# BIOLOGY

# Important Questions

## ➢ Multiple Choice Questions:

Question 1. Body cavity in arthoropods is

(a) Coelom

(b) Haemocoel

(c) Psuedocoel

(d) Coelenteron

Question 2. Digestion is sponges occur in

(a) Spongocoel

(b) Osculum

(c) Ostium

(d) Food Vacuoles

Question 3. Classification of Porifera is based on

(a) Branching

(b) Spicules (skeleton)

(c) Reproduction

(d) Symmetry

Question 4. Excretion in flatworms occurs by

(a) Nephridia

(b) Flame cells

(c) Malpighian tubules

(d) Green glands

Question 5. Bladder worm (cysticercus) is the larva of

(a) Liver fluke

(b) Tape worm

(c) Nereis

(d) Mussel

Question 6. A parasite having no intermediate host is

(a) Tape worm

(b) Liver fluke

(c) Ascaris

(d) Plasmodium

Question 7. Pair of hearts present in earthworm are

(a) One

(b) Two

(c) Three

(d) Four

Question 8. Mollusc group in which eye resemble the vertebrate eye is

(a) Bivalvia

(b)Gastropoda

(c) Scaphopoda

(d) Cephalopoda

Question 9. A phylum that includes exclusively marine animals is

(a) Porifera

(b) Coelanterata

(c) Protozoa

(d) Echinodermata

Question 10. Sea Star belongs to the class

(a) Crinoidea

(b) Echinoidea

(c) Asteroidea

(d) Qphiuroida

Question 11. Besides Annelida and Arthropoda, the metamerism is exhibited by

(a) Acanthocephala

(b) Chordata

(c) Mollusca

(d) Cestoda

Question 12. Which of the following is an egg laying mammal?

(a) Kangaroo

(b) Rattus

(c) Ornithorhvnchus

(d) Oryctolagus

Question 13. Which of the following is not a true amphibian?

(a) Salamander

(b) Frog

(c) Toad

(d) Tortoise

Question 14. Metamerism is a characteristic feature of the phylum

(a) Porifera

(b) Annelida

(c) Mollusca

(d) Platyhelminthes

Question 15. Animal without respiratory, circulatory and excretory systems are

(a) Liverflukes

(b) Tapeworms

(c) Sponges

(d) Thread worms

## ➢ Fill In the Blanks:

1. The body cavity, which is lined by mesoderm is called ..... Animals possessing coelom are called .....
2. An ..... digestive system has only a single opening to the outside of the body that serves as both mouth and anus.
3. A ..... digestive system has two openings ..... and .....
4. The cicrulatory system may be of two types (i) ....., (ii) .....
5. Some sponges are .....
6. Animals, in which the cells are arranged into two embryonic layers, an external ..... and an internal endoderm, are called ..... animals.

## ➢ True or False:

1. Some Mammalia have even adapted to fly or live in water.
2. The digestive tract of birds has additional chambers, the crop and gizzard.
3. Reptiles are cold-blooded animals. Excretory organ is kidney.

4. The amphibian skin in moist
5. Osteichthyes body is streamlined. Mouth is mostly terminal in position.
6. Chondrichthyes skin in tough, containing minute placoid, scales, which are embedded in it. These animals are predatory and have powerful jaws with teeth.

## ➢ Very Short Question:

1. List the levels or grades of the organization
2. Define the term incomplete digestive system.
3. Define the term complete digestive system.
4. Define the term open-type circulatory system.
5. Define the term closed type circulatory system.
6. Define radial symmetry.
7. Define the bilateral symmetry
8. What is the diploblastic organization?
9. What is the triploblastic organization?
10. Define the coelom.

## ➢ Short Questions:

1. Discuss the level or grades of the organization.
2. Discuss the types of patterns in the organ system.
3. Define radial symmetry and bilateral symmetry.
4. Define the diploblastic and triploblastic organization.
5. Outline the role of body cavity and coelom in animals.
6. Define metamerism.
7. Draw the diagram broad classification of Kingdom Animalia based on common fundamental features.
8. Describe the phylum Cnidaria.

## ➢ Long Questions:

1. Describe the phylum Arthropods.
2. Describe the phylum Porifera.

## Assertion Reason Question-

1. In these questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion

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

(d) If both Assertion and Reason are false.

**Assertion:** Radial symmetry in animal helps in detecting food and danger.

**Reason:** It enables the animal to respond to stimuli from any direction.

2. In these questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion

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

(d) If both Assertion and Reason are false.

**Assertion:** Animals that have an exoskeleton, lacks an endoskeleton.

**Reason:** Skeleton cells in the embryonic stage migrate to either stage and produce exoskeleton or endoskeleton but never both.

## Case Study Based Question-

1. Direction Read the following and answer the questions that follow

The water vascular system in echinoderms is a unique and defining characteristic that acts as a vital part of whole animal's body. It consists of hundreds to thousands of tubefeets that are found in the ambulacral grooves. Due to this, this system is also called ambulacral system. The water vascular system controls the tubefeets hydraulically through a complex of fluid-filled canals and reservoirs. In response, tubefeets perform various functions. Echinoderms also possess special structures for respiration.

(i) The ambulacral system is ..... in origin.

(a) ectodermal

(b) mesodermal

(c) coelomic

(d) endodermal

(ii) In echinoderms, tubefeet help in

(a) locomotion and food capture

(b) paralysing the prey

(c) the formation of leucocytes

(d) All of the above

(iii) The respiratory structure in echinoderms is

(a) dermal branchiae

(b) bursae

(c) tubefeet

(d) All of the above

(iv) The haemal system in echinoderms

(a) contains myoglobin pigment

(b) is of open type

(c) contains two-chambered heart

(d) All of the above

(v) **Assertion (A)** Tubefeet expand or contract due to the hydrostatic pressure within it.

**Reason (R)** They help to filtere the water that enter the water vascular system.

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true, but R is not the correct explanation of A

(c) A is true, but R is false

(d) Both A and R are false

2. Direction Read the following and answer the questions that follow

Coelenterates are aquatic, mostly marine organisms exhibiting tissue level of organisation. Their body is characterised by tentacles, stinging cells and horny or calcareous exoskeleton. They possess well-defined gastrovascular cavity having single opening, polymorphism is one of the major characteristic of coelenterates. In this, the organism exists in different forms out of which one is sessile, while the other is free-swimming. These forms exhibit division of labour and alternation of generation. Major representative animals of this group are Adamsia, Physalia, Gorgonia, etc.

(i) A freshwater coelenterate is

(a) Hydra

(b) Obelia

(c) Aurelia

(d) Physalia

(ii) The exoskeleton of corals is composed of

(a) pectins

(b) keratin

(c) calcium carbonate

(d) calcium sulphate

(iii) Medusae form is seen in

(a) Hydra

(b) Aurelia

(c) Adamsia

(d) Both (b) and (c)

(iv) The comon name of Adamsia is

(a) sea fan

(b) jellyfish

(c) sea fur

(d) sea anemone

(v) One of the special character of Coelenterata, only is the occurrence of

(a) polymorphism

(b) flame cells

(c) hermaphroditism

(d) nematocysts

## ✓ Answer Key-

### ➢ Multiple Choice Answers:

1. (b) Haemocoel
2. (d) Food vacuoles
3. (b) Spicules (skeleton)
4. (b) Flame cells
5. (b) Tape wrom
6. (c) Ascaris
7. (d) Four.
8. (d) Cephalopoda
9. (d) Echinodermata
10. (c) Asteroidea
11. (d) Cestoda

12. (c) Omithorhynchus
13. (d) Tortoise
14. (b) Annelida
15. (c) Sponges

## ➢ Fill In the Blanks:

1. coelum, eucoelomates
2. incomplete
3. complete, mouth, anus
4. open type, closed type
5. asymmetrical
6. ectoderm, diploblastic

## ➢ True or False:

1. True
2. True
3. True
4. True
5. True
6. True

## ➢ Very Short Answers:

1. Answer:
   i. Cellular level
   ii. Tissue level
   iii. Organ level
   iv. Organ- system level
2. Answer: An incomplete digestive system has only a single opening to the outside of the body that serves as both mouth and anus.
3. Answer: A complete digestive system has two openings, mouth, and anus.
4. Answer: Open type, with the blood being pumped out of the heart and bathing the cells and tissues.
5. Answer: Closed type, in which the blood is circulated through a series of tubes of varying diameters (arteries, veins, and capillaries)
6. Answer: When any plane passing through the central axis of the body- divides the organism

(like spokes of a bicycle wheel) into halves that approximately mirror images, it is called radial symmetry:

7. Answer: Animals like annelids, arthropods, etc., where the body can be divided into identical left and right halves in only one plane, exhibit bilateral symmetry.
8. Answer: Animals, in which the cells are arranged into two embryonic layers, external ectoderm and internal endoderm, are called diploblastic animals.
9. Answer: Those animals in which the developing embryo has a third germinal layer, mesoderm, in between the ectoderm and endoderm are called triploblastic animals.
10. Answer: The body cavity is lined by a mesoderm is called coelom.

## ➢ Short Answer:

1. Answer: The kingdom Animalia includes multicellular heterotrophic animals, which exhibit different levels of organization as given below.

   Cellular LevelAnimal such as sponges, which are loose associations of cells, fall into this group. Some division of labor (activities) occurs among the cells, but these cells do not organize themselves into a definite tissue.

   Tissue Level Animals that have certain cells grouped together to form specific tissue are placed in this group, e.g. cnidarians and ctenophores.

   Organ Level This is observed in animals that have different kinds of tissues organized into distinct organs each specialized for a particular function, e.g. some platyhelminths.

   Organ-system Level Animals that have organs grouped together into functional systems, each system primarily concerned with a specific function are placed in this group, e.g., some platyhelminths, annelids, mollusks, arthropods, echinoderms, and chordates.

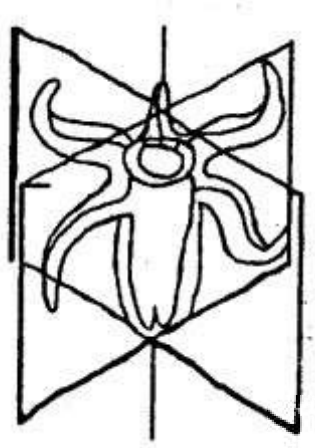
2. Answer: Various patterns of the complexity of organ systems serve as one of the useful criteria in classifying animals. For example, the digestive system may be absent, incomplete, or complete. An incomplete digestive system has only a single opening to the outside of the body that serves as both mouth and anus. A complete digestive system has two openings, mouth, and anus.

   Similarly, the circulatory system may be of two types

   i. Open type, with the blood being pumped out of the heart and bathing the cells and tissues directly or,

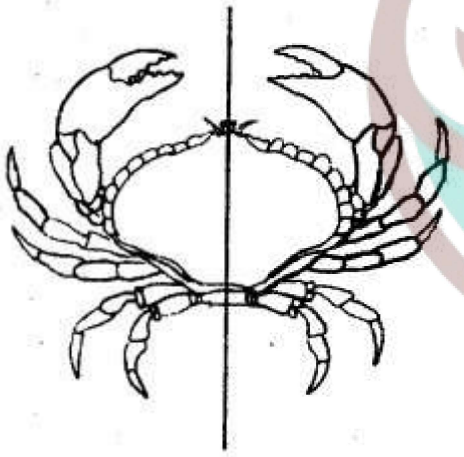
   ii. Closed Type, in which the blood is circulated through a series of tubes of varying diameters (arteries, veins, and capillaries).

3. Answer: Animals can be grouped into two categories based on symmetry. When any plane passing through the central axis of the body divides the organism (like spokes of a bicycle wheel) into halves that approximately mirror images, it is called radial symmetry. Cnidarians, ctenophores, and echinoderms have this kind of body plan (a).



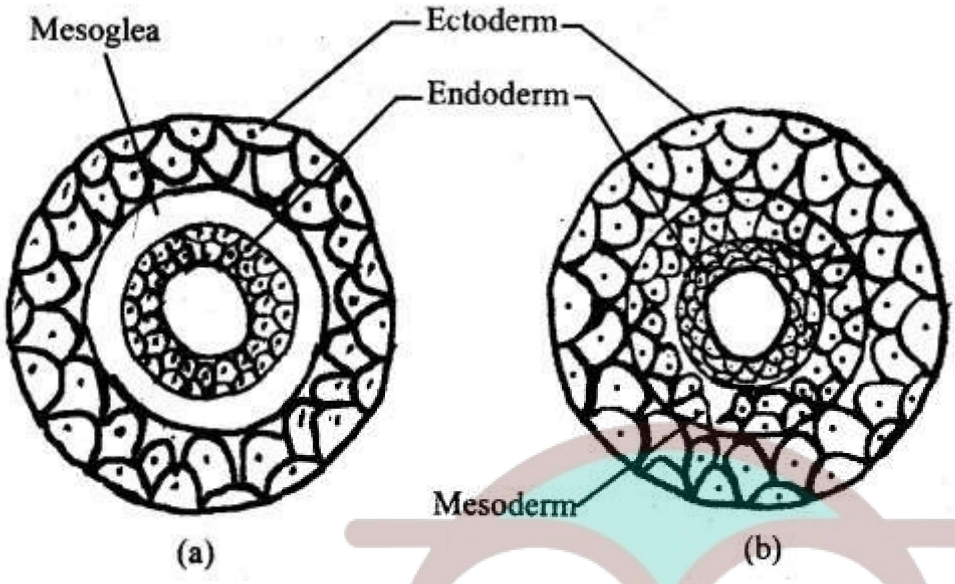
(a) Radial symmetry

Animals like annelids, arthropods, etc (b), where the body can be divided into identical left and right halves in only one plane, exhibit bilateral symmetry.



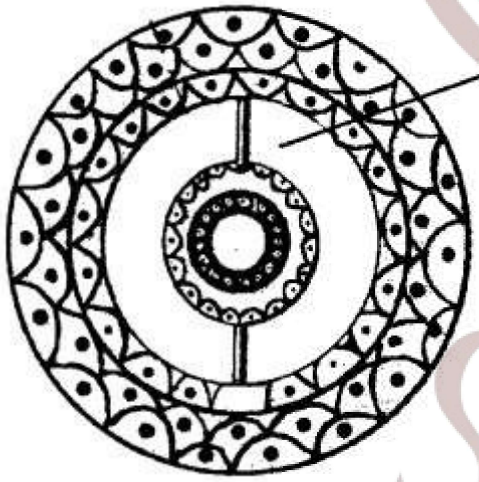
(b) Bilateral symmetry

4. Answer: Animals, in which the cells are arranged into two embryonic layers, external ectoderm and internal endoderm, are called diploblastic animals in the below figure. Those animals in which the developing embryo has a third germinal layer, mesoderm, in between the ectoderm and endoderm are called triploblastic animals.

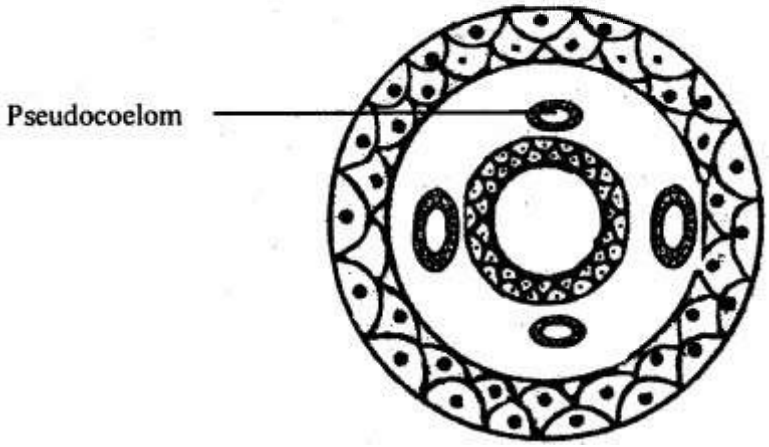



Showing germinal layers: (a) Diplobiastic (b) Triploblastic

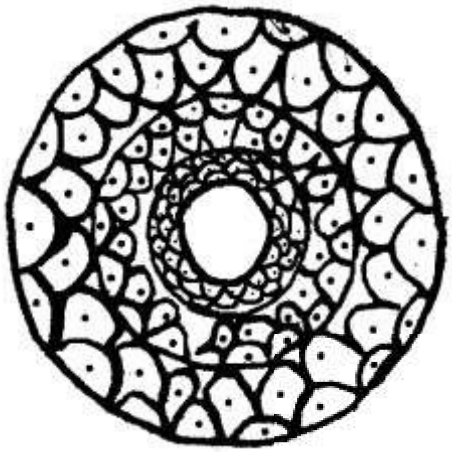
5. Answer: The nature of the space (body cavity) between the body wall and alimentary canal is very important in the classification. The body cavity, which is lined by mesoderm is called a column. Animals possessing coelom are called coelomates (e.g. annelids, mollusks, arthropods, echinoderms,




(a) Diagrammatic sectional view of Coelomate



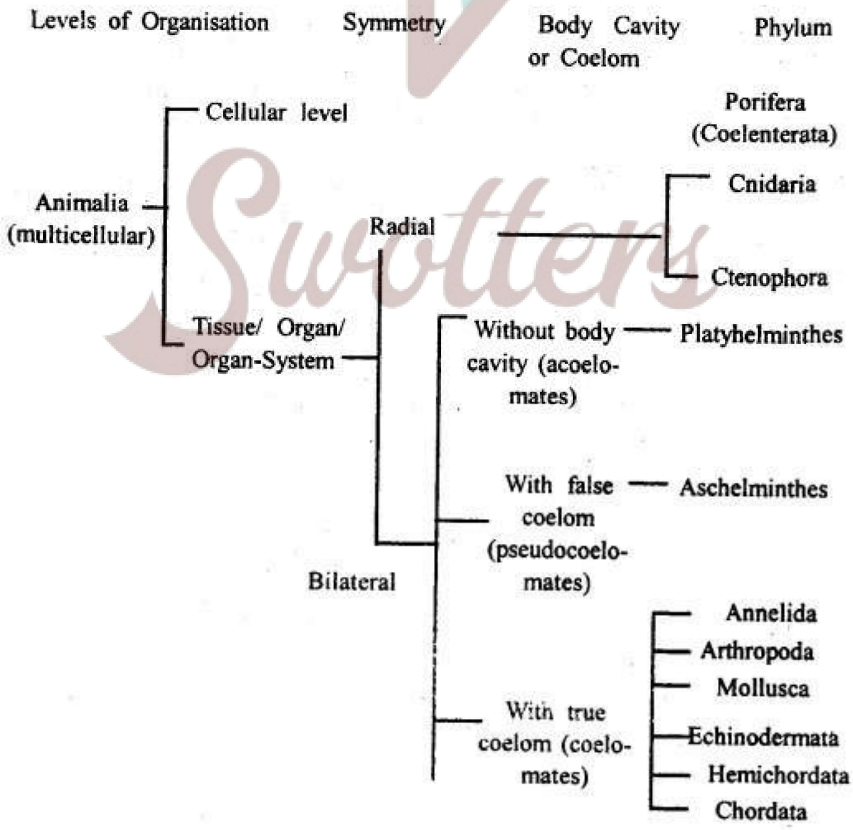
(b) Diagrammatic sectional view of Pseudocoelomate



(c) Diagrammatic sectional view of Aceolomate

hemichordates and chordates) (a). The animals in which the body cavity is absent are called acoelomates (e.g., platyhelminths) (c). 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 pseudocolor and the animals possing them are called pseudocoelomates (e.g., as helminths) (b)

6. Answer: In some animals (e.g., earthworm), the body has many segments, which show serial repetition of parts (like railway compartment). This kind of segmentation is called metameric segmentation, and the phenomenon is known as metamerism.
7. Answer:

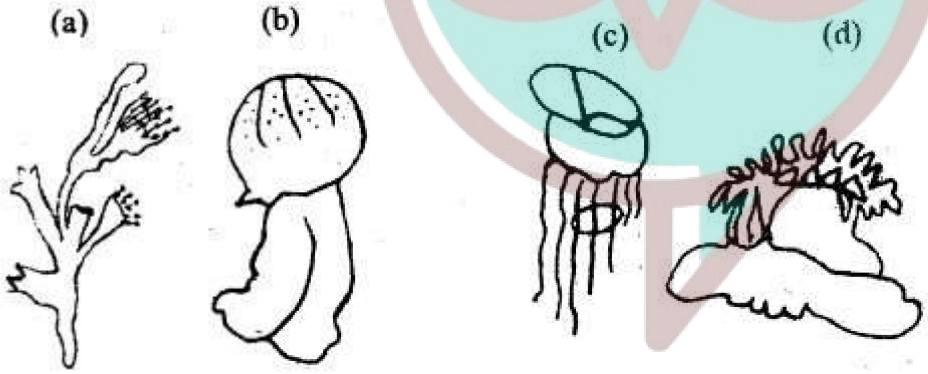


8. Answer: Cnidaria is aquatic, mostly marine, sessile, or free-swimming animals. The phylum name is derived from the stinging cells (nematocysts) or cnidoblasts present on the ectoderm of tentacles and on the body of these carnivorous animals. Cnidoblasts are used for anchorage, defense, and for capture of prey. Cnidarians exhibit tissue level of organization and exhibit radial symmetry. They are diploblastic.

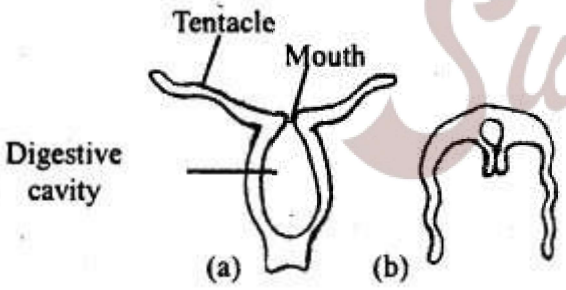
   The digestive system is incomplete. They have a central gastro-vascular cavity with a single opening, mouth. Digestion is extracellular and intracellular. Some of the cnidarians, e.g., corals, have skeletons composed of calcium carbonate.

   Cnidarians exhibit two basic body forms called a polyp (e.g., Hydra) and medusa (e.g., Auralia). The former, a sessile and cylindrical form, whereas, the latter, umbrella-shaped and free-swimming. Those cnidarians which exist in both forms exhibit alternation of generation, i.e. polyps asexually produce medusae and medusae forming the polyps sexually (e.g., Ophelia)

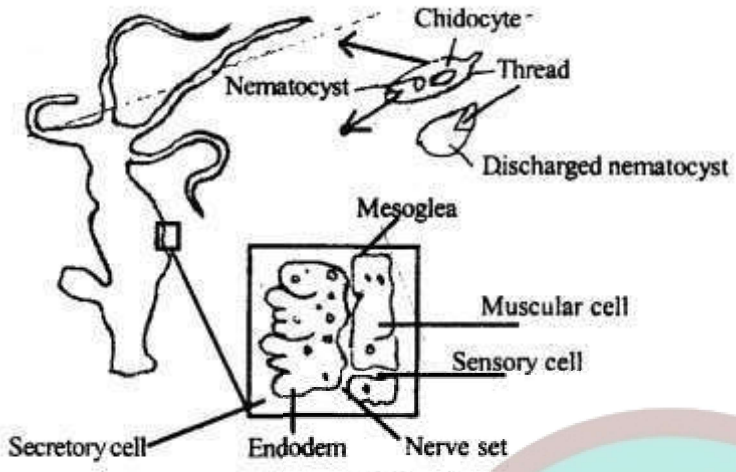
   Examples of cnidaria: Hydra, Porpita, Vellala, Physalia (Portuguese man-of-war), Aurelia (Jellyfish), Adamisia (Sea anemone), Pennatula (Sea- pen), Gorgonia (Sea-fan), and Meandrina (Brain coral).




Some cnidarians (a) Obelia (b) Jellyfish (c) Physalia (d) Sea anemone




Polyp and medusa body from (a) sessile poy (b) swimming medusa




Structure of Hydra

## ➢ Long Answer:

1. Answer: The phylum Arthropoda is the largest phylum of the animal kingdom consisting of more than 900,000 species, which include many economically important insects.

   i. They have an organ-system level of body organization. They are bilaterally symmetrical, triploblastic, segmented, and acoelomate animals.

   ii. The body of arthropods is covered by a chitinous cuticle which forms the exoskeleton. The body segments are fused to form the head, thorax, and abdomen.

   iii. They have jointed appendages. The appendages are variously modified to form antennae, mouthparts, pincers (chelicerae), or walking legs.

   iv. The digestive system is complete.

   v. Respiratory organs are gills, book gills, book lungs, or tracheal system.

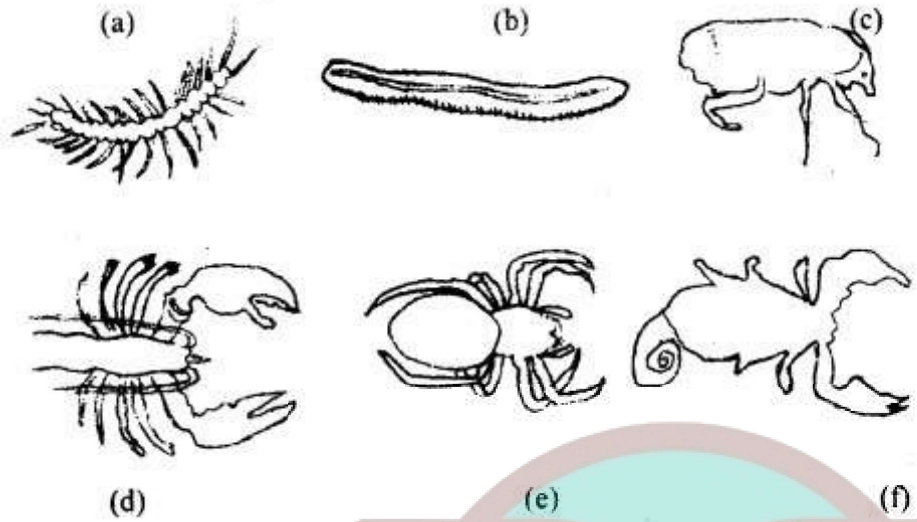
   vi. The circulatory system is open type.

   vii. The nervous system is almost similar to that of the annelids. Sensory organs include antennae for perceiving odor, receptors for taste, eyes (compound and simple), statocysts or balance, organs, and sound receptors.

   viii. Excretion takes place through green glands or malpighian tubules.

   ix. They are mostly dioecious. Reproduction is sexual. Fertilization is usually internal. They are mostly oviparous.

   Development may be direct or indirect, passing through many larval stages. The process of transformation of a larva into an adult is called metamorphosis.




Some common arthropods (a) Centipede (b) Millipede (c) Beetle (d) Prawn (e) Spider and (f) Scorpian

Examples of Arthropoda: Araneus (Garden spides), Limulus (King crab),

Buthus (Scorpion), Scolopendra (Centipede), Cancer (Common crab), Balanus (Barnacle), Lepisma (Silverfish), Periplaneta (Cockroach), Apis (Bee) Anopheles (Mosquito), Musca (Housefly), Charaxes (Butterfly), Attelabus (Beetle), Locusta (Locust) and An ax (Dragonfly).

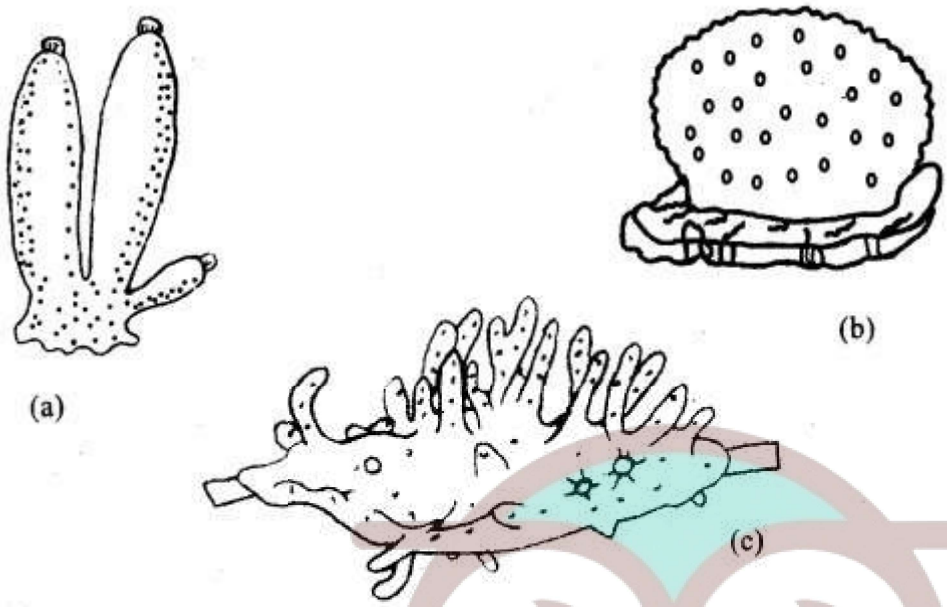
2. Answer: Members of this phylum are commonly known as sponges. They are generally marine, diploblastic bilaterally symmetrical with a significant water transport mechanism. They are considered as very primitive multi-cellular animals and have a cellular level of organization.

   Water can enter through minute pores (Ostia) in the body wall directly or through the canal into a central cavity, spongocoel, from where it goes out through the osculum.

   This pathway of water transport is called the canal system and is helpful in food gathering, respiratory exchange, and removal of water. Choanocytes or collar cells line the spongocoel and the canals. Digestion is intracellular. The body is supported by a skeleton made up of spicules or spongin fibers.

   Sexes are not separate (monoecious/hermaphrodite/bisexual), i.e., eggs and sperms are produced by the same individual. Sponges reproduce asexually by fragmentation and sexually by the formation of gametes. Fertilization is internal and development is indirect having a larval stage that is morphologically distinct from the adult.

   Examples of Porifera are Sycon (Scypha), Spongilla, Chalina, (Dead man's finger), and Euspongia (Bath sponge)




Examples for Porifera: (a) Sycon (b) Euspongia (c) Spongilla

## Assertion Reason Answer-

1. (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

   **Explanation:** Radial symmetry is advantageous for an animal in responding to stimuli from any direction thereby allowing it to detect food and danger easily.

2. (d) If both Assertion and Reason are false.

   **Explanation:** Many animals have an endoskeleton and exoskeleton such as Chelon-turtle or Testudo-tortoise. Exoskeleton of other animals include chitinous plate, calcareous shell, horny scales, feathers, hair, claws, nails, hoofs, horns and antlers.

## Case Study Based Answer-

1. **Answer:**

   (i) (c)

   (ii) (a)

   (iii) (d)

   (iv) (b)

   (v) (c)

2. **Answer:**

   (i) (a)

   (ii) (c)

   (iii) (b)

   (iv) (d)

   (v) (d)