three-chambered heart with one incompletely divided ventricle Reptilia
 (d.) Cartilaginous endoskeleton Chondrichthyes
102. Bony fishes are [Pg-57,E]
 (a.) having external fertilization (b.) mostly oviparous
 (c.) with direct development (d.) all of these
103. Bony fishes stay at any particular depth in water without spending energy due to [Pg-57,E]
 (a.) Operculum (b.) Neuromuscles (c.) Pneumatic bones (d.) Swim bladder
104. Choose the incorrect statement? [Pg56,M]
 (a.) Both cartilaginous and bony fishes are dioecious
 (b.) Cartilaginous fishes show sexual dimorphism
 (c.) Male cartilaginous fish have claspers
 (d.) Female cartilaginous fish have claspers
105. Choose the correct option for the given figures.



- (a.) Animal A is salamandra and B is chameleon.
- (b.) Both A and B belongs to class Reptilia.
- (c.) Fertilization is external in both.
- (d.) Animal A has 2-chambered heart and B has 3-chambered heart.

106. Choose the incorrect option for the following animal.



- (a.) Cloaca present
 - (b.) Dioecious, external fertilization, oviparous, indirect development
 - (c.) Body divisible into head and trunk
 - (d.) Eyes are without eyelids.
107. Which one of these animals is not a homeotherm? [Pg-57,58,E]
- (a.) Camelus (b.) Chelone (c.) Macropus (d.) Psittacula
108. Identify the vertebrate group of animals characterized by crop and gizzard in its digestive system. [Pg-58,E]
- (a.) Aves (b.) Reptilia (c.) Amphibia (d.) Osteichthyes
109. Which among these is the correct combination of aquatic mammals? [Pg56,57,M]
- (a.) Seals, dolphin, sharks (b.) Dolphins, seals, trygon
 - (c.) Whales, dolphins, seals (d.) Trygon, whales, seals
110. Which one of the following characteristic is not shared by birds and mammals? [Pg-58,59,E]
- (a.) Breathing using lungs (b.) Viviparity
 - (c.) Warm-blooded nature (d.) Ossified endoskeleton
111. Which of the following animals is not viviparous? [Pg-59,E]
- (a.) Flying fox (bat) (b.) Elephant
 - (c.) Platypus (d.) Whale
112. Choose the correct option having animals with four chambered heart? [Pg58,59,E]
- (a.) Amphibian, reptiles, birds (b.) Crocodiles, birds, mammals
 - (c.) Lizards, crocodiles, turtles (d.) Lizards, mammals, birds
113. The animal pair with non-glandular skin are [Pg-58,E]
- (a.) snake and frog (b.) crocodile and tiger
 - (c.) frog and pigeon (d.) chameleon and turtle
114. Which of the following characteristic is shared by both birds and mammals? [Pg-58,59,M]

- (a.) Pigmented skin (b.) Pneumatic bones
(c.) Viviparity (d.) Warm-blooded body

115. Which of the following sets of animals belongs to a single Taxonomic group? [Pg-59,E]

- (a.) Man, monkey, chimpanzee
(b.) Cuttlefish, jellyfish, silver fish, dog fish, starfish
(c.) Bat, pigeon, butterfly
(d.) Silkworm, tapeworm, earthworm

116. Match the following columns.

	Column-I		Column-II
(A)	Cyclostomes	(1)	Hemichordata
(B)	Aves	(2)	Urochordata
(C)	Tunicates	(3)	Agnatha
(D)	Balanoglossus	(4)	Pisces
(E)	Osteichthyes	(5)	Tetrapod

Codes

	A	B	C	D	E
A) 1	2	3	4	5	
B) 2	3	4	1	5	
C) 3	5	2	1	4	
D) 3	1	5	2	4	

117. Which of the following is incorrect for Petromyzon? [Pg-56,M]

- (a.) Cranium and vertebral column are cartilaginous
(b.) They are freshwater organisms but migrate for spawning to sea water
(c.) After spawning within few days, they die
(d.) Their larvae, after metamorphosis, return to ocean

118. Match the name of the animal in Column I with one characteristic in Column II and the phylum/class in column III to which it belongs.

	Column-I	Column-II	Column-III
(a)	Petromyzon	Ectoparasite	Cyclostomata
(b)	Ichthyophis	Terrestrial	Reptilia
(c)	Limulus	Body covered by chitinous exoskeleton	Pisces
(d)	Adamsia	Radially symmetrical	Porifera

119. Choose the incorrect subphylum of Phylum Chordata [Pg-55,E]

- (a.) Hemichordata (b.) Vertebrata (c.) Cephalochordata (d.) Urochordata

120. Protochordates [Pg-55,E]
 (a.) include Urochordata and cephalochordate (b.) are exclusively marine
 (c.) have notochord throughout life (d.) All of these
121. Choose the incorrect option for chordates. [Pg-54,E]
 (a.) Paired pharyngeal gill slits (b.) Coelomate diploblastic
 (c.) Post anal tail (d.) Closed circulatory system
122. Choose the correct option for the animals shown below.



- (a.) The organism belongs to cephalochordate and genus Ascidia.
 (b.) Circulatory system is open type.
 (c.) Development is always direct.
 (d.) Fresh water dwelling.
123. The skin of amphibians [Pg-57,E]
 (a.) can be smooth or rough (b.) are usually with Scales
 (c.) possess eutaneous glands (d.) both (a) and (b)
124. In amphibians [Pg-57,E]
 (a.) mole copulatory organs are absent (b.) metamorphosis is usually absent
 (c.) tadpole stage is universally present (d.) cranial nerves are absent
125. Read the following statements. [Pg57,58,H]
 (I) Retention of larval trait is called neoteny.
 (II) The largest amphibian is Cryptobranchus.
 (III) Seymouria is a connecting link between amphibian and reptiles.
 (IV) Larva of Ambystoma is called axolotl.
 (V) Axolotls are amphibians formed without undergoing metamorphosis. Choose the correct statement
 (a.) I and IV (b.) II and III (c.) I, II and III (d.) I, II, III and IV
126. Match the columns.

	Column-I		Column-II
(A)	Chameleon	(1)	Tortoise
(B)	Testudo	(2)	Tree lizard
(C)	Calotes	(3)	Garden lizard
(D)	Chelone	(4)	Turtle

	A	B	C	D
A)	1	2	3	4
B)	4	3	2	1
C)	2	1	3	4
D)	3	1	4	2

127. Choose the incorrect statement for class Reptilia. [Pg-58,M]
 (a.) Sexes are separate.
 (b.) Kidneys are metanephric.
 (c.) Limbs are always present and are two pairs.
 (d.) Possess creeping or crawling mode of locomotion.
128. Birds [Pg-58,E]
 (a.) are poikilotherms
 (b.) have respiration performed only by the air sacs
 (c.) are bipeds
 (d.) endoskeleton is ossified partially
129. Find the incorrect match [Pg-58,59,M]
 (a.) Crow – Corvus
 (b.) Pigeon – Columba
 (c.) Parrot – Psittacula
 (d.) Penguin – Pavo
130. Which of the following is incorrect? [Pg58,M]
 (a.) Aves possess poor olfactory system.
 (b.) Aves are partially homeotherms.
 (c.) Aves bones are hollow with air cavities.
 (d.) Aves have sexes separate, fertilization is internal, oviparous with direct development.
131. Syrinx present in birds [Pg-58,E]
 (a.) helps in producing sound
 (b.) lie near the junction of trachea and bronchi
 (c.) both (a.) and (b.)
 (d.) helps in excretion of urea
132. The most unique mammalia character is [Pg-58,E]
 (a.) the presence of two pairs of limbs
 (b.) reproducing young ones
 (c.) the presence of mammary glands
 (d.) the presence of skin
133. The skin of the mammals is unique in possessing [Pg-59,E]
 (a.) glands
 (b.) epidermal layer
 (c.) hair
 (d.) both (a.) and (c.)
134. Heart is always four chambered in [Pg59,E]
 (a.) mammals
 (b.) aves
 (c.) reptiles
 (d.) both (a) and (b)
135. Choose the correct statements from the following: [Pg-59,M]
 (a.) Mammals, birds, reptiles and amphibians possess 12 pairs of cranial nerves.
 (b.) In aquatic mammalian males, testes lie outside the body cavity in scrotal sacs
 (c.) The neck of mammals generally possess 5 cervical vertebrae
 (d.) Archeopteryx is a fossil animal.

136. Choose the odd one out. [Pg-60,M]

- (a.) Prototheria – Ornithorhynchus
 (c.) Metatheria – Maceaea

- (b.) Marsupilia – Macropus
 (d.) Eutheria – Homo

137. Choose the correct option for A, B, C and D.

Prototherians	Metatherians	Eutherians
A	Viviparous	Viviparous
Nipples absent on mammary glands	B	Nipples present
C	Vagina and uterus present	Vagina and uterus present
Ear is devoid of pinna	Pinna is present	D
Scrotum absent	Scrotum present	Scrotum present

- A) A = Oviparous
 B = Nipples present
 C = Vagina and uterus absent
 D = Pinna is absent in aquatic forms
- B) A = Oviparous
 B = Nipples present
 C = Vagina and uterus absent
 D = Pinna is universally forms
- C) A = Viviparous
 B = Nipples present
 C = Vagina and uterus absent
 D = Pinna is absent in aquatic forms
- D) A = Oviparous
 B = Nipples absent
 C = Vagina and uterus absent
 D = Pinna is present only in aquatic forms.

138. Tetrapods [Pg-57-60]

- (a.) lack paired appendages and pentadactyl limbs
 (b.) universally possess gills
 (c.) possess sense organ functional in air
 (d.) dwell only in terrestrial zones

139. Identify A, B, C and D in the table given below.

Amphibians	Reptiles	Birds	Mammals
Scales usually absent	A	Present on hind limbs	Absent
Cloaca present	Cloaca present	Cloaca absent	B

Erythrocytes oval, biconvex and nucleated	RBC oval, biconvex and nucleated	Erythrocytes oval, biconvex and nucleated	RBC circular biconcave and non-nucleated
Three chambered heart	Three chambered heart	C	Four chambered heart with left systemic arch
External ear absent	External ear may be present	D	External ear with pinna present

- (a.) A = Scales absent B = Cloaca mainly present C = Four chambered heart with left systemic arch D = External ear absent
 (b.) A = Scales present B = Cloaca mainly absent C = Three chambered heart D = External ear absent
 (c.) A = Scales absent B = Cloaca mainly present C = Three chambered heart with right systemic arch D = External ear present
 (d.) A = Scales present B = Cloaca mainly absent C = Four chambered heart with right systemic arch D = External ear present

140. **Assertion:** All vertebrates are chordates.

Reason: Vertebrates possess notochord during embryonic period. [Pg-57,H]

- (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 (c.) Assertion is true, but Reason is false.
 (d.) Assertion is false, but Reason is true.

141. **Assertion:** All metatherians are placental mammals.

Reason: All placental mammals have menstrual cycle. [Pg59,H]

- (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 (c.) Assertion is true, but Reason is false.
 (d.) Assertion is false, but Reason is true.

142. **Assertion:** Duck bill platypus is not a true mammal.

Reason: True mammals are all viviparous while platypus are egg laying. [Pg-59,60,H]

- (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
 (c.) Assertion is true, but Reason is false.
 (d.) Assertion is false, but Reason is true.

143. **Assertion:** Bats and whales are classified as mammals.

Reason: Bats and whales have four chambered heart. [Pg-59,60,H]

- (a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
 (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of

Assertion.

(c.) Assertion is true, but Reason is false.

(d.) Assertion is false, but Reason is true.

144. **Assertion:** Mammalian teeth are heterodont.

Reason: Mammals possess more than a single tooth [Pg-59,H]

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.

(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

(c.) Assertion is true, but Reason is false.

(d.) Assertion is false, but Reason is true.

145. **Assertion:** Reptiles are referred to as poikilotherms.

Reason: Reptiles possess eggs with shells which help them to adapt in land environment.

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.

(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

(c.) Assertion is true, but Reason is false.

(d.) Assertion is false, but Reason is true.

146. **Assertion:** Birds possess moist skin.

Reason: Birds possess oil glands throughout their body.

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.

(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

(c.) Assertion is true, but Reason is false.

(d.) Assertion is false, but Reason is true

NEET PREVIOUS YEARS QUESTIONS

- Which of the following animals does not undergo metamorphosis? **[2018]**
(a) Earthworm (b) Tunicate (c) Starfish (d) Moth
- Which one of these animals is not a homeotherm? **[2018]**
(a) Macropus (b) Chelone (c) Psittacula (d) Camelus
- Identify the vertebrate group of animals characterised by crop and gizzard in its digestive system. **[2018]**
(a) Amphibia (b) Reptilia (c) Osteichthyes (d) Aves
- In case of poriferans, the spongocoel is lined with flagellated cells called _____. **[2017]**
(a) oscula (b) choanocytes (c) mesenchymal cells (d) ostia
- An important characteristic that hemichordates share with chordates is **[2017]**
(a) ventral tubular nerve cord. (b) pharynx with gill slits.
(c) pharynx without gill slits. (d) absence of notochord.
- Which among these is the correct combination of aquatic mammals? **[2017]**
(a) Dolphins, Seals, Trygon (b) Whales, Dolphins, Seals
(c) Trygon, Whales, Seals (d) Seals, Dolphins, Sharks
- Which of the following features is not present in the phylum- arthropoda? **[2016]**
(a) Chitinous exoskeleton (b) Metameric segmentation
(c) Parapodia (d) Jointed appendages

8. Which of the following characteristic features always holds true for the corresponding group of animals? [2016]
- (a) Cartilaginous – Chondrichthyes endoskeleton (b) Viviparous – Mammalia
 (c) Possess a mouth – Chordata with an upper and a lower jaw
 (d) 3 - chambered heart – Reptilia with one incompletely divided ventricle
9. Which one of the following characteristics is not shared by birds and mammals? [2016]
- (a) Ossified endoskeleton (b) Breathing using lungs
 (c) Viviparity (d) Warm blooded nature
10. Which of the following characteristics is mainly responsible for diversification of insects on land? [2015]
- (a) Bilateral symmetry (b) Exoskeleton (c) Eyes (d) Segmentation
11. Metagenesis refers to [2015]
- (a) alteration of generation between asexual and sexual phases of an organisms.
 (b) occurrence of a drastic change in form during post-embryonic development.
 (c) presence of a segmented body and parthenogenetic mode of reproduction.
 (d) presence of different morphic forms.
12. Body having meshwork of cell, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum: [2015]
- (a) Porifera (b) Mollusca (c) Protozoa (d) Coelenterate
13. Which of the following represents the correct combination without any exception? [2015]

Characteristics	Class
(a) Mouth ventral, gills without operculum; skin with placoid scales; persistent notochord	Chondrichthyes
(b) Sucking and circular mouth; jaws absent, integument without scales; paired appendages	Cyclostomata
(c) Body covered with feathers; skin moist and glandular; fore-limbs form wings; lungs with air sacs	Aves
(d) Mammary gland; hair on body; pinnae; two pairs of limbs	Mammalia

14. A jawless fish, which lays eggs in fresh water and whose ammocoetes larvae after metamorphosis return to the ocean is [2015]
- (a) Myxine (b) Neomyxine (c) Petromyzon (d) Eptatretus
15. Which of the following animals is not viviparous? [2015]
- (a) Elephant (b) Platypus (c) Whale (d) Flying fox (bat)
16. Select the taxon mentioned that represents both marine and fresh water species. [2014]
- (a) Echinoderms (b) Ctenophora (c) Cephalochordata (d) Cnidaria

17. Which one of the following living organisms completely lacks a cell wall? [2014]
 (a) Cyanobacteria (b) Sea – fan (Gorgonia) (c) Saccharomyces
 (d) Blue–green algae
18. Planaria possesses high capacity of _____. [2014]
 (a) metamorphosis (b) regeneration
 (c) alternation of generation (d) bioluminescence
19. A marine cartilaginous fish that can produce electric current is: [2014]
 (a) Pristis (b) Torpedo (c) Trygon (d) Scoliodon
20. Match the following organisms with their respective characteristics:- [NEET-2019]
 (a) Pila (i) Flame cells
 (b) Bombyx (ii) Comb plates
 (c) Pleurobrachia (iii) Radula
 (d) Taenia (iv) Malpighian tubules
- Select the correct option from the following :-
 (a) (b) (c) (d) (a) (b) (c) (d) (a) (b) (c) (d) (a) (b) (c) (d)
 (1) (iii) (ii) (i) (iv) (2) (iii) (iv) (ii) (i) (3) (ii) (iv) (iii) (i) (4) (iiii) (ii) (iv) (i)
21. Match the following genera with their respective phylum: [NEET-2019 ODISSA]
 (a) Ophura (i) Mollusca
 (b) Physalia (ii) Platyhelminthes
 (c) Pinctada (iii) Echinodermata
 (d) Planaria (iv) Coelenterata
- Select the correct option:
 (1) (a)-(iv), (b)-(i), (c)-(iii), d-(ii) (2) (a)-(iii), (b)-(iv), (c)-(i), d-(ii)
 (3) (a)-(i), (b)-(iii), (c)-(iv), d-(ii) (4) (a)-(iii), (b)-(iv), (c)-(ii), d-(i)
22. Which of the following animals are true coelomates with bilateral symmetry? [NEET-2019 ODISSA]
 (1) Adult Echinoderms (2) Aschelminthes (3) Platyhelminthes (4) Annelids
23. Which of the following options does correctly represent the characteristic features of phylum Annelida ? [NEET-2020 COVID]
 (1) Triploblastic, unsegmented body and bilaterally symmetrical.
 (2) Triploblastic, segmented body and bilaterally symmetrical.
 (3) Triploblastic, flattened body and acoelomate condition.
 (4) Diploblastic, mostly marine and radially symmetrical.
24. Match the following group of organisms with their respective distinctive characteristics and select the correct option : [NEET-2020 COVID]
- | Organisms | Characteristics |
|---------------------|---|
| (a) Platyhelminthes | (i) Cylindrical body with no segmentation |
| (b) Echinoderms | (ii) Warm blooded animals with direct development |
| (c) Hemichordates | (iii) Bilateral symmetry with incomplete digestive system |
| (d) Aves | (iv) Radial symmetry with indirect development |
- (1) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii) (2) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
 (3) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii) (4) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
25. Match the following columns and select the correct option: [NEET-2020 COVID]
- | Column - I | Column - II |
|------------------|-----------------|
| (a) Aptenodytes | (i) Flying fox |
| (b) Pteropus | (ii) Angel fish |
| (c) Pterophyllum | (iii) Lamprey |
| (d) Petromyzon | (iv) Penguin |
- (1) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i) (2) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

- (3) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii) (4) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

26. All vertebrates are chordates but all chordates are not vertebrates, why?

[NEET-2020 COVID]

- (1) Notochord is replaced by vertebral column in adult of some chordates.
 (2) Ventral hollow nerve cord remains throughout life in some chordates.
 (3) All chordates possess vertebral column.
 (4) All chordates possess notochord throughout their life.

27. Which of the following statements are true for the phylum – Chordata? [NEET-2020]

- a) In Urochordata notochord extends from head to tail and it is present throughout their life
 b) In Vertebrata notochord is present during the embryonic period only
 c) Central nervous system is dorsal and hollow
 d) Chordata is divided into 3 subphyla : Hemichordata, Tunicata and Cephalochordata

- 1) (b) and (c) 2) (d) and (c) 3) (c) and (a) 4) (a) and (b)

28. Match the following columns and select the correct option [NEET-2020]

- | Column – I | | | | Column – II | | | | | |
|------------|--|-----|-------|-------------|------------|-------|-------|------|------|
| (a) | Gregarious, polyphagous pest | | | (i) | Asterias | | | | |
| (b) | Adult with radial symmetry and larva with bilateral symmetry | | | (ii) | Scorpion | | | | |
| (c) | Book lungs | | | (iii) | Ctenoplana | | | | |
| (d) | Bioluminescence | | | (iv) | Locusta | | | | |
| | (a) | (b) | (c) | (d) | (a) | (b) | (c) | (d) | |
| 1) | (ii) | (i) | (iii) | (iv) | 2) | (i) | (iii) | (ii) | (iv) |
| 3) | (iv) | (i) | (ii) | (iii) | 4) | (iii) | (ii) | (i) | (iv) |

29. Match the following columns and select the correct option [NEET-2020]

- | Column-I | | | | Column-II | | | | |
|----------|--------------------------|-----|-----|-----------|----------------|--|--|--|
| a) | 6-15 pairs of gill slits | | | i) | Trygon | | | |
| b) | Heterocercal caudal fin | | | ii) | Cyclostomes | | | |
| c) | Air Bladder | | | iii) | Chondrichthyes | | | |
| d) | Poison sting | | | iv) | Osteichthyes | | | |
| | (a) | (b) | (c) | (d) | | | | |
| 1) | i | iv | iii | ii | | | | |
| 2) | ii | iii | iv | i | | | | |
| 3) | iii | ii | iii | i | | | | |
| 4) | iv | ii | iii | i | | | | |

30. Bilateral symmetrical and acoelomate animals are exemplified by [NEET-2020]

- 1) Annelida 2) Ctenophora 3) Platyhelminthes 4) Aschelminthes

31. Match List-I with List-II [NEET-2021]

List-I		List-II	
(a)	Metamerism	(i)	Coelenterata
(b)	Canal plates	(ii)	Ctenophora
(c)	Comb plates	(iii)	Annelida
(d)	Cnidoblasta	(iv)	Porifera

Choose the correct answer from the options given below.

- | | | | | |
|----|-------|-------|------|-------|
| | (a) | (b) | (c) | (d) |
| 1) | (iii) | (iv) | (i) | (ii) |
| 2) | (iii) | (iv) | (ii) | (i) |
| 3) | (iv) | (i) | (ii) | (iii) |
| 4) | (iv) | (iii) | (i) | (ii) |

32. Read the following statements

[NEET-2021]

- a) Metagenesis is observed in Helminths
- b) Round worms have organ –system level of body organization
- c) Comb plates present in ctenophores help in digestion
- e) Water vascular system is characteristic of Echinoderms

Choose the correct answer from the options given below

- 1) (a), (b) and (c) are correct
- 2) (a), (d) and (e) are correct
- 3) (b), (c) and (e) are correct
- 4) (c), (d) and (e) are correct

33. Which one of the following organisms bears hollow and pneumatic long bones ?

[NEET-2021]

- 1) Hemidactylus
- 2) Macropus
- 3) Ornithorhynchus

4) Neophron

34. Match the following:

[NEET-2021]

List – I	List – II
a) Physalia	i) Pearl oyster
b) Limulus	ii) Portuguese Man of War
c) Ancylostoma	iii) Living fossil
d) Pinctada	iv) Hookworm

Choose the correct answer from the options given below

- 1) a-iv, b-i, c-iii, d-ii
- 2) a-ii, b-iii, c-iv, d-i
- 3) a-i, b-iv, c-iii, d-ii
- 4) a-ii, b-iii, c-i, d-iv

35. Exoskeleton of arthropods is composed of:

[NEET-2022]

- 1) Cutin
- 2) Cellulose
- 3) Chitin
- 4) Glucosamine

36. In which of the following animals, digestive tract has additional chambers like crop and gizzard?

[NEET-2022]

- 1) *Corvus*, *Columba*, *Chameleon*
- 2) *Bufo*, *Balaenoptera*, *Bangarus*
- 3) *Catla*, *Columba*, *Crocodylus*
- 4) *Pavo*, *Psittacula*, *Corvus*

37. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R).

[NEET-2022]

Assertion (A): All vertebrates are chordates but all chordates are not vertebrates.

Reason (R): Notochord is replaced by vertebral column in the adult vertebrates.

In the light of the above statements, choose the most appropriate answer from the options given below:

- 1) Both (A) and (R) are correct and (R) is the correct explanation of (A)
- 2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- 3) (A) is correct but (R) is not correct
- 4) (A) is not correct but (R) is correct.

38. Match List I with List II:

List I	List II
A. Pterophyllum.	I. Hag fish
B. Myxine	II. Saw fish
C. Pristis.	III. Angel fish
D. Exocoetus.	IV. Flying fish

Choose the correct answer from the options given below:

- (a) A-II, B-I, C-III, D-IV
- (b) A-III, B-I, C-II, D-IV
- (c) A-IV, B-I, C-II, D-III
- (d) A-III, B-II, C-I, D-IV

[NEET 2024]

39 Radial symmetry is NOT found in adults of phylum

- (a) Echinodermata (b) Ctenophora
- (c) Hemichordata (d) Coelenterata

[NEET 2023]

40 Radial symmetry is NOT found in adults of phylum

- (a) Hemichordata (b) Coelenterata
- (c) Echinodermata (d) Ctenophora

[NEET 2023]

41. While trying to find out the characteristic of a newly found animal, a researcher did the histology of adult animal and observed a cavity with presence of mesodermal tissue towards the body wall but no mesodermal tissue was observed towards the alimentary canal. What could be the possible coelome of that animal?

- (a) Acoelomate
- (b) Pseudocoelomate
- (c) Schizocoelomate
- (d) Spongocoelomate

[NEET 2025]

42. All living members of the class Cyclostomata are:

- (a) Free living
- (b) Endoparasite
- (c) Symbiotic
- (d) Ectoparasite

[NEET 2025]

43. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): All vertebrates are chordates but all chordates are not vertebrate.

Reason (R): The members of subphylum vertebrata possess notochord, during the embryonic period, the notochord is replaced by a cartilaginous or bony vertebral column in adults.

In the light of the above statements, choose the correct answer from the options given below:

- (a) Both **A** and **R** are true and **R** is the correct explanation of **A**
- (b) Both **A** and **R** are true but **R** is not the correct explanation of **A**
- (c) **A** is true but **R** is false
- (d) **A** is false but **R** is true

[NEET 2025]

NCERT LINE BY LINE QUESTIONS - ANSWERS

Q.	1	2	3	4	5	6	7	8	9	10
Ans.	A	C	D	B	C	B	C	A	C	D
Q.	11	12	13	14	15	16	17	18	19	20
Ans.	A	C	B	D	A	D	A	D	B	D
Q.	21	22	23	24	25	26	27	28	29	30

Ans.	D	B	C	A	B	B	A	D	B	A
Q.	31	32	33	34	35	36	37	38	39	40
Ans.	A	C	C	B	A	A	C	B	C	A
Q.	41	42	43	44	45	46	47	48	49	50
Ans.	D	B	C	A	D	B	C	C	C	A
Q.	51	52	53	54	55	56	57	58	59	60
Ans.	B	A	A	C	C	A	C	A	B	D
Q.	61	62	63	64	65	66	67	68	69	70
Ans.	C	A	D	A	B	D	A	A	D	B
Q.	71	72	73	74	75	76	77	78	79	80
Ans.	C	B	C	D	A	A	B	A	B	A
Q.	81	82	83	84	85	86	87	88	89	90
Ans.	D	B	A	A	D	A	D	C	C	D
Q.	91	92	93	94	95	96	97	98	99	100
Ans.	D	D	D	A	B	C	D	B	C	B
Q.	101	102	103	104	105	106	107	108	109	110
Ans.	D	B	A	D	A	B	C	A	C	A
Q.	111	112	113	114	115	116	117	118	119	120
Ans.	C	B	D	D	A	C	B	A	A	C
Q.	121	122	123	124	125	126	127	128	129	130
Ans.	B	A	A	A	D	C	B	D	D	B
Q.	131	132	133	134	135	136	137	138	139	140
Ans.	A	C	D	D	C	A	D	D	D	D
Q.	141	142	143	144	145	146				
Ans.	D	D	B	A	C	D				

NEET PREVIOUS YEARS QUESTIONS-ANSWERS

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

NEET PREVIOUS YEARS QUESTIONS-EXPLANATIONS

- 1. (a)** Metamorphosis refers to transformation of larva into adult. Animal that perform metamorphosis are said to have indirect development. Metamorphosis in insects includes the transformation of a maggot into an adult fly and a caterpillar into a butterfly and, in amphibians, the changing of a tadpole into a frog. In earthworm development is direct which means no larval stage are there and hence no metamorphosis.
- 2. (b)** The two extremes in the animal kingdom are endothermic homeotherms and ectothermic poikilotherms. Most mammals, including humans, as well as most birds are endothermic homeotherms, while most fish, invertebrates, reptiles, and amphibians are ectothermic poikilotherms. Chelone (Turtle) belongs to class reptilia which is poikilotherm or cold blooded.
- 3. (d)** The digestive tract of aves has additional chambers in their digestive system as crop and gizzard. Crop is concerned with storage of food grains, whereas gizzard is a masticatory organ in birds used to crush food grain.

4. **(b)** In poriferans (sponges) choanocytes (collar cells) form lining of spongocoel. Flagella present in collar cells provide circulation to water in water canal system.
5. **(b)** Pharyngeal gill slits are present in hemichordates and in chordates. Notochord is present in chordates only. Ventral tubular nerve cord is present in non-chordates.
6. **(b)** Sharks and Trygon (sting ray) are the members of cartilaginous fish while whale, dolphin and seals are aquatic mammal.
7. **(c)** All arthropods possess a stiff exoskeleton (external skeleton) composed primarily of chitin. Arthropod bodies are divided into segments. Parapodia are paired, lateral appendages extending from the body segments. Arthropod appendages may be either biramous (branched) or uniramous (unbranched). They do not possess jointed appendages.
8. **(a)** Chondrichthyes always have cartilaginous endoskeleton. Most mammals are viviparous, giving birth to young ones. However, the five species of monotreme, the Platypus and the Echidna, lay eggs. Chordates have jawless animals (agnatha) as well. Most reptiles have 3 chambered heart. Crocodilians have 4 chambered hearts. Turtles have 3 chambered heart but with an incomplete wall in the single ventricle, so their hearts are functionally 4 chambered.
9. **(c)** Viviparity is not shared by birds and mammals. Viviparity is a process of giving birth to young that develop within the mother's body rather than hatching from eggs. All mammals except the monotremes are viviparous.
10. **(b)** The exoskeleton of insects consists of chitinous cuticle. It gets hardened due to the deposition of calcium. It prevents dessication and gives protection.
11. **(a)** Metagenesis is defined as alternation of generation found in phylum cnidaria (eg. Obelia). In this phenomenon one generation of an organism reproduces asexually, followed by a sexually reproducing generation.
12. **(a)**
13. **(a)** (i) Aves possess dry skin, without glands except oil gland near the base of tail. (ii) Pinnae are not found in aquatic animals and egg laying mammals. (iii) In cyclostomes, unpaired appendages (joints) are found.
14. **(c)** *Petromyzon marinus*, commonly known as sea lamprey lays eggs in fresh water and its larvae, after metamorphosis, return to the ocean (saline water).
15. **(b)** Platypus is an oviparous (egg laying animal). It belongs to the class-mammalia.
16. **(d)** Members of ctenophora, cephalochordata and echinodermata are exclusively marine.
17. **(b)** *Gorgonia* (sea-fan) is an animal. All animals lack cell wall.
18. **(b)** *Planaria* is a flatworm which possesses a high capacity of regeneration.
19. **(b)** *Torpedo* is a sluggish fish. It is carnivorous. The prey is killed due to electric shock. The shock can also be harmful for human beings.
27. In vertebrata, notochord is present during embryonic period only as it is replaced by vertebral column. In chordates, central nervous system is dorsal and hollow.
28. *Locusta* is a gregarious pest. In Echinoderms, adults are radially symmetrical but larvae are bilaterally symmetrical. Scorpions respire through book lungs. Bioluminescence is well marked in ctenophores.

29. Cyclostomes shows 6-15 pairs of gill slits for respiration
Air bladder is present in class Osteichthyes
Trygon, a cartilaginous fish, possesses poison sting
Heterocercal caudal fin is present in class Chondrichthyes
30. Platyhelminthes are bilaterally symmetrical and acoelomate animals with organ level of organisation.

31. Matchings:

List-I		List-II	
(a)	Metamerism	(i)	Annelida
(b)	Canal System	(ii)	Porifera
(c)	Comb plates	(iii)	Ctenophora
(d)	Cnidoblasta	(iv)	Cnidaria

32. 1. Echinoderms are triploblastic and coelomate animals.
2. Round worms have organ system level of body organisation
3. Water vascular system is characteristic of echinoderms

33. Hemidactylus – wall lizard – reptile
Macropus - Mammal
Ornithorhynchus - Mammal (Oviparous)
Neophron - Bird - Pneumatic bones

34. Physalia - Portuguese Man of War
Limulus - Living fossil
Ancylostoma - Hookworm
Pinctada - Pearl oyster

35 Exoskeleton of arthropods is composed of CHITIN

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36 *Pavo*, *Psittacula*, *Corvus* are birds having additional chambers like crop & gizzard

37 Reason explains Assertion

38 Ans. (b)

Explanation

The correct option is option (b) as
Pterophyllum is the scientific name for Angel fish.
Myxine is the scientific name for Hag fish.
Pristis is the scientific name for Saw fish.
Exocoetus is the scientific name for Flying fish.

39 Ans. (c)

Explanation

Radial symmetry: When any plane passing through the central axis of the body divides the organism into two identical halves.
Bilateral symmetry: When the body can be divided into identical left and right halves in only one plane.
The adult echinoderms are radially symmetrical but larvae are bilaterally symmetrical.
Coelenterates and Ctenophores are radially symmetrical animals.
Hemichordates are bilaterally symmetrical animals.

40 Ans. (a)

Explanation

Radial symmetry is a type of symmetry where an organism can be divided into similar halves by more than two planes passing through the central axis. This type of symmetry is found in organisms that tend to meet their environment in all directions, such as aquatic animals.

Hemichordata : Adult organisms in this phylum, which includes acorn worms, pterobranchs, and graptolites, exhibit bilateral symmetry. This means they can be divided into two identical halves only along a single plane. Hence, radial symmetry is not found in the adults of this phylum.

Coelenterata (also known as Cnidaria) : This phylum includes jellyfish, sea anemones, and corals. They exhibit radial symmetry. So, radial symmetry is found in this phylum.

Echinodermata : Adult organisms in this phylum, which includes starfish, sea urchins, and sea cucumbers, exhibit radial symmetry. However, it's important to note that their larvae exhibit bilateral symmetry. Therefore, radial symmetry is found in adults of this phylum.

Ctenophora (also known as comb jellies) : These marine animals also exhibit radial symmetry. Thus, radial symmetry is found in this phylum.

41.Ans. (b)**Explanation**

In certain animals, the body cavity is not fully lined by mesoderm. Instead, the mesoderm exists as scattered pouches between the ectoderm and endoderm and generally the mesoderm lines only the body wall (it's present next to the ectoderm), and does not surround the alimentary canal.

Eg- Aschelminthes.

42.Ans. (d)**Explanation**

All living members of the class Cyclostomata are ectoparasites on some fishes.

43.Ans. (a)**Explanation**

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

About us

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