1.ANIMAL KINGDOM



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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.



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.





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 Pl<mark>an</mark>

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 or T n r a 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, eg., 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, eg., in flatwprms 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

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

Phylum Coetentcrata (Cnidana)

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



Advancement Over Sponges

The chidarians 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 (Ketene 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.



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.

Genera<mark>l F</mark>eatures:

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 accelomate. The space between the body wall and body organ is filled by.



Examples of Platyhelminthes

Phylum Aschelminthes

Phylum Aschelminthes or Nemathelminthes 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 Walt 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.
- Ancyclostoma duodenale or hookworm is an endoparasite in the small intestine of humans. It causes ancylostomiasis disease.
- Loa loa the eyeworm lives in subdermal connective fissue of man. It causes loiasis disease characterised by subcutaneous smelling mosdy 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.



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 subphylum 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:



- 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 – <mark>Am</mark>phibia

- 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 clasping.
- 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 – <mark>Ma</mark>mmalia

- 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

1.	BASIS OF CLASSIFICATION Which of the following is a basic feature of all the organisms of Animalia? [Pg-46,E] (a.) Multicellular structure (b.) Sensory and neuromotor system (c.) Terrestrial habitat (d.) Locomotion						
2.	Which of the following lack tissue grade organization? [Pg-46,E] (a.) Metazoans (b.) Eumetazoans (c.) Parazoans (d.) None of these						
3.	Match	n <mark>the</mark> columns.			[Pg-46,47,M]		
		Column-I		Column-II			
	(A)	Organ level	(1)	Pheretima (1997)			
	(B)	Cellular aggregate level	(2)	Fasciola			
	(C)	Tissue level	(3)	Spongilla			
	(D)	Organ system level	(4)	Obelia			
	Codes (A) A) 2 B) 2 C) 4	(B) (C) (D) 4 3 1 3 4 1 1 2 3	1	1			

D) If both assertion and reason are false.

4. Choose the correct option

[Pg-47,H]

(a.) Ctenophores and Platyhelminthes possess complete digestive system.

(b.) Aschelminthes to chordates, all possess organ system level of organization along with complete digestive system.

(c.) Coelenterates and Aschelminthes possess organ system level of organization along with complete digestive system.

(d.) Poriferans may possess complete digestive system.

5. The entry of food and exit of waste takes place from separate openings in [Pg-47, M]

- (a.) organisms having incomplete digestive system
- (b.) coelenterates, ctenophores and Platyhelminthes
- (c.) organisms having complete digestive system
- (d.) organisms having cellular level of organization

6. Which of the following is incorrect? [Pg47,M] (a.) Some division of labour (activities) occur among the cells in the members of phylum porifera.

(b.) Division of labour (activities) is completely absent among the cells in poriferans.

(c.) Open circulatory system is found in Tunicates, hemichordates, and noncephalopod

molluscs. (d.) All of these

- 7. Choose the incorrect option.
 - (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

[Pg-47,M]

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



- (a.) A Molluscs, B Chordates
- (b.) A Annelida, B Porifera
- (c.) A Coelenterates, B Platyhelminthes
- (d.) A Molluscs, B Porifera
- Which of the following option is wrong? 12.
 - (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: Nemathelminthes, 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?
 - (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.

[Pg-47,M]

[Pg-47,M]

[Pg-48,H]

(b.) Digestive cavity is found in accelomates, 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.



	А	В	С	D
A)	Bilateral	Porifera	Ctenophora	Coelomat e
B)	Radial	Porifera	Ctenophora	Acoeloma te
C)	Bilateral	Porifera	Ctenophora	Coelomat e
D)	Radial	Ctenophora	Porifera	Acoeloma te

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 (d.) I only

(c.) II, III and IV

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	В
22. 23.	A) A= Exoskeleton, B= Dorsal in B) A= Endoskeleton; B= Ventral C) A= Exoskeleton; B= Ventral in D) A= Endoskeleton; B= Dorsal in True coelom appear in which c (a.) Echinodermata (b.) / (c.) Platyhelminthes (d.) / The layer absent in the embryo (a.) ectoderm (b.) endod	chordates as well as in non-chordates in chordates as well as in non-chordates in chordates and dorsal in nonchordates in chordates and ventral in nonchordates of the following during evolution? [Pg-48,E] Annelida Aschelminthes as of diploblastic animals is [Pg-47,E] erm (c.) mesoderm (d.) mesoglea
24.	Nerve cells and tissue level of c (a.) coelenterates (b.) ctenor	brganization first appeared in [Pg-46,E] bhora (c.) chordate (d.) porifera
25.	In some animal groups, the boo organs. This characteristic featu (a.) segmentation (b.) metarr	dy is found divided into compartments with at least some ure is called [Pg-48,E] nerism (c.) metagenesis (d.) metamorphosis
26.	Body cavity is the cavity preser body cavity is not lined by mes (a.) acoelomate	nt between body wall and gut wall. In some animals the oderm. Such animals are called [Pg-48,E] (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 (A) (B)	e correc (C)	t optic: (D)	n (E)					
	A)13	5	4	2					
	B) 1 2	3	4	5					
	C) 5 4	3	2	1					
	D) 4 3	1	2	5					
28.	Which of t (a.) Adult (c.) Platyh	he follov echinod elminthe	ving ar erms es	nimals are	true coe	lomates w (b.) Asch (d.) Anne	vith bilatero elminthes elids	al symmetr	y? [Pg47,E]
29.	Assertion: cord. [Pg-4 Reason: V (a.) Both A (b.) Both A Assertion. (c.) Asserti (d.) Asserti	ane prim 48,H] ertebral ssertion ssertion on is true on is fals	colum and Re and Re and Re e, but F se, but F	aracter of n is derive eason are eason are Reason is f Reason is	cnoraat d from th true and true, bu alse. true.	es is the pi te notocho Reason is Reason is	resence o ord. correct e not the co	xplanation orrect expl	of Assertion. anation of
30.	Assertion: A danger. Re [Pg-47,H]	Animals eason: It	with ra allows	dial symm animal to	be able	more adve to respon	antage in d to stimu	detecting lus from an	food and by direction.
	(a.) Both A (b.) Both A Assertion. (c.) Asserti (d.) Asserti	on is true	and Re and Re e, but F se, but	eason are eason are Reason is f Reason is	true and true, bu alse. true.	Reason is	not the co	xplanation orrect expl	of Assertion. anation of
31.	Assertion: A mesoderm 48,H] (a.) Both A (b.) Both A (b.) Both A Assertion. (c.) Asserti (d.) Asserti	Aschelm is prese ssertion on is true on is fals	inthes ent as s and Re and Re e, but F ie, but	represent cattered p eason are eason are Reason is f Reason is	pseudoo bouches true and true, but alse. true. PORIFE	coelomate in betwee I Reason is Reason is	es. Reason en ectoder correct e not the co	: In aschelr m and eno xplanation orrect expl	ninthes, doderm. [Pg- of Assertion. anation of
32.	Sponges c	ire							[Pg-49,E]
	(a.) with w gametes (c.) both (ater cai a) and (nal syst b)	em	(b.) s (d.) s	exually rep essile or fre	producing ee-swimmi	by format ing	ion of
33.	In case of (a.) ostia	porifera	ns, the	spongoco (b.) oscu	oel is line Ila	d with flag (c.) choc	ellated ce anocytes	ells called (d.) meser	[Pg49,E] achymal cells
34.	Body havir and indire (a.) coeler	ng mesh ct devel nterate	work c opmei	of cells, inte nt are the (b.) porif	ernal cav characte era	vities lined eristics of p (c.) Mollu	with food hylum Jsca	filtering flag [Pg4 (d.)	gellated cells 19,E] protozoa
35.	In most sim following v (a.) Ostia -	nple type ways? [P → Spong	e of ca g-49, <i>N</i> gocoel	nal system Ⅰ] → Osculu	n of porifient $m \rightarrow External for the second second$	era, water erior	flows thro	ugh which	one of the

(b.) Spongocoel \rightarrow Ostia \rightarrow Osculum \rightarrow Exterior (c.) Osculum \rightarrow Spongocoel \rightarrow Ostia \rightarrow Exterior

(d.) Osculum \rightarrow Ostia \rightarrow Spongocoel \rightarrow Exterior

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



(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.



- (b.) A and B are sessile form
- (c.) A produce B asexually and B form the 'A' sexually

(a)

- (d.) B produce A sexually and A form the 'B' sexually
- 44. Match the columns.

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

Select the correct option

(A)	(B)	(C)	(D)
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 (a.) sea anemone (b.) sea pen (c.) sea fan
- (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-50,E]

[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.



(V) Alimentary canal is complete with a well-developed muscular pharynx.

IV

I, II

III, IV

II, III

Platyhelminthes

Aschelminthes

V

V

L

III. V

Ctenophores

I, II, III

IV

1, 11

IV, V

A)

B)

C)

D)

53.	Phylum Platyhelminthes members are	[Pg-51,M]
	(b.) bilaterally symmetrical triploblastic and accelomates	
	(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.
	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. Rec	ison: These
	organisms possess internal as well as external tertilization.	[Pg-51,H]
	(b.) Both Assertion and Reason are true, but Reason is not the correct explanation	onation of
	Assertion.	
	(c.) Assertion is true, but Reason is false.	
	(d.) Assertion is false, but Reason is true.	
	ASCHELMINIHES	
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.) Land III (b.) II and IV	
L	(c.) I, II and IV (a.) IV only	
57.	Choose the incorrect option. [Pg5	0,51,52,M]
	(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 differe	nt functions?
	[Pg-52,M]	
	(a.) Chodhocytes (b.) Interstitial cells (c.) Gastrodermal cells (d.) Nematocysts	
50	Plead sucking leach is	[Pa 52 5]
57.	(a.) Nereis (b.) Hirudinaria (c.) Pheretima (d.) All of these	[Fg-52,E]
60	Which one of the following endoparasites of humans does show vivingrity?	[Pa52 F]
55.	(a.) Ancylostoma duodenale (b.) Enterobius spiralis	[' 3~~,-]
	(c.) Trichinella spiralis (d.) Ascaris lumbricoides	
61.	Assertion: Aschelminthes and Annelids possess bilateral symmetry. [Pg-52,N	Ŋ
1	Reason: Both Aschelminthes and Annelids are coelomates.	
1	(a.) Both Assertion and Reason are true and Reason is correct explanation	of Assertion.
1	(b.) Both Assertion and Reason are true, but Reason is not the correct explo	anation of
1	Assemon.	
1		

(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] (b.) Aschelminthes (a.) Adult echinoderms (d.) Annelids
 - (c.) Platyhelminthes
- 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.
- Match the columns 65.

	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)
- 2 A) 1 3 4 B) 2 3 1 4
- C) 4 3 2 1
- D) 3 1 4 2
- Choose the incorrect statement. 66.

(a.) In cockroaches and prawns, excretion of waste material occurs through malphiaian tubules. [Pg55,M] [Pg-51]

- (b.) In ctenophores, locomotion is mediated by comb plates.
- (c.) In fasciola, flame cells take part in excretion.
- (d.) Earthworms are hermaphrodites and yet cross fertilization takes place among them. [Pg-52]
- 67. Consider the following statements:
 - (I) Triploblastic, bilateral symmetry
 - (II) Metamerically segmental and coelomate animals
 - (III) Dioecious
 - (IV) Closed circulatory system
 - (V) Lateral appendages

[Pg-51]

[Pg52,M]



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 (c.) moth (d.) butterfly (b.) crab 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. С В Α D Scorpion Prawn Loligo (a) Asterias Scorpion Octopus Prawn Ophiura (b) Locust Butterfly Loligo Asterias (C) (d) Squid Locust Prawn 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.) | and ||| (c.) |, || and |||
- (b.) I, II and IV (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.

C



	A	В	С
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)	p <mark>res</mark> ent 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	Aves
		air sacs forelimbs from wings	
97.	Amo ome (a.) N	ng the following ed <mark>ible fishe</mark> s, which one is a marine fish h ga-3 fatty acid <mark>s?</mark> Nystus (<mark>b.) M</mark> angur (c.) Mrigala (d.) Macke	aving rich source of [Pg-57,E] rel
98.	Whic (a.) ((b.) E (c.) S (d.) P	n one is not cartilaginous fish? Carcharoden (great white shark), Trygon (sting ray) xocoetus (flying fish), catla (katla), clarias (Mangur) colidon (dog fish) ristis (saw fish)	[Pg57,E]
99.	Follov fish. (a.) F (c.) B	ving are few examples of bony fishes. Choose the odd or ying fish (b.) Hippocampus (sea horse) oth (a) and (b) (d.) Labeo (rohu), catla, claric	ne out as marine bony [Pg-57,E] xs
100.	Whic (a.) ((b.) P (c.) N (d.) A	n of the following is not a characteristic of class chondrich Fill slits are separated and without operculum. redaceons with powerful jaws. otochord is persistent throughout life. irbladder present.	nthyes? [Pg-56,M]
101.	Whic group (a.) V (b.) P (c.) T (d.) C	n of the following characteristic features always holds true of animals? iviparous Mammalia ossess a mouth with an upper and a lower jaw Chordata nree-chambered heart with one incompletely divided ve Cartilaginous endoskeleton Chondrichthyes	e for the correspondin [Pg-56- 59,H] ntricle Reptilia
102.	Bony (a.) h (c.) v	fishes are [Pg-57,E] aving external f <mark>ertilization</mark> (b.) mostly oviparous <i>r</i> ith direct development (d.) all of these	
103.	Bony 57,E] (a.) C	fishes stay at any particular depth in water without spend Operculum (b.) Neuromuscles (c.) Pneumatic bo	ling energy due to [Pg ones (d.) Swim blad
104.	Choc (a.) B (b.) C (c.) N (d.) F	ose the incorrect statement? [Pg56,M] oth cartilaginous and bony fishes are dioecious Cartilaginous fishes show sexual dimorphism Nale cartilaginous fish have claspers emale cartilaginous fish have claspers	
105.	Choo	ose the correct option for the given figures.	



- (a.) Pigmented skin
- (c.) Viviparity

- (b.) Pneumatic bones
- (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)	Urochorad <mark>ata</mark>
(C)	Tunicates	(3)	Agnatha
(D)	Balanoglossus	(4)	Pisces
(E)	Osteichthyes	(5)	Tetrapod

C<mark>od</mark>es

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 PhylumChordata [Pg-55,E] (a.) Hemichordata (b.) Vertebrata (c.) Cephalochordata (d.) Urochordata

					www.amantacauemy.com
120.	Protoc (a.) inc (c.) ha	hordates [Pg-5 clude Urochord ve notochord	5,E] lata c throu	ınd cephalochor ghout life	date (b.) are exclusively marine (d.) All of these
121. (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. (Choos	e the correct c	ption	for the animals s	hown below.
	(a.) The (b.) Ciu (c.) De (d.) Fre	e organism bel culatory syster velopment is c esh water dwell	ongs n is op always ling.	to cephalochorc pen type. s direct.	ate and genus Ascidia.
123. 1	123. Th <mark>e s</mark> kin of amphibians[Pg-57,E] (a.) can be smooth or rough (c.) possess eutaneous glands (d.) both (a) and (b)			(b.) are usually with Scales (d.) both (a) and (b)	
124.	124. In amphibians [Pg-57,E] (a.) mole copulatory organs are absent (c.) tadpole stage is universally present(b.) metamorphosis is usually absend (d.) cranial nerves are absent				
125. I	Read t	he following st	atem	ents. [Pg57,58,H]	
	(I) Rete	ention of larval	trait is	s called neoteny	
	(II) The	largest amphil	oian is	s Cryptobrances.	avaa bibiaya ayad xa akilee
	(III) Se) (IV) I ~	rinousia is a co	nnec'	ung link betweer	amphibian and reptiles.
c	(V) AxolotIs are amphibians formed without undergoing metamorphosis. Choose the correct statement				
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 (a.) Sexes are separate. (b.) Kidneys are metanephric. (c.) Limbs are always present and (d.) Possess creeping or crawling r	or class Reptilia. [Pg-58,M] are two pairs. mode of locomotion.
128.	Birds [Pg-58,E] (a.) are poikilotherms air sacs (c.) are bipeds	(b.) have respiration performed only by the (d.) endoskeleton is ossified partially
129.	Find th <mark>e i</mark> ncorrect match [Pg-58,59 (a.) Crow – Corvus (c.) Parrot – Psittacula	9,M] (b.) <mark>Pigeon – Co</mark> lumba (d.) Penguin – Pavo
130.	Which of the following is incorrect (a.) Aves possess poor olfactory sy (b.) Aves are partially homeotherr (c.) Aves bones are hollow with air (d.) Aves have sexes separate, fer development.	? [Pg58,M] vstem. ms. r cavities. rtilization is internal, oviparous with direct
131.	Syrinx present in birds [Pg-58,E] (a.) helps in producing sound (b.) lie near the junction of trache (c.) both (a.) and (b.) (d.) helps in excretion of urea	a and bronchi
132.	The most unique mammalia charce (a.) the presence of two pairs of lin (b.) reproducing young ones (c.) the presence of mammary glo (d.) the presence of skin	acter is [Pg-58,E] mbs ands
133.	The skin of the mammals is unique (a.) glands (b.) epic (c.) hair (c	in possessing [Pg-59,E] dermal layer d.) both (a.) and (c.)
134.	Heart is always four chambered in (a.) mammals (b (c.) reptiles (d.) both	n[Pg59,E] o.) aves h (a) and (b)
135.	Choose the correct statements fro (a.) Mammals, birds, reptiles and c (b.) In aquatic mammalian males, (c.) The neck of mammals genera (d.) Archeopteryx is a fossil animal	om the following: [Pg-59,M] amphibians possess 12 pairs of cranial nerves. , testes lie outside the body cavity in scrotal sacs ally possess 5 cervical vertebrae I.

- 136. Choose the odd one out. [Pg-60,M](a.) Prototheria Ornithorlynchus(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	В	Nipples present
С	Vagina and uterus pr <mark>esent</mark>	Vagina and uterus present
Ea <mark>r is</mark> devoid of pinna	Pinna is p <mark>resent</mark>	D
Scrotum absent	Scrotum p <mark>resent</mark>	Scrotum present
 A) A = Oviparous B = Nipples present C = Vagina and uterus of D = Pinna is absent in ad B) A = Oviparous B = Nipples present C = Vagina and uterus of D = Pinna is universally for C) A = Viviparous B = Nipples present C = Vagina and uterus of D = Pinna is absent in ad D = Pinna is absent in ad D = Pinna is present only 138. Tetrapods [Pg-57-60] (a.) lack paired appendages of (b.) universally possess gills (c.) possess sense organ function 	absent quatic forms absent quatic forms absent y in aquatic forms. and pentadactyl limb	a constant of the second

(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 abs ent	В

Erythrocytes oval, biconvex and nucleated	RBC oval, biconvex and nucleate d	Erythrocytes oval, biconvex x and nuclea ted	RBC circular biconcave and non-nucleated
Three chambered heart	Three chambered heart	С	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 $\operatorname{arch} D$ = 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

1.	Which of the followi	ng animals does not u	ndergo metamorpho	osis?	[2018]
2.	(a) Earthworm Which one of these	(b) Iunicate animals is not a home	(C) Startish otherm?	(d) Moth	[2018]
2	(a) Macropus	(b) Chelone	(c) Psittacula	(d) Camelus	
5.	digestive system.	are group of arminais cl	ndructensed by crop		[2018]
	(a) Amphibia	(b) Reptilia	(c) Osteichthyes	(d) Aves	
4.	In case of poriferant	s, the spongocoel is line	ed with flagellated c	cells called	
		(b) chagnacytes	(c) mesenchymal	cells (d) ostia	[2017]
5.	An important chara (a) ventral tubular n (c) pharynx without	cteristic that hemichor erve cord. aill slits.	dates share with cho (b) pharynx with ((d) absence of no	productions (d) ostid productions is gill slits.	[2017]
6.	(a) Dolphins, Seals, (c) Trygon, Whales,	s is the correct combin Trygon Seals	ation of aquatic ma (b) Whales, Dolph (d) Seals, Dolphin	mmals? nins, Seals s, Sharks	[2017]
7.	Which of the followi (a) Chitinous exoske (c) Parapodia	ng features is not prese leton	ent in the phylum- ar (b) Metameric sec (d) Jointed appe	thropoda? gmentation ndages	[2016]

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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
0	(a) 3 - champered heart – Reptilla with one incompletely divided ventricle Which one of the following characteristics is not shared by birds and mammals? [2014]
1.	(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)
11	Metagenesis refers to
	(a) alteration of generation between asexual and sexual phases of an organisms.
	(b) oc <mark>cu</mark> rrence of a drastic change in form during post-embroyonic development.
	(c) p <mark>res</mark> ence of a segmented body and p <mark>arthenogene</mark> tic mode of reproduction.
10	(d) presence of different morphic forms.
12.	body naving meshwork of cell, internal cavities linea with food filtering flagellated cells
	[2015]
	(a) Porifera (b) Mollusca (c) Protozoa (d) Coelenterate
13.	W <mark>hic</mark> h of the following represents the correct combination without any exception?
	Characteristics Class
	(a) Mouth ventral, gills without Chondrichthyes
	scales: persistent notochord
	(b) Sucking and circular mouth: Cyclostomata
	iaws absent, integriment
	without scales; paired
	appendages
	(c) Body covered with feathers; Aves
	skin moist and glandular;
	fore-limbs form wings;
	lungs with air sacs
	(d) Mammary gland; hair on Mammalia
	body; pinnae; two pairs
	of limbs
14.	A jawless fish, which lays eggs in fresh water and whose ammocoetes larvae after
	(a) Maxima (b) Noomarina (c) Potromazon (d) Entatrotus
15.	Which of the following animals is not viviparous?
	(a) Elephant (b) Platypus (c) Whale (d) Flying fox (bat)
16.	Select the taxon mentioned that represents both marine and fresh water species.
1	[2014] (a) Caphana and an ann ann ann ann ann ann ann a
	(a) comparents (b) cienophora (c) cephalochoraata (a) chiadria

17.	Which one of the following living organisms completely lacks a cell wall?
	(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]
00	(a) Pristis (b) Torpedo (c) Trygon (d) Scoliodon
20.	Match the following organisms with their respective characteristics:- [NEEI-2019]
	(d) Fild (i) Fidthe Cells (b) Bombyr (ii) Comb plates
	(c) Pleurobrachia (ii) Radula
	(d) Taenia (iv) Malpiahian 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) (i) (iv) (2) (iii) (iv) (ii) (i) (3) (ii) (iv) (iii) (i) (4) (iiii) (ii) (iv) (i)
21.	Match the following genera with their resp <mark>ective phylu</mark> m: [NEET-2019 ODISSA]
	(a) Ophura (i) Mollusca
	(b) Physalia (ii) Platyhelminthes
	(c) Pinctada (iii) Echinodermata
	(d) Fidhand (iv) Coelenieraid
	(1) (a)-(iy) (b)-(i) (c)-(iii) (c)-(iii) (b)-(iy) (c)-(i) (c)-(ii)
	(3) (a)-(i) (b)-(iii) (c)-(iv) (d-(ii)) (4) (a)-(iii) (b)-(iv) (c)-(ii) (d-(ii)) (
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) Iripioplastic, Unsegmented body and bilaterally symmetrical.
	(2) Inploblastic, segmented body and bildreidity symmetrical. (3) Triploblastic, flattened body and accelomate 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 alrect development (iii) Pilateral symmetry with incomplete directive 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
	(1) (a)-(III), (b)-(IV), (c)-(II), (a)-(I) (2) (a)-(III), (b)-(IV), (c)-(I), (a)-(II)

	(3) (a)-(iv), (b)-(i), (c)-(ii), (d)-(ii	i) (4)	(a)-(ii), (b)-(i), (c)·	-(iv), (d)-(iii)			
26.	All vertebrates are chordates l	out all chorc	lates are not vert	ebrates, why?			
27.	 Notochord is replaced by v Ventral hollow nerve cord r All chordates possess verte All chordates possess notoc Which of the following statem 	vertebral col emains thro bral column chord throug nents are tru	lumn in adult of s ughout life in son ghout their life. e for the phylum	[NEET-2020 ome chordates. ne chordates. – Chordata?	COVID] [NEET-2020]		
	a) In Urochordata notochord extends from head to tail and it is present throughout their life						
	b) In Vertebrata notochord is	s present du	r <mark>ing t</mark> he embryon	ic period only			
	c) Central nervous system is a	dorsal and h	ollow				
	d) Ch <mark>ord</mark> ata is divided into 3 Cep <mark>ha</mark> lochordata	subphyla : H	l <mark>emicho</mark> rdata, Tu	inicata and			
	1) (<mark>b)</mark> and (c) 2) (c	d) and (c)	3) (c) and (a)	4) (a)	and (b)		
28.	Match the following columns Column – I (a) Gregarious, polyphago (b) Adult with radial symm with bilateral symmetry (c) Book lungs (d) Bioluminescence (a) (b) (c) (d) 1) (ii) (i) (iii) (iv) 3) (iv) (i) (ii) (iii) Match the following columns Column-I Columns Column-I Columns Column-I in Co	and select ous pest etry and lan 2) 4) and select Jmn-II (gon ii) Cyclost iii) Chondi Dsteichthyes	the correct option (i) A (i) A (ii) So (iii) C (iii) C (iv) Lo (iv)	n - II sterias corpion tenoplana ocusta c) (d0) (iv) (iv) on	[NEET-2020]		
30.	4) iv ii iii i Bilateral symmetrical and ac	oelomate ai	nimals are exemp	olified by	[NEET-2020]		
31.	1) Annelida 2) Ctenop Match List-I with List-II	hora	3) Platyhelmin	thes 4) As	chelminthes [NEET-2021]		
	List-I	Li	st-II				
	(a) Metamerism	(I) ((ii) (<u>Coelenterata</u>				
	(c) Comb plates	(iii) A	Annelida				
	(d) Cnidoblasta	(i∨) F	Porifera				



Q.	1	2	3	4	5	6	7	8	9	10
Ans.	А	С	D	В	C	В	С	A	С	D
Q.	11	12	13	14	15	16	17	18	19	20
Ans.	Α	С	В	D	А	D	А	D	В	D
Q.	21	22	23	24	25	26	27	28	29	30
Ans.	D	В	С	А	В	В	А	D	В	А
Q.	31	32	33	34	35	36	37	38	39	40
Ans.	А	С	С	В	А	А	С	В	С	А
Q.	41	42	43	44	45	46	47	48	49	50
Ans.	D	В	С	А	D	В	С	С	С	А
Q.	51	52	53	54	55	56	57	58	59	60
Ans.	В	А	А	С	С	А	С	А	В	D
Q.	61	62	63	64	65	66	67	68	69	70
Ans.	С	А	D	А	В	D	А	А	D	В
Q.	71	72	73	74	75	76	77	78	79	80
Ans.	С	В	С	D	А	А	В	А	В	А
Q.	81	82	83	84	85	86	87	88	89	90
Ans.	D	В	А	А	D	А	D	С	С	D
Q.	91	92	93	94	95	96	97	98	99	100
Ans.	D	D	D	А	В	С	D	В	С	В
Q.	101	102	103	104	105	106	107	108	109	110
Ans.	D	В	А	D	А	В	С	А	С	А
Q.	111	112	113	114	115	116	117	118	119	120
Ans.	С	В	D	D	А	С	В	А	А	С
Q.	121	122	123	124	125	126	127	128	129	130
Ans.	В	А	А	А	D	С	В	D	D	В
Q.	131	132	133	134	135	136	137	138	139	140
Ans.	А	С	D	D	С	А	D	D	D	D
Q.	141	142	143	144	145	146				
Ans.	D	D	В	А	С	D				
NEET PREVIOUS YEARS QUESTIONS-ANSWERS										
1 (a	.) 2 (b	(d)	4 (b)	5 (b)	6 (b)	7 (c)	8 (a)	9 (c)	10 (b)	
11 ((a) 12	(a) 13 (a	a) $14(c)$	15 (b)	16 (d)	17 (b)	18 (b)	19 (b)	20 (2)	
21 ((2) 22	(4) 23 (2	2) 24 (1)	25 (3)	26 (1)	27 (1)	28 (3)	29 (2)	30 (3)	
31 ((2) 32 ((3) 33 (4	4) 34 (2)	35 (3)	36 (4)	37 (1)				

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.

Ch<mark>or</mark>dates have jawless animals (agnath<mark>a) as well.Mos</mark>t 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 chidaria (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 preyis 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 gregareous 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	-1	List-II					
(a)	Metamerism	(i)	Annelida				
(b)	Canal	(ii)	Porifera				
	System						
(C)	Comb plates	(iii)	Ctenophora				
(d)	Cnidoblasta	(iv)	Cnid <mark>aria</mark>				

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)

N<mark>eo</mark>phron - Bird - Pne<mark>umatic bones</mark>

- 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