Chapter 10

Animal Kingdom
(General Accounts & Non-Chordates)

Solutions (Set-1)

SECTION - A

School/Board Exam. Type Questions

Very Short Answer Type Questions :

1. Which type of body symmetry is possessed by Platyhelminthes?

Sol. Bilateral symmetry

2. Name the central cavity in the body of sponges.

Sol. Spongocoel

3. The skeleton of corals is composed of which material?

Sol. Calcium carbonate

4. Define Bioluminescence.

Sol. Bioluminescence is the property of a living organisms to emit light.

5. Name a Platyhelminth having high regeneration capacity.

Sol. *Planaria*

6. Which animal is commonly called hookworm?

Sol. *Ancylostoma*

7. Name the largest phylum of the animal kingdom.

Sol. Arthropoda

8. What do you understand by mantle?

Sol. Mantle is a soft and spongy layer of skin over the visceral hump of molluscs.

9. Mention the characteristic feature of echinoderms.

Sol. Water vascular system.

10. Which type of fertilisation is found in *Balanoglossus*?

Sol. External fertilisation

Short Answer Type Questions :

11. What do you mean by the complete digestive system?

Sol. The digestive tract which has two separate openings, mouth for the intake of food and anus for the elimination of faecal matter is called the complete digestive system.

12. Define mesoglea.

Sol. Mesoglea is an undifferentiated layer made up of jelly-like material, present in between the ectoderm and the endoderm in the developing embryo of diploblastic animals.

13. What is the function of ostia and osculum in the body of a sponge?

Sol. Ostia are the minute pores present in the body wall of sponges which are meant for the entry of water which brings the food, gases (like oxygen) and germ cells with it. Osculum is a large opening to the outside through which water exits with waste products and reproductive elements.

14. Write a comment on the habitat of cnidarians.

Sol. All cnidarians are aquatic; most of them are marine and few are fresh water animals *e.g. Hydra* is a fresh water cnidarian and *Physalia* is a marine cnidarian.

15. The name cnidaria has been derived from _____.

Sol. The name cnidaria is derived from the cells cnidoblasts or cnidocytes present on the tentacles and body of the animals of this phylum. These cells are present nowhere in any phylum and are characteristic feature of only this phylum.

16. Identify the animal illustrated in the figure given below. Which type of fertilisation and development takes place in it?

Sol. Given animal is *Pleurobrachia* which belongs to the phylum ctenophora. It is commonly called comb jelly. Fertilisation is external and development is indirect in *Pleurobrachia*. Larval stage is present.

17. Write two characteristic features of *Pleurobrachia* which are not present in *Hydra*.

Sol. **(i) Comb plates :** Eight external rows of ciliated comb plates, which help in locomotion of *Pleurobrachia*. Comb plates are not found in *Hydra*.

(ii) Bioluminescence, *i.e.*, the property to emit light and thus shine is present in *Pleurobrachia* but not in *Hydra*.

18. Why platyhelminthes are commonly called the flatworms?

Sol. The platyhelminthes have dorso-ventrally flattened body, which gives a flat look to their appearance. That is why they are commonly called the flatworms.

19. How important is the presence of hooks and suckers in the parasitic platyhelminthes?

Sol. Hooks and suckers are the **adhesive structures** present in parasitic platyhelminthes that help them to attach to the internal body surface of their hosts. Suckers also help in the sucking (ingesting) the food *e.g.*, in *Fasciola*.

20. What function does the muscular pharynx in the digestive tract of *Ascaris* perform?

Sol. The pharynx in *Ascaris* is muscular, *i.e.*, having muscle tissue. This muscular pharynx acts like a suctorial organ which helps in sucking the blood and food from the body of host.

21. Is sexual dimorphism present in *Ascaris*? If yes, mention any one feature which shows the sexual dimorphism in them.

Sol. Yes, sexual dimorphism is present in the *Ascaris*. Males and females are distinguishable externally and are distinct. Often females are longer than males. Moreover, the tail end of male *Ascaris* is curved ventrally and of female *Ascaris* is straight.

22. What do you mean by closed circulatory system? Which animals were first to have closed circulatory system?

Sol. The circulatory system is said to be closed when the blood circulates through a series of blood vessels of varying diameters (arteries, veins and capillaries). The body cells and tissues never come in the direct contact with the blood. Annelids were the first animals to have closed circulatory system.

23. Do annelids locomote? If yes, which structures help in locomotion of annelids?

Sol. Yes, the annelids locomote. They possess longitudinal and circular muscles in the body wall which help in locomotion. Aquatic annelids like *Nereis* possess lateral appendages called parapodia, which help in swimming.

24. The name arthropoda is derived from which feature of its animals?

Sol. All arthropods bear the jointed appendages in their body. The name arthropoda is derived from presence of this feature in all of the members of this phylum (arthros-joint, poda-appendages).

25. Name any three arthropods which are the vectors of disease causing microorganisms. Also, name the diseases they spread.

Sol. **(i)** ***Anopheles*** **:** *Anopheles* is a mosquito. Female *Anopheles* spreads the disease malaria.

(ii) ***Culex*** **:** *Culex* mosquito transmits the filariasis or elephantiasis.

(iii) ***Aedes*** **:** *Aedes* mosquito is a vector of dengue fever and yellow fever.

26. What is the function of shell in the body of molluscs? The shell is composed of which material?

Sol. Molluscs are the soft-bodied animals whose body remain enclosed within a calcareous shell which acts like an exoskeleton for these animals. This shell is made up of calcium carbonate. The hard calcareous shell provides the protection to the organism.

27. Mention two features of mollusca which are peculiar to it and not found elsewhere.

Sol. (i) Mantle

(ii) Radula

Mantle is a soft and spongy layer of skin formed over the visceral hump.

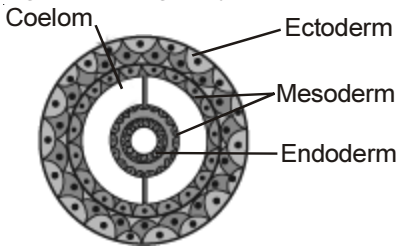
Radula is a file-like rasping organ present in the mouth.

28. Discuss the body symmetry of echinoderms.

Sol. The adult echinoderms have pentamerous radial symmetry. The body parts are arranged along five different axes and appear as if they are radiating from the centre of body. The larvae of echinoderms are bilaterally symmetrical which during the course of development give rise to radially symmetrical adults.

29. Give a brief account of the coelom of echinoderms with a neat diagram.

Sol. The echinoderms are the coelomate animals possessing true body cavity (coelom) lined with the mesoderm. This coelom contains the visceral organs and organ-systems.



30. Write a short note on *Balanoglossus*.

Sol. *Balanoglossus* is a worm-like, cylindrical, marine animal belonging to phylum Hemichordata. Its body is unsegmented and divided into proboscis, collar and trunk. It is dioecious and exhibits organ system level of organisation.

Long Answer Type Questions :

31. Write a descriptive note on the derivation of names of the following phyla :

    (a) Cnidaria

    (b) Annelida

    (c) Arthropoda

    (d) Mollusca

    (e) Echinodermata

Sol. (a) Name 'Cnidaria' is derived from the characteristic cells, cnidoblasts, also called cnidocytes. These are the stinging cells present only in the members of this phylum. These cells help in the anchorage, capture of prey and defense.

(b) The animals of phylum Annelida are metamerically segmented and their body surface is distinctly marked into segments called metameres. This feature gives the phylum its name Annelida (Latin, *annulus* : little ring).

(c) Name 'Arthropoda' (*arthros* - joint, *poda* - appendages) is derived on the basis of presence of jointed appendages in the body. Various appendages like legs, antennae etc bear joints.

(d) Mollusca includes the soft-bodied animals and its name was derived on the basis of this common feature of its animals.

(e) Echinodermata (*echinos* - spiny, *derma* - skin) includes the spiny skinned animals as they all possess a calcareous endoskeleton made up of calcareous ossicles. The name echinodermata is derived on the basis of presence of spiny skin in its animals, which bears calcareous spines.

32. What do you understand by metagenesis? Give one example of the animal showing metagenesis. Draw the diagrams, if required.

Sol. Metagenesis is also called alternation of generation. It is a feature of cnidarians. The cnidarians exhibit two basic body forms called polyp and medusa.

(a) Medusa (b) Polyp

Polyp is a sessile form which remains attached to the substratum. It is cylindrical in shape and has a tubular body with a mouth surrounded by tentacles at one end. Other end is blind and attached to the substratum. The polyps are concerned with the feeding and asexual reproduction.

Medusa is a free-swimming form which is not found attached with the substratum. It is umbrella-shaped and has marginal tentacles. Mouth is located on the lower concave surface. The medusae are concerned with the sexual reproduction.

Those cnidarians which exist in both forms, *i.e.*, polyp as well as medusa exhibit alternation of generation in which polyps produce medusae asexually and medusae form the polyps sexually *e.g.*, *Obelia*. This alternation of generations or life forms is called metagenesis.

33. Compare the habitats, digestive systems, excretory systems and reproductive systems of the following animals :

    (a) *Physalia* (b) *Nereis*

    (c) *Pila* (d) *Asterias*

    (e) *Balanoglossus*

Sol.

	Physalia	*Nereis*	*Pila*	*Asterias*	*Balanoglossus*
1. Habitat	It is a marine cnidarian.	It is a marine annelid.	It is a fresh water mollusc.	It is a marine animal (echinoderm).	It is a marine animal (hemichordate).
2. Digestive system	Incomplete	Complete	Complete	Complete	Complete
3. Excretory system	Specialised excretory structures are lacking in it and excretion takes place through diffusion by body surface.	Nephridia, the coiled tubules help in excretion as well as osmoregulation.	Feather-like gills present in the mantle cavity perform excretion. They also have kidneys for excretion.	Excretory system is absent. The excretion takes place by diffusion from coelomic fluid to outside.	Proboscis gland is the excretory organ.
4. Reproductive system	Dioecious colony, both males and females are present in the colony.	Dioecious, sexes are separate. Fertilisation of gametes is external.	Dioecious, sexes are separate. Fertilisation is internal.	Dioecious, sexes are separate. Fertilisation is external.	Dioecious, sexes are separate. Fertilisation is external.

34. Identify the type of coelom shown in the given figure. Which term is used for the organism that possessing it? Name the phylum/phyla exhibiting this type of coelom and give five features of the phylum possessing it.

Sol. Given figure represents the **pseudocoelom**. It is a type of coelom in which the body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. The animals possessing it are called pseudocoelomates. Aschelminthes are the pseudocoelomates.

Characteristic features of Aschelminthes :

(i) These have organ-system level of organisation.

(ii) They are bilaterally symmetrical, triploblastic animals.

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

(iv) An excretory tube removes body wastes from the body cavity through the excretory pore.

(v) Sexes are separate (dioecious), *i.e.*, males and females are distinct. Often females are longer than males.

35. Explain the following systems :

(a) Water-vascular system (b) Canal system

Sol. (a) Water vascular system : It is the most distinctive feature of **echinoderms**. This system consists of a perforated plate madreporite, various types of canals like stone canal, ring canals, radial canals and lateral canals which finally terminate in the tube-like structures called tube feet. Sea water enters through madreporite and is circulated in the body through this system. The most important role of this system is to help in locomotion of echinoderms. Other functions performed by this system are capture and transport of food and respiration.

(b) Canal system : Canal system is a characteristic feature of the sponges. It is also called the water transport system. The body wall of sponges is perforated with minute pores called ostia which permit the entry of water. This water brings the food, respiratory gases and reproductive elements with it. The ostia may open directly or through canals into the central cavity of body called spongocoel, from where it goes out through the osculum. This system maintains a constant flow of water helping in the food gathering, respiratory exchange and removal of waste.

36. What do you understand by the term body symmetry? Differentiate the animals on the basis of symmetry.

Sol. Body symmetry can be defined as the similarity of body parts in different regions and directions. Animals can be classified on the basis of their symmetry into following three types :

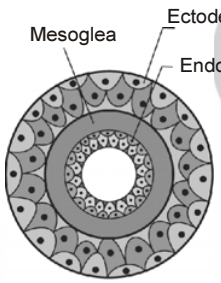
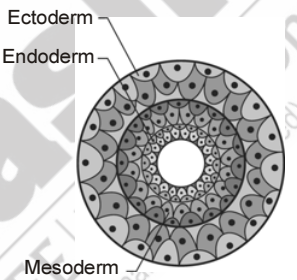
(i) Asymmetric : These animals whose body cannot be divided into equal halves by any plane passing through the centre of body are said to be asymmetric animals, *e.g.*, sponges.

(ii) Radially symmetric : Those animals whose body can be divided into two identical halves by any plane passing through the central axis of the body are said to be radially symmetric animals, *e.g.*, coelenterates, ctenophores and adult echinoderms.

(iii) Bilaterally symmetric : Those animals whose body can be divided into identical left and right halves in only one plane are said to be bilaterally symmetric animals, *e.g.*, platyhelminthes, aschelminthes, annelids, arthropods, larval echinoderms, hemichordates and chordates.

37. Differentiate between diploblastic and triploblastic organisation.

Sol.

Diploblastic organisation	Triploblastic organisation
1. The type of arrangement in which the body cells are arranged in two embryonic (germinal) layers, an external ectoderm and an internal endoderm. 	1. The type of arrangement in which the body cells are arranged in three embryonic (germinal) layers, outer ectoderm, middle mesoderm and inner endoderm. 
2. An undifferentiated layer, mesoglea is present in between the ectoderm and the endoderm.	2. Mesoglea is not present between the ectoderm and the endoderm. Mesoderm is present in between them.
3. The body structures originate from only two germinal layers.	3. The body organs originate from all the three germinal layers.
4. The animals possessing this organisation are called **diploblastic animals**.	4. The animals possessing this organisation are called **triploblastic animals**.
5. This type of organisation is exhibited by lower animals such as coelenterates and ctenophores.	5. This type of organisation is exhibited by higher animals, from platyhelminthes to chordates.

38. Write down one distinctive feature of each of the following phyla :

(a) Porifera

(b) Ctenophora

(c) Aschelminthes

(d) Annelida

(e) Echinodermata

Sol. (a) Porifera : One of the distinctive feature of this animal phylum is the presence of characteristic **flagellated choanocytes**, also called collar cells. These cells line the body canals and spongocoel which help in the propulsion of water through the beating of their flagella.

(b) Ctenophora : Presence of **ciliated comb plates** is one of the distinctive feature of ctenophora. The body of animals of this phylum bears eight external rows of ciliated comb plates which help in their locomotion. The cilia present on these comb plates are responsible for the locomotion.

(c) Aschelminthes : Presence of **pseudocoelom** is one of the distinctive feature of Aschelminthes, that is why, they are called the pseudocoelomates. The body cavity present between the body wall and the gut wall is not lined by the mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm.

(d) Annelida : Presence of **metameric segmentation** is one of the distinctive feature of Annelida. The external and internal segmentations correspond with each other. Internally a serial repetition of at least some organs is seen in the body segments.

(e) Echinodermata : Presence of **water vascular system** is one of the distinctive feature of Echinodermata. This system of canals helps in the locomotion, respiration, capture and transport of food.

39. Mention the functions of following :

(a) Spongocoel (b) Muscular pharynx

(c) Malpighian tubules (d) Tentacles

(e) Proboscis gland

Sol. (a) Spongocoel : This is the name given to the single central cavity of body of sponges. Water enters through ostia into the **spongocoel**, from where it goes out through osculum. This pathway of water transport is helpful in food gathering, respectively gas exchange and removal of waste.

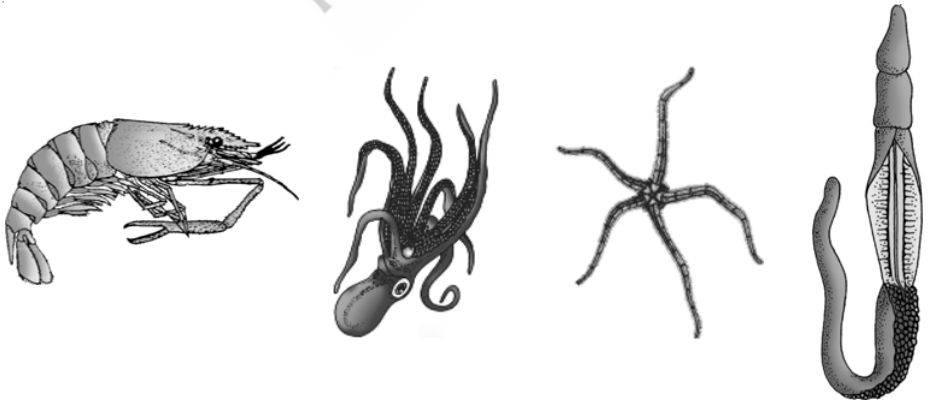
(b) Muscular pharynx : Aschelminthes possess a muscular pharynx in their digestive tract which acts as a suctorial organ for sucking the food from the body of hosts.

(c) Malpighian tubules : These are the blind tube-like structures present in arthropods. These are the excretory structures which collect the body waste from coelomic fluid and excrete it out along with the faeces.

(d) Tentacles : Tentacles are the elongated flexible structures. These are possessed by coelenterates, ctenophores and molluscs. Usually they help in feeding, feeling and grasping. In coelenterates, tentacles bear the characteristic stinging cells cnidoblasts which help in food capture, anchorage and defense. In ctenophores also tentacles help in capturing the prey. In molluscs, these more or less act as sensory structures and bear the receptors for sensation of touch. These are also used to capture the prey in them.

(e) Proboscis gland : It is the excretory organ in hemichordates which removes the metabolic waste out of body by collecting it from the blood coming to it.

40. Identify the animals given below and write a note on the body form of these animals.



(a) (b) (c) (d)

Sol. (a) Given animal is Prawn. It belongs to the largest phylum of animal kingdom, *i.e.*, Arthropoda. It has a bilaterally symmetrical, segmented body. Its body is covered by chitinous exoskeleton. Body bears the jointed appendages.

(b) Given animal is *Octopus* (Devil fish) which is a mollusc. It has a bilaterally symmetrical, unsegmented body.

(c) Given animal is *Ophiura* (Brittle star) which is an echinoderm. It has a radially symmetrical, unsegmented body which has body parts arranged in five axes (pentamerous). The body is spiny due to the presence of an endoskeleton of calcareous ossicles embedded in the skin.

(d) Given animal is *Balanoglossus* (Tongue worm) which is a hemichordate. It has a bilaterally symmetrical, unsegmented, cylindrical body which is divided into anterior proboscis, middle collar and posterior trunk.

41. Write a note on the following, giving suitable examples of each of them.

(a) Complete digestive system (b) External fertilisation

(c) Regeneration (d) Exoskeleton

Sol. (a) Complete digestive system : Digestive system is said to be complete when the alimentary canal is a complete tube extending from mouth at one end to anus on the other end of body. Mouth is the opening for the entry of food and anus is the opening for the exit of waste material. Hence there are two separate openings for entry of food and exit of waste. Aschelminthes to chordates, all possess complete digestive system.

(b) External fertilisation : Fertilisation is the fusion of male and female gametes (sperms and ova). Fertilisation is said to be external when fusion takes place outside the genital tract of female in the surrounding environment (like water). Sperms are the motile cells which swim towards the egg (ovum) and fertilise it resulting in the formation of a diploid zygote. This type of fertilisation is exhibited by ctenophores, some molluscs, echinoderms and hemichordates.

(c) Regeneration : Regeneration is the ability of an organism to replace its lost or damaged body parts. The lost or damaged body parts are regenerated by multiplication of cells. However, it cannot be taken as a normal mode of reproduction because it usually occurs after an accident or injury which results in the damage and the organism regenerates that part to compensate the loss. *Hydra*, *Planaria*, Star fish show good power of regeneration.

(d) Exoskeleton : Exoskeleton is the external skeleton that supports and protects an animal's body. The exoskeletons also provide the hardness to the body. Many animals have the protective exoskeletons. For example, corals, arthropods and molluscs. Corals have an exoskeleton of calcium carbonate, arthropods have a chitinous exoskeleton and molluscs have an exoskeleton in the form of a calcareous shell. The internal body organs of animals are provided protection with the help of exoskeleton. Since exoskeletons are rigid, they present some limits to growth. The animal can shed the old exoskeleton and grow new one, it is called moulting (*e.g.,* arthropods).

42. Answer the following questions for : (a) *Sycon* (b) *Pheretima* (c) *Sepia*

(i) Write their common names.

(ii) The phylum to which they belong.

(iii) Type of digestive system they possess.

(iv) Type of fertilisation they undergo.

(v) Type of development they undergo.

Sol. (a) *Sycon* :

(i) **Common name :** Crown sponge/ Urn sponge.

(ii) **Phylum :** Porifera

(iii) **Digestive system :** It does not possess a digestive system. It is a sponge and exhibits cellular level of organisation. Organ-systems are not formed in sponges. Digestion in sponges is intracellular, occurs in choanocytes and phagocytes not in spongocoel.

(iv) **Fertilisation :** Fertilisation is internal. The fusion of sperms and ova takes place inside the body of animal.

(v) **Development :** Development is indirect. A larval stage is present which is morphologically distinct from the adult.

(b) ***Pheretima*** **:**

(i) **Common name :** Earthworm

(ii) **Phylum :** Annelida

(iii) **Digestive system :** Complete digestive system is present which bears two separate openings mouth and anus.

(iv) **Fertilisation :** Fertilisation is external in earthworm.

(v) **Development :** Development is direct, *i.e.*, no larva is formed in the life history of earthworm.

(c) ***Sepia*** **:**

(i) **Common name :** Cuttlefish

(ii) **Phylum :** Mollusca

(iii) **Digestive system :** Digestive system is complete with a characteristic rasping organ radula for feeding.

(iv) **Fertilisation :** Fertilisation is internal; the fusion of sperms and ova takes place inside the female genital tract.

(v) **Development :** Development is direct with no intervening larval stage.

43. Give description of :

(a) Three economically important insects and their products.

(b) Three harmful insects and explain how they are harmful to man.

Sol. (a) Economically important insects :

(i) ***Apis*** **or honey bee :** It provides honey and bee wax. Honey is an important product of this insect which has many medicinal properties as it is rich in many minerals. It acts as a blood purifier. It is also used as food and serves as a good source of energy. Bees wax is used in making cosmetics, paints etc.

(ii) ***Bombyx*** **or silkworm :** It provides an important product, *i.e.*, silk. Silkworm is also called "Resham kaa keeda". The raw silk provided by this insect is then purified and woven to make silk sarees, kurtas, curtains etc.

(iii) ***Laccifer*** **or lac insect :** It produces a resinous secretion lac which is used as a sealing wax in making bangles, toys, dyes etc.

(b) Harmful insects :

(i) ***Locusta*** **or locust :** Locusts cause a heavy damage to the crops. They are the gregarious pests, which migrate in groups from one place to another and feed upon leafy vegetation, grasslands and crops thereby causing their damage.

(ii) ***Anopheles*** **(mosquito) :** It is very harmful to man in the sense that it is a vector of deadly disease malaria which is caused by a protozoan. Female *Anopheles* feeds on blood of man and other animals and transmits the protozoan by its bite.

(iii) ***Culex*** **(mosquito) :** *Culex* mosquito spreads elephantiasis or filariasis which is caused by a parasitic aschelminth *Wuchereria*. Filariasis is also a deadly disease like malaria and is characterised by the obstructions in the lymph drainage.

44. Give an explanatory note on the following :
    (a) Reproductive system of sponges
    (b) Digestive system in aschelminthes
    (c) Sensory organs in arthropods
    (d) Circulatory system in echinoderms

Sol. (a) Reproductive system in sponges : Sponges reproduce asexually as well as sexually. Sexes are not separate in them hence they are hermaphrodite or monoecious. Eggs and sperms are produced by the same individual which fertilise inside the body of sponge. Hence, fertilisation is internal. Development is indirect having a larval stage which is morphologically distinct from the adult. Asexual reproduction takes place by fragmentation.

(b) Digestive system in aschelminthes : Alimentary canal is complete having two openings, mouth and anus. The digestive tract has a well-developed muscular pharynx. This muscular pharynx helps in sucking the food. The digestion of food takes place extracellularly in the digestive cavity outside the cells.

(c) Sensory organs in arthropods : Arthropods have well-developed sensory organs which provide them the information of their surroundings. Antennae have the receptors for the sensation of touch and smell. Simple and compound eyes perceive the intensity of light and statocysts are the balance organs and help in maintaining the body equilibrium.

(d) Circulatory system in echinoderms : Blood vascular system is not well developed in echinoderms. Water vascular system helps in the transport of food and other materials with the help of canals. The water flowing through this system acts as the transport medium.

45. Write down eight characteristic features of the phylum Annelida and also give its two examples.

Sol. Characteristic features of phylum Annelida :

(i) They may be aquatic (marine and fresh water) or terrestrial.
(ii) They are the free-living animals but some are parasitic.
(iii) They exhibit organ-system level of organisation and bilateral symmetry.
(iv) They are triploblastic, metamerically segmented and coelomate animals.
(v) They possess circular and longitudinal muscles which help in locomotion.
(vi) Nephridia help in osmoregulation and excretion.
(vii) Nervous system consists of paired ganglia connected by lateral nerves to a double ventral nerve cord.
(viii) A closed circulatory system is present.

Examples : (i) *Pheretima* - Earthworm
(ii) *Hirudinaria* - Blood sucking leech

SECTION - B

Model Test Paper

Very Short Answer Type Questions :

1. Which cells line the spongocoel?

Sol. Choanocytes (collar cells).

2. Which body form in Cnidarian is umbrella-shaped and free-swimming?

Sol. Medusa

3. Define endoparasites.

Sol. Those living organisms that live inside the body of their hosts to obtain nutrition and protection from them are called endoparasites.

4. Which level of organisation is present in the roundworms?

Sol. Organ-system level of organisation.

5. Mention the term given to the body segments of earthworm.

Sol. Metameres

6. What are statocysts?

Sol. **Balance organs**, found in some animals.

7. Is segmentation present in the body of molluscs? If yes, name the type of segmentation.

Sol. They have an **unsegmented body**. So no segmentation is present in them.

8. Which is the most distinctive feature of Echinoderms?

Sol. Presence of **water vascular system**.

Short Answer Type Questions :

9. Define diploblastic organisation and give one example of diploblastic animal.

Sol. The organisation in which the cells are arranged in two embryonic layers, an external ectoderm and an internal endoderm with an undifferentiated layer mesoglea in between these two layers is called diploblastic organisation. *e.g.*, *Hydra*.

10. Define metamerism. Give an example of metamerism in animals.

Sol. Metamerism is the phenomenon of occurrence of metameric segmentation in some animals in which the body is externally as well as internally divided with a serial repetition of at least some organs in these segments. True metamerism is seen in Annelids.

11. Explain the canal system of sponges in brief.

Sol. It is a distinguishing feature of all sponges in which the body wall is perforated by numerous pores called ostia meant for the entry of water current which then enters in the central cavity called spongocoel. From spongocoel the water exits out through the osculum. This system comprising ostia, canals, spongocoel and osculum forms the canal system of sponges and helps in food gathering, respiratory exchange and reproduction.

12. What is the function of comb plates in *Pleurobrachia* and also give their number in its body?

Sol. The comb plates help in the locomotion of *Pleurobrachia*. These comb plates are eight in number and present on the external surface of body. The cilia present on these comb plates help in the swimming as *Pleurobrachia* is an aquatic animal.

13. Name different respiratory structures in the Arthropods.

Sol. (i) Gills (ii) Book gills
(iii) Book lungs (iv) Tracheal system

14. What do you understand by metagenesis? In which animals metagenesis is observed?

Sol. The alternation of generations, especially regular alternation of sexual and asexual phases in the life history of an organism is called metagenesis. It is a phenomenon whereby, in the life-history of an organism, asexual form produces sexual form and sexual forms produce asexual forms. Metagenesis is observed in the phylum **Coelenterata** in which polyps (asexual forms) produce medusae (sexual forms) asexually and medusae form polyps sexually.

15. Differentiate between open and closed type of circulatory systems.

Sol.

Open circulatory system	Closed circulatory system
1. In this system, the blood pumped by heart flows in the open sinuses (spaces) in the body.	1. In this system, the blood pumped by heart flows inside the vessels of varying diameters (arteries, veins and capillaries).
2. The body cells and tissues are in direct contact with the blood and are bathed in it.	2. The body cells and tissues are not bathed in blood hence not in the direct contact with blood.

Short Answer Type Questions :

16. Categorise the following animals on the basis of their body symmetry and place them in their respective phyla.
(a) *Nereis* (b) *Loligo* (c) *Physalia*

Sol.

S.No.	Name of animal	Type of Body symmetry	Name of phylum
1.	*Nereis*	Bilateral symmetry	Annelida
2.	*Loligo*	Bilateral symmetry	Mollusca
3.	*Physalia*	Radial symmetry	Coelenterata

17. Give three comments on the reproductive system and mode of reproduction in Aschelminthes.

Sol. (i) The sexes are separate, *i.e.*, males and females are distinct. Hence, aschelminthes are dioecious. Often females are longer than males.

(ii) Internal fertilisation is present, *i.e.*, the fusion of sperms and ova takes place inside the body of female.

(iii) The development is direct in some and indirect in others hence both types of development are found in the animals of this phylum.

18. Comment upon the various habitats of arthropods with examples.

Sol. Arthropods form the largest phylum of the animal kingdom. They are found in almost all habitats on the earth, some are aquatic (marine or fresh water), some are terrestrial and even some have adapted to fly also. Following are the examples of arthropods living in different habitats :

(a) Aquatic :

(i) Marine *e.g. Limulus*, lobsters etc.

(ii) Fresh water *e.g. Daphnia* (water flea) etc.

(b) Terrestrial : Scorpions, cockroaches, grasshopper or locust etc.

(c) Aerial : Mosquitoes, houseflies, butterflies etc.

Some arthropods are even ectoparasites, *i.e.*, they live on the body surface of their hosts, *e.g.*, Ticks and mites.

19. Write any three characteristic features of members of Phylum Mollusca.

Sol. (i) Molluscs have a bilaterally symmetrical body with an organ-system level of organisation.

(ii) Body is unsegmented and covered by a calcareous shell in them.

(iii) Feather-like gills perform the respiration as well as excretion in their body.

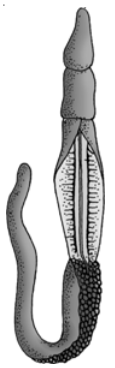
20. Give two examples of each : Echinodermata, Hemichordata and Mollusca.

Sol. Echinodermata : *Asterias*, *Echinus*

Hemichordata : *Balanoglossus*, *Saccoglossus*

Mollusca : *Pila*, *Octopus*

21. Identify the following animal and comment on its circulatory and respiratory system.



Sol. The given animal is *Balanoglossus* which is a hemichordate. It has an open circulatory system. The blood is colourless containing few white blood cells and flows in the open spaces in the body. Respiration takes place through gills which exchange the oxygen dissolved in water with the carbon dioxide of blood.

Long Answer Type Questions :

22. Mention the functions of the following structures :
    (a) Parapodia
    (b) Nephridia
    (c) Comb plates
    (d) Radula
    (e) Suckers

OR

Enumerate the five important characteristic features of phylum Echinodermata.

Sol. (a) Parapodia : These are the lateral appendages found in body of *Nereis* (and some other annelids) which help in the swimming of these aquatic annelids.

(b) Nephridia : These are the excretory organs which remove metabolic waste (excretion) as well as maintain salt and water concentration (osmoregulation) in the body of animal. *e.g.* Annelids.

(c) Comb plates : These are the locomotory structures present on the external body surface of ctenophores. These are ciliated and present in eight rows.

(d) Radula : This is a file-like rasping organ present in the mouth of molluscs. It is used for feeding.

(e) Suckers : These are present in the parasites for adhesion (to the body of hosts) as well as ingestion of food as in *Fasciola*.

OR

Five important characteristic features of phylum Echinodermata :

(i) The animals of this phylum are marine with organ-system level of organisation.

(ii) The adult echinoderms are radially symmetrical but their larvae are bilaterally symmetrical.

(iii) They have a complete digestive system with mouth on the ventral side and anus on the dorsal side.

(iv) The most distinctive feature is the presence of water vascular system which helps in locomotion, capture and transport of food and respiration.

(v) Sexes are separate, fertilisation is usually external and development is indirect with free-swimming larva.

23. (a) Which level of organisation is present in the following animals?
    (i) *Euspongia*
    (ii) *Pennatula*
    (iii) *Wuchereria*
    (iv) *Pheretima*

    (b) Write a short note on choanocytes.

OR

(a) Classify the animals on the basis of body symmetry.

(b) Write a short note on flame cells.

Sol. (a) **Level of organisation :**
    (i) *Euspongia* : Cellular level
    (ii) *Pennatula* : Tissue level
    (iii) *Wuchereria* : Organ-system level
    (iv) *Pheretima* : Organ-system level

(b) Choanocytes are also known as collar cells. These are present in the sponges. These cells line the central cavity of their body, *i.e.*, spongocoel and other body canals. These are the flagellated cells which help in generating a continuous current of water from pores to the spongocoel and then out through the osculum.

As these cells help in maintaining the continuous flow of water, they eventually help in the digestion (especially ingestion), respiration, excretion and reproduction of sponges.

OR

(a) On the basis of body symmetry, animals can be classified as :

(i) **Asymmetric :** Those animals whose body cannot be divided into two equal halves by any plane passing through the centre of body, *e.g.*, most of *sponges*.

(ii) **Radially symmetric :** Those animals whose body can be divided into two equal halves by any plane passing through the central axis of body, *e.g.*, *Hydra*.

(iii) **Bilaterally symmetric :** Those animals whose body can be divided into two identical left and right halves in only one plane, *e.g.*, Human beings, *Ascaris*.

(b) Flame cells are the specialised excretory cells found in flatworms. These function like kidneys as they perform excretion and osmoregulation. These cells have cilia and the beating of cilia gives the appearance of a flame, that is why these cells are known as flame cells. These remove out the nitrogenous waste from body and maintain the salt-water concentration of body fluids.

❑ ❑ ❑

Solutions (Set-2)

Objective Type Questions

(Metazoa, Basis of Classification)

1. Which of the following statements is **not** true?
   (1) All members of kingdom Animalia are multicellular
   (2) Nature of coelom is used as one of the basis of animal classification
   (3) There is no need of classification now as over a million species of animals have been described till now
   (4) The arrangement of cells in the body is one of the classifying feature of the animals

Sol. Answer (3)

In kingdom animalia, till now over a million species have been described. Animalia is largest kingdom, with over 1.2 million members. Due to such large number of member species, the need for classification becomes more important.

2. The only **incorrectly** matched pair is

	Phylum		**Level of organisation**
(1)	Porifera	–	Cellular level
(2)	Cnidaria	–	Tissue level
(3)	Annelida	–	Organ level only
(4)	Mollusca	–	Organ system level

Sol. Answer (3)

(1)	Porifera	–	Cellular level
(2)	Cnidaria	–	Tissue level
(3)	Annelida	–	Organ-system level
(4)	Mollusca	–	Organ-system level

3. A complete digestive system has
   (1) Single opening that serves as both mouth and anus
   (2) Two openings, one as mouth and other as anus
   (3) Single opening that acts as mouth only
   (4) Two openings, both act as mouth as well as anus

Sol. Answer (2)

Digestive tract with two openings, mouth for ingestion and anus for egestion is known as complete digestive system.

4. In closed circulatory system
   (1) The cells and tissues are directly bathed in the blood pumped out by heart
   (2) Arteries and veins are lacking
   (3) The capillaries are largest blood vessels and closed at their ends
   (4) Blood circulates through a series of vessels of varying diameters

Sol. Answer (4)

Closed circulatory system is a type of blood vascular system in which blood flows inside blood vessels of varying diameter (arteries, veins, capillaries) without coming in direct contact with body cells. Closed circulatory system is observed in annelids, cephalopod molluscs, chordates.

5. Which of the following fundamental feature is common to *Balanoglossus*, *Anopheles* and *Laccifer* without any exception?

(1) Marine habitat (2) Members of largest phylum of animal kingdom

(3) Open circulatory system (4) External fertilisation

Sol. Answer (3)

Balanoglossus – Belongs to phylum Hemichordata.

Anopheles – Belongs to phylum Arthropoda

Laccifer – Belongs to phylum Arthropoda

Both Hemichordate and Arthropoda have open circulatory system, without any exception.

6. Match the animals in Column-I with their common names in Column-II

	Column-I		**Column-II**
a.	*Limulus*	(i)	Tusk shell
b.	*Ophiura*	(ii)	Tapeworm
c.	*Taenia*	(iii)	Brain coral
d.	*Meandrina*	(iv)	King crab
e.	*Dentalium*	(v)	Brittle star

(1) a(v), b(iv), c(ii), d(iii), e(i) (2) a(iv), b(v), c(ii), d(iii), e(i)

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

Sol. Answer (2)

a.	*Limulus*	–	King crab	–	Living fossil
b.	*Ophiura*	–	Brittle star	–	Phylum Echinodermata
c.	*Taenia*	–	Tapeworm	–	Phylum Platyhelminthes
d.	*Meandrina*	–	Brain coral	–	Class Anthozoa, Phylum – Cnidaria
e.	*Dentalium*	–	Tusk shell	–	Class Scaphopoda, Phylum – Mollusca

(Classification of Animals)

[Phylum : Porifera]

7. Mesoglea is

(1) A germinal layer present between ectoderm and endoderm

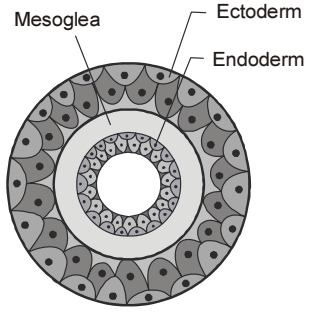
(2) An undifferentiated layer present between ectoderm and endoderm

(3) Another name of mesoderm

(4) A spongy layer of skin

Sol. Answer (2)

In diploblastic animals, developing embryo has only two germinal layers *i.e.* external ectoderm and internal endoderm. Mesoderm layer is not present between ectoderm and endoderm but an undifferentiated, jelly like layer is present between them. This undifferentiated layer is called Mesoglea.



Germinal layers in diploblastic animals

8. The pecularity of sponges is presence of

(1) Canal system (2) Water vascular system

(3) Central gastro vascular cavity (4) Bioluminescence

Sol. Answer (1)

Canal system is peculiar property of sponges where canal system is a system of interconnected chambers, canals and their openings.

Also water vascular system is peculiar property of Echinoderms. Central gastrovascular cavity is property of cnidarians. Bioluminescence is property of ctenophora.

9. Choanocytes are present in

(1) *Physalia* (2) *Sycon* (3) *Pleurobrachia* (4) *Echinus*

Sol. Answer (2)

Choanocytes or collar cells are characteristic cells of porifers/sponges. In sponges, canal and spongocoel are internally lined by choanocytes.

In options, *Physalia* belongs to cnidaria/coelenterata. *Sycon* belongs to porifera/sponges.

Pleurobrachia belongs to ctenophora.

Echinus is a sea-urchins and belongs to Echinodermata.

10. In Poriferans, the skeleton is made up of

(1) Spongin fibres and spicules (2) Calcareous ossicles

(3) Chitinous spicules (4) Cartilage

Sol. Answer (1)

In porifera skeleton is made by two types of cells.

- ❖ Scleroblast : They secrete spicules. In calcareous sponges, they are called calcoblast and in silicious sponges, they are called silicoblast.
- ❖ Spongioblast : They secrete spongin fibre of mesohyal layer in sponges.

11. Water enters the body of sponges through

(1) Osculum (2) Hypostome (3) Muscular pharynx (4) Ostia

Sol. Answer (4)

Sponges are also called as porifera, means pore bearing animals. Sponges have perforated body with numerous opening called ostia. Through ostia water enters inside sponges.

A larger opening through which water flows out of sponge is called osculum. So porifera have enumerate mouth like pore called ostia for entry of water and single large pore for exit of water called osculum.

12. All of the following statements are **correct** for Poriferans, **except**

(1) Eggs and sperms are produced by the same individual

(2) They are generally marine and mostly asymmetrical animals

(3) They reproduce sexually as well as asexually

(4) They exhibit extracellular type of digestion

Sol. Answer (4)

Sponges are hermaphrodite *i.e.* male and female gamete is produced by same individual. Most of sponges are marine and asymmetric animals. Both sexual and asexual reproduction occur in them.

Sponges have intracellular digestion as food is digested with in food vacuoles inside the cells. There is no extracellular digestion in sponges.

[Phylum : Coelenterata]

13. Which of the following is **not** a function of cnidoblasts?

(1) Digestion of food (2) Anchorage (3) Defense (4) Capture of prey

Sol. Answer (1)

Cnidoblast are stinging cells of phylum cnidaria/ctenophora. Projecting cnidoblast act as organ for offence and defense.

- ❖ Cnidoblast help in capturing the prey by coiling around the prey.
- ❖ Cnidoblast protect cnidarian by either paralyzing or killing other animal with help of toxin and spines.
- ❖ Cnidoblast secrete sticky substances which provide anchorage for locomotion.

14. Coelenterates are

(1) Asymmetric animals (2) Radially symmetric animals

(3) Bilaterally symmetric animals (4) Spherically symmetric animals

Sol. Answer (2)

Coelenterates are radially symmetric animals. In radially symmetric animals any plane passing through centre, divide organism in two identical halves.

15. Digestion in coelenterates is

(1) Only intracellular (2) Only extracellular

(3) Both extracellular and intracellular (4) Not required

Sol. Answer (3)

Digestion is both extracellular as well as intracellular in cnidaria. Firstly there is extracellular digestion in gastrovascular cavity and then intracellular digestion involving gastrodermal muscular endothelial cells.

16. Metagenesis can be seen in

(1) *Adamsia* (2) *Hydra* (3) *Physalia* (4) *Meandrina*

Sol. Answer (3)

Metagenesis (alteration of generation), where cnidarians exist in both forms of life *i.e.*, cylindrical, sessile polyp form and umbrella shaped free-swimming medusa form.

e.g. *Obelia*, *Physalia*

Obelia and *Physalia* belong to class hydrozoa.

17. Which of the following is **not** a characteristic feature of cnidarians?

(1) They exhibit tissue level of organisation (2) They may be aquatic or terrestrial

(3) They may be sessile or free-swimming (4) They are diploblastic animals

Sol. Answer (2)

All cnidarians possess aquatic habitat. They are not terrestrial animals.

[Phylum : Ctenophora]

18. Comb jellies are _____ and jelly fishes are _____ respectively.

(1) Echinoderms, Ctenophores (2) Ctenophores, Echinoderms

(3) Ctenophores, Cnidarians (4) Cnidarians, Echinoderms

Sol. Answer (3)

Comb jellies belong to phylum ctenophora. Comb jellies bear eight median comb plates. These comb plates bear cillia which fuses to form ciliated plates, giving them comb like appearance.

Jelly fishes belong to phylum cnidaria.

19. The ciliated comb plates in *Pleurobrachia* are meant for

(1) Reproduction (2) Digestion (3) Protection (4) Locomotion

Sol. Answer (4)

Pleurobrachia (Sea gooseberry) belongs to phylum ctenophora. Ctenophores bear eight median comb plates. These comb plates bear cilia which are fused to make these plates ciliated. The ciliated comb plates help in locomotion.

20. *Ctenoplana* belongs to a group of animals which are best described as

(1) Unicellular with tissue level of organisation

(2) Multicellular with radially symmetrical body

(3) Multicellular with organ level of organisation

(4) Unicellular with bilaterally symmetrical bodies

Sol. Answer (2)

Ctenoplana belong to phylum ctenophora. Ctenophores are multicellular animals, which are radially symmetric and have tissue level of organization.

21. Bioluminescence is well-marked in members of which of the following phyla?

(1) Ctenophora (2) Mollusca

(3) Hemichordata (4) Annelida

Sol. Answer (1)

Bioluminescence is property of production and emission of light by a living organism.

This property is well maked in ctenophores. Most ctenophores emit light by special light producing cells called photocytes.

[Phylum : Platyhelminthes, Aschelminthes]

22. Which specialised cells are present for excretion in the phylum platyhelminthes?

(1) Collar cells (2) Cnidoblasts

(3) Flame cells (4) Nematocytes

Sol. Answer (3)

Flame cells are specialised cells of platyhelminthes which help in excretion as well as osmoregulation. Flame cells are named so, because of their flickering flame like appearance. Flame cells are also called protonephridia.

23. High regeneration capacity is possessed by

(1) *Aurelia* (2) *Pheretima*

(3) *Bombyx* (4) *Planaria*

Sol. Answer (4)

Regeneration is ability of organism to replace its lost or damaged part or ability to develop complete and normal individual from a part of body. *Planaria* (*Dugesia*) have high regeneration power.

24. The aschelminthes are commonly called roundworms because

(1) They have a round body (2) Their body is circular in cross-section

(3) They have bilaterally symmetric body (4) Their body has a round visceral hump

Sol. Answer (2)

In aschelminthes body is commonly cylindrical and elongated, tapering at both ends. In a cross section, body appears round or circular. Because of this body form, the animals are called round worms.

25. All of the following are monoecious, **except**

(1) *Fasciola* (2) *Spongilla* (3) *Ascaris* (4) *Ctenoplana*

Sol. Answer (3)

Animals having both female and male sex organs in same organism are called monoecious, bisexual, hermaphrodite. *Spongilla* (fresh water sponge), ctenoplana (ctenophora) and *Fasciola* (liver fluke) are monoecious or bisexual organisms. *Ascaris* are dioecious (unisexual), where male and females are distinct or different from each other.

26. Hookworm is the common name of

(1) *Wuchereria* (2) *Ancylostoma* (3) *Taenia* (4) *Fasciola*

Sol. Answer (2)

Common name for *Wuchereria* is filarial worm

Common name for *Ancyclostoma* is hook worm

Common name for *Taenia soluim* is pork tapeworm

Common name for *Fasciola* is liver fluke

27. Mesoderm is present as scattered pouches in between the ectoderm and endoderm in

(1) Annelids (2) Echinoderms

(3) Molluscs (4) Aschelminthes

Sol. Answer (4)

Aschelminthes are pseudocoelomate where body cavity is present but it is not completely lined by mesoderm, but mesoderm is present as scattered pouches between ectoderm and endoderm.

28. In Aschelminthes the excretory tube removes body wastes from the body cavity through

(1) Excretory pore (2) Malpighian tubules

(3) Flame cells (4) Diffusion from body surface

Sol. Answer (1)

An excretory tube is present in aschelminthes, which removes body waste through excretory pore. This excretory tube collects body waste from body cavity and removes it out through excretory pore.

29. The only phylum bearing pseudocoelom is

(1) Annelida (2) Porifera

(3) Aschelminthes (4) Platyhelminthes

Sol. Answer (3)

Only phylum aschelminthes are pseudocoelomate animals where body cavity is present but it is not completely lined by mesoderm, but mesoderm is present as scattered pouches between ectoderm and endoderm.

30. *Ascaris* has all of the following features, **except**

(1) Complete digestive system (2) Indirect development

(3) External fertilisation (4) Parasitic life

Sol. Answer (3)

Ascaris belong to phylum Aschelminthes. *Ascaris* have complete oligestive system with two openings, mouth and anus. Development is indirect with rhabditoid or rhabditiform larvae.

Ascaris is common endoparasite in small intestine of man and undergo internal fertilisation only.

There is no external fertilisation in *Ascaris*.

[Phylum : Annelida]

31. Metameric segmentation is exhibited by which of the following animal?

(1) *Adamsia* (2) *Euspongia*

(3) *Ascaris* (4) *Pheretima*

Sol. Answer (4)

In metameric segmentation animal body is devided both externally and internally into distinct portions callled metameres or segments.

In annelida phylum both external and internal segmentation is present *i.e.* body of annelids is metamerically segmented.

Pheretima commonly called earthworm is are annelid belonging to class oligochaeta.

32. _____ in the earthworm perform the function similar to flame cells in *Taenia*.

(1) Parapodia (2) Nephridia

(3) Metameres (4) Ganglia

Sol. Answer (2)

As *Taenia* (platyhelminthes) have specialized flame cells for excretion, similarly earthworm have coiled specialized cells called nephridia for excretion of wastes

33. Notochord in earthworm is _____ and nerve cord is _____.

(1) Dorsal, Ventral (2) Absent, Ventral

(3) Ventral, absent (4) Absent, Dorsal

Sol. Answer (2)

Notochord is a supporting structure, part of internal skeleton found only in chordates.

Nervecord is part of nervous system, mesodermal in origin and is found in both chordates and non-chordates. Notochord is formed on dorsal side in chordate while nerve cord is ventral in non-chordates and dorsal in chordates.

Earthworm belong to phylum annelid, *i.e.* non-chordate. So earthworm does not have notochord and nerve cord is ventral in position.

34. The body segments in earthworm are called

(1) Comb plates (2) Spicules

(3) Metameres (4) Ganglia

Sol. Answer (3)

Earthworm (Annelid) have metamerically segmented body, where body is externally and internally divided into segments. These repeated segments are called metameres or somites.

[Phylum : Arthropoda]

35. A chitinous exoskeleton is possessed by

(1) Annelids (2) Arthropods

(3) Molluscs (4) Echinoderms

Sol. Answer (2)

Arthropods possess exoskeleton of chitin reinforced with protein or calcium carbonate. Presence of chitin exoskeleton favours survival of arthropod in different environment and supports their universal occurrence.

36. Which function is served by the tracheal system in insects?

(1) Sensation (2) Respiration

(3) Both (1) & (2) (4) Digestion

Sol. Answer (2)

Various types of respiratory structures are present in different groups of arthropods.

Tracheal system is a network of air tubes which constitute main organ of respiration in many arthropods including insects.

37. Honey is the commercial product of which of the following animal?

(1) *Bombyx*

(2) *Laccifer*

(3) *Apis*

(4) *Aedes*

Sol. Answer (3)

Apis-honeybee, produces two main products honey and beewax. Honey is used as food as well as in medicines.

38. The statement which does **not** stand true for most arthropods is

(1) They have an open circulatory system

(2) Their body is divided into head, thorax and abdomen

(3) They are segmented and coelomate animals

(4) Fertilisation is usually external in them

Sol. Answer (4)

Arthropods have open circulatory system, possess true coelom and are schizocoelomate (body cavity is formed by splitting of mesoderm). Arthropods have segmented body, fertilisation is usually internal in Arthropods.

39. The phylum Arthropoda is named so because of presence of

(1) Jointed appendages

(2) Segmentation

(3) Chitinous exoskeleton

(4) Organ-system level of organisation

Sol. Answer (1)

Arthro means jointed and *Poda* means appendages.

So arthropoda have jointed appendages which is characteristic feature of all arthropods and gives the phylum its name.

40. Statocysts are the

(1) Lateral locomotory appendages in annelids

(2) Suckers present in parasitic platyhelminthes

(3) Balance organs in arthropods

(4) Stinging capsules in cnidarians

Sol. Answer (3)

Statocysts are the sense organs, which are meant for sense of balance in arthropods.

41. Match Column-I with Column-II and select the **correct** option

	Column-I		**Column-II**
a.	A vector of disease	(i)	*Bombyx*
b.	A gregarious pest	(ii)	*Limulus*
c.	A living fossil	(iii)	*Locusta*
d.	An economically beneficial insect	(iv)	*Culex*

(1) a(iii), b(ii), c(i), d(iv) (2) a(i), b(ii), c(iii), d(iv)

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

Sol. Answer (4)

a.	A vector of disease	–	*Culex* mosquito	– (Vector of filarial worm causes filariasis)
b.	A gregarious pest	–	*Locusta*	– (Live in group, but not help each other)
c.	A living fossil	–	*Limulus*	– *Limulus* (king crab or horse shoe crab)
d.	An economically	–	*Bombyx*	– Produces silk important insect

[Phylum : Mollusca]

42. Body of molluscs is

(1) Unsegmented

(2) Covered by a calcareous shell

(3) Divided into distinct head, muscular foot and visceral hump

(4) All of these

Sol. Answer (4)

Molluscs have unsegmented body, can be covered by shell made of calcium carbonate. Body of mollusc is normally divided into head, foot and visceral mass.

43. Which of the following structure helps in excretion and respiration in molluscs?

(1) Nephridia (2) Feather-like gills

(3) Flame cells (4) Tentacles

Sol. Answer (2)

The mantle cavity of molluscs, encloses feather like gills which help in respiration as well as excretion.

44. Precious pearls are obtained from which of the following animals?

(1) *Pinctada* (2) *Dentalium*

(3) *Sepia* (4) *Aplysia*

Sol. Answer (1)

Pinctada belonging to class Pelecypoda (Bivalvia) of phylum mollusca are famous for pearl formation.

Pinctada is also called as pearl oyster.

45. Radula is meant for

(1) Sensation (2) Feeding

(3) Egg laying (4) Protection from predators

Sol. Answer (2)

Mouth of molluscs contain file like rasping organ, with transverse rows of chitinous teeth, this is called radula. Radula is feeding or rasping organ in molluscs.

[Phylum : Echinodermata]

46. All of the following are echinoderms, **except**

(1) Sea lily

(2) Sea cucumber

(3) Sea hare

(4) Sea urchin

Sol. Answer (3)

Sea lily belong to crinoidea class of phylum echinodermata. Sea cucumber belong to holothuroidea class of phylum echinodermata.

Sea urchin belong to echinoidea class of phylum echinodermata. Sea hare is *Aplysia*, belong to class gastropoda of phylum mollusc.

47. The calcareous ossicles in echinoderms form the

(1) Exoskeleton

(2) Visceral hump

(3) Notochord

(4) Endoskeleton

Sol. Answer (4)

Echinoderms possess an endoskeleton (internal skeleton) of calcareous ossicles (small bones), embedded in skin. The endoskeleton is derived from mesoderm in echinodermates.

48. The larval stage in *Asterias* is

(a) Absent

(b) Free-swimming

(c) Bilaterally symmetrical

(d) Radially symmetrical

(1) Only (a)

(2) (b) & (c)

(3) (b) & (d)

(4) Only (c)

Sol. Answer (2)

Asterias is star fish, belong to phylum echinodermata. Echinoderms are free-living animals. Adult echinoderms are radially symmetric but larval forms are bilaterally symmetric in echinoderms.

49. The water vascular system in phylum echinodermata helps in

(1) Locomotion, capture and transport of food

(2) Excretion

(3) Respiration

(4) All of these

Sol. Answer (4)

Water vascular system is most distinctive feature of echinoderms.

Water vascular system in echinoderms perform function of locomotion, capture and transport of food, respiration as well as excretion.

50. Which organ system is lacking in the animals that bear water vascular system?

(1) Nervous system

(2) Excretory system

(3) Circulatory system

(4) Sensory system

Sol. Answer (2)

Water vascular system is characteristic feature of echinoderms. In echinoderms, specialised excretory system is absent. The excretory products diffuse out from the body tissue into coelomic fluid from where waste is eliminated out.

- **Phylum : Hemichordata**

51. Cylindrical bodied, worm-like exclusively marine animals belong to the phylum:

(1) Echinodermata (2) Mollusca

(3) Coelenterata (4) Hemichordata

Sol. Answer (4)

Hemichordates have soft, fragile worm like appearance. The body is cylindrical in shape and is divisible in three parts:

Proboscis, collar and trunk.

52. The body of hemichordates is divided into

(1) Head, muscular foot and visceral hump

(2) Head, thorax and abdomen

(3) Proboscis, collar and trunk

(4) Proboscis and trunk

Sol. Answer (3)

Body of hemichordate is divisible into proboscis, collar and trunk.

53. The phylum which was earlier considered as a sub-phylum under chordata but now placed as a separate phylum, in non-chordates is

(1) Urochordata (2) Hemichordata

(3) Cephalochordata (4) Vertebrata

Sol. Answer (2)

Name hemichordates literally means half chordates and act as link between chordate and non chordate.

Hemichordata was earlier considered as sub phylum under phylum chordata, but now it is placed as separate phylum under non-chordata.

54. Proboscis gland is a/an

(1) Endocrine organ (2) Excretory organ

(3) Feeding organ (4) Reproductive organ

Sol. Answer (2)

Excretion of nitrogenous waste in hemichordates takes place through proboscis gland. The gland collects waste from blood and pass it into coelom of proboscis from where it is excreted through proboscis pore, at anterior region of proboscis.

55. Which of the following set of animals belong to phylum hemichordata?

(1) *Balanoglossus*, *Saccoglossus*

(2) *Roundworm, Tougue worm*

(3) *Flat worm, Earthworm*

(4) *Dentalium*, *Chaetopleura*

Sol. Answer (1)

Balanoglossus (Tongue worm), *Saccoglossus* (Tongue worm) belong to phylum hemichordata.

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