

SHORT QUESTIONS

2. Write four distinct features of animals.

Ans: The four distinct features of animals are listed below.

- (i) Multicellular eukaryote
- (ii) Ingestive heterotrophs
- (iii) Reproduce sexually
- (iv) Cell wall and plastids are absent
- (v) Centrioles are present

3. Name the four criteria for animal classification.

Ans: Animals can be classified according following criteria.

- (i) Presence or absence of tissue.
- (ii) Number of tissue layers.
- (iii) Body symmetry.
- (iv) Types of body cavity.

4. Classify animals on the basis of presence and absence of tissue.

Ans: Animals can be classified according to the presence or absence of tissues into two subkingdoms. **Parazoa** and **Eumetazoa**.

Parazoa:

Parazoa includes the simplest metazoans or multicellular animals that show the cellular grade of organization in which cells demonstrate division of labour but are not strongly associated to perform a specific collective function. They are asymmetrical. It includes all the sponges.

Eumetazoa:

In Eumetazoa – similar cells are grouped together into a highly coordinated unit called **tissue**. The tissues are assembled into large functional unit called organs. Different organs operate together as **organ system**.

5. Differentiate the diploblastic and Triploblastic levels of organization.**Ans:**

Diploblastic	Triploblastic
Diploblastic animals produce two primary germ layers endoderm and ectoderm during gastrulation	Triploblastic animals produce three primary layers Endoderm, the mesoderm and the ectoderm during gastrulation
Diploblastic animals are radially symmetrical.	Triploblastic animals are bilaterally symmetric.
Do not have a mesoderm.	Develop a mesoderm.
Do not have body cavities.	Develop a body cavity the coelom.
Do not have organs.	Have true organs.

<p>Examples include</p> <p>Jellyfish, Corals, Combfish</p>	<p>Examples include vertebrates, Molluscs, Worms, arthropods, echinodermata.</p>
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6. To what life style is radial symmetry an adaptation?

Ans: Radial symmetry is considered as adaptation for a **sessile life**. It includes all the animals with **radial symmetry** having a top and bottom and similar body parts are arranged as spokes or radiate from a central body axis.

Examples: (i) Jelly fish (ii) Sea anemone

7. To what life style is bilateral symmetry an adaptation?

Ans: Bilateral symmetry is considered an adaptation to motility.

Examples: (i) Arthropods (ii) Vertebrae (iii) Echinoderms

8. Describe the body layers of sponges.

Ans: The sponges consist of outer dermal layer called **pinacoderm**, and inner layer choanoderm made of flagellated cells called choanocytes. The middle region is called **mescenchyme**.

9. What are nematocysts?

Ans: Nematocysts are specialized cells in the tentacle of Jellyfish or other coelenterates containing a barbed or venomous coiled thread that can be projected in self defense or to capture prey.

10. Give three features of Platyhelminthes for parasitic mode of life.

Ans: Following are the three features of Platyhelminthes for parasitic mode of life.

- (1) Digestions:** Digestive system is incomplete i.e. gastrovascular type having only one opening to the exterior the mouth.
- (2) Respiration:** Respiratory system is absent.
- (3) Transport:** Transport system is absent.

11. Give three distinguishing features of Aschelminthes.

Ans: Following are the distinguishing features of Aschelminthes:

- (i)** The roundworms are free living or parasites.
- (ii)** Most roundworms are less than five cm long and many are microscopic but some parasitic roundworms are more than one meter in length.
- (iii)** The worms exhibit bilateral symmetry having three germ layers.
- (iv)** Body is cylindrical tapering at both ends Muscular layer is not continuous.
- (v)** It is divided into four longitudinal quadrants, two – dorsolateral, two – ventrolateral.
- (vi)** The body cavity is pseudocoelom.
- (vii)** Most nematodes are dioecious. Fertilization is internal.

12. How locomotion takes place in Annelids?

Ans: The annelids are called segmented worms. The body wall contains circular and longitudinal muscles which help in **locomotion**. The organs of locomotion are chitinous **chaetae or setae**.

13. Write five salient features of phylum Arthropoda.

Ans: Following are the salient features of phylum Arthropoda.

- (i) The arthropods are called joint footed animals.
- (ii) They are free living or parasites and are found in all types of habitat.
- (iii) The body is segmented.
- (iv) Some are worm like and others are flying insects. Segments are modified, specialized and fused.
- (v) Symmetry is bilateral; head, thorax and abdomen variously distinct or fused.
- (vi) Body is covered by **chitin**. It is flexible at many places to allow articulation.
- (vii) There are several pairs of appendages.
- (viii) Coelom is not present as the main body cavity.

14. List any four harmful roles of insects.

Ans: Harmful roles of insects are listed below.

- (i) **Insects** destroy field crops, fruit trees and timber plants.
- (ii) They spread diseases among human beings.
- (iii) Bees and wasp's sting, mosquitoes, lice and fleas bite and suck blood
- (iv) Scorpions and a few spiders are poisonous and sting.

15. List the similarities between echinoderms and chordates.

Ans: Echinoderms show close resemblance with chordates.

- (1) Both have mesodermal skeleton.
- (2) Both are deuterostomes.
- (3) Both have similar early development.
That is why echinoderms have placed closest to phylum chordate.

16. What does the term amphibian mean? Why amphibians are not considered a very successful group of vertebrates?

Ans: The word amphibian has been derived from Greek word "amphi" meaning both and "bios" meaning life.

It is defined as a group of cold-blooded vertebrates which are distinguished by having an aquatic gill breathing larval stage followed by a terrestrial lung breathing adult stage. Amphibians are on the borderline between aquatic and terrestrial animals. The animals live in moist condition or in water. So, the amphibians are not a successful group owing to their dependence on water as habitat, reproduction and development.

Examples: Toads, frogs, newts and salamanders.

17. Describe the ways, which amphibians are adapted to life land, and in what they are still restricted to a watery or moist environment.

Environment.

Ans: Following are the ways, which amphibians are adapted to the life.

- (i) Limbs for movement on solid substratum.
- (ii) Lungs for breathing air.
- (iii) Internal nares to make breathing possible by keeping mouth closed

- (iv) Slimy skin for protection against desiccation.
- (v) Changed in circulatory system to provide respiration by lungs and skin.
- (vi) There is reduction in bones to make the body lighter.

18. List the adaptations that distinguish reptiles from amphibians and help them adapt to life in dry terrestrial environment.

Ans: Evolutionary adaptations in class reptilian:

Reptiles show the advancement over the amphibians in having

- (a) A dry skin which enables them to live away from water.
- (b) Separation of oxygenated and deoxygenated blood in the heart.
- (c) A neck movable independent of the body.
- (d) Better mechanism of breathing
- (e) Fertilization is internal.
- (f) Egg with shell for protection on land.

19. Give an example of ectothermic and endothermic animals.

Ans: Examples of ectothermic animals.

- | | |
|---------------|-----------------|
| (i) Snakes | (ii) Turtles |
| (iii) Lizards | (iv) Alligators |

Example of endothermic animals:

- | | |
|-----------|--------------|
| (i) Birds | (ii) Mammals |
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20. Name two phyla of animals that are radially symmetrical and that are bilaterally, symmetrical.

Ans: Following are the phyla of animals that have radial and bilateral symmetry.

- (i) Cnidaria and Echinodermata are the two phyla of animals that are bilateral symmetrical.
- (ii) Arthropoda and vernaloda are the two phyla of animals that are bilaterally symmetrical.

21. List the vertebrate class (or classes) in which we find each of the following:

- (a) A Skeleton of cartilage
- (b) A two-chambered heart
- (c) The amniotic egg
- (d) A four chambered head
- (e) Lung supplemented by air sacs
- (f) Placenta

Ans: (a) A skeleton of cartilage is present in class Chondrichthyes

(a) A two-chambered heart is present in class Osteichthyes.

(b) The amniotic egg is present in class Mammals.

(c) A four chambered head is present in class Mammals and Aves.

(d) Lungs supplemented by air sacs are present in class Aves.

(e) Lungs supplemented by air sacs are present in class Aves

22. Identify the phyla that have the following characteristics:

- (a) radial symmetry
- (b) acoelomate
- (c) pseudocoelomate
- (d) alternational sexual and asexual stages
- (e) cnidocytes

23. Write three main difference between prototheria, metatheria and eutheria.

Ans: Differences between prototheria, metatheria and eutheria:

Characteristic	Prototheria	Metatheria	Eutheria
Literal names	Egg laying mammals	Pouched mammals	Placental mammals
Aquatic adaptation	Adapted to aquatic environment	Not adapted to aquatic environment	Few are adapted to aquatic environment
Placenta	Absent	Absent	Present
Marsupium	Absent	Present	Absent
Cloaca	Present	Absent	Absent

24. How do mammals differ from birds? And what adaptations do they share?

Ans: Difference between mammals and birds.

Mammals	Birds
Lack feathers	Have feathers
Possess teeth and lack beaks	Lack teeth and possess beaks
Don't lay eggs	Lay eggs

Members of mammals group	Members of group Aves
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Adaptation shared by them:

- (i) Both are warm blooded i.e. endothermic.
- (ii) Both are from phylum chordate.
- (iii) Both are vertebrates.
- (iv) Both have four chambered heart.
- (v) Both take care of young ones.
- (vi) Both have blood having erythrocytes and leukocytes.

25. Define/Describe/Explain briefly:

Animals, Parazoa, Eumetazoa, diploblastic animals, Triploblastic animals, radial symmetry, bilateral symmetry, coelom, blastula, protostomes, deuterostomes, nematocyst, mesoglea, zoid, radula, trochophore larva, parapodia, haemocoel, metamorphosis, water vascular system, Protochordata, notochord, swim bladder, amnion, placenta.

Ans: Animals:

"Animals are eukaryotic, multicellular heterotrophs that lack cell walls".

Animals are found almost in all types of habitat. They may be free living motile, sessile or a parasite. They range in size from worms only seen with a microscope to blue whales.

Parazoa:

Parazoa includes the simplest metazoans or multicellular animals that shows the cellular grade of organization in which cells demonstrate division of labour but are not strongly associated to perform a specific collective function. They are asymmetrical. It includes all the sponges.

Eumetazoa.

This is a major division of the animal kingdom comprising all multicellular forms except the sponges.

In Eumetazoa - similar cells are grouped together into highly coordinated unit called tissue. The tissues are assembled into larger functional unit called organs. Different organs operate together as organ system.

Diploblastic animals:

Animals in which the cells are arranged in two embryonic layers, an external ectoderm and an internal endoderm, are called diploblastic animals.

Example: Coelenterates

Triploblastic animals:

Triploblastic Describing an animal having a body composed of three embryonic cell layers the ectoderm, mesoderm and endoderm. Most multicellular animals are triploblastic.

Radial symmetry

Radial symmetry form symmetry in which the body plan divisible into idea of radial symmetry.

Radial various ways is a symmetry in which the sides exhibit correspondence or regularity of parts around a central axis. It is lacking left and right.

Examples: Sea stars sea anemones, jellyfish and sea urchins.

Bilateral symmetry:

A form of symmetry in which the opposite sides along a midline is a duplicate of the other in terms of body parts or appearance.

Bilateral symmetry is a form of symmetry in which the opposite sides are similar. The external appearance is the same on the left and right sides in a sagittal plane.

Examples: Such as the body plan of most animals, including humans.

Coelom:

Coelom is a fluid filled space between the outer body wall and the digestive tube.

OR

A coelom is a fluid-filled body cavity that is completely lined by tissue created from the mesoderm, the middle layer of the primary cells found in a embryo.

Blastula:

The blastula (from Greek blastos, meaning "sprout") is hollow sphere of cells, referred to as blastomeres, surrounding an inner fluid-filled cavity called the blastocoele formed during an early stage of embryonic development in animals.

Protostomes:

In most of the mollusks, annelids and arthropods, the first opening in the embryo becomes the mouth.

These animals are **protostomes** (from Greek words meaning "first, the mouth") **Deuterostomes:**

Deuterostomia is a subtaxon of the Bilateria branch of the subkingdom Eumetazoa, within Animalia, and are distinguished from protostomes by their deuterostomic embryonic development; in deuterostomes, the first opening (the blastopore) becomes the anus, while in protostomes, it becomes the mouth.

Nematocyst:

A capsule within specialized cells in the tentacles of cnidarians, such as jellyfish and corals, containing a barbed, threadlike tube that delivers a toxic sting to predators and prey.

Mesoglea:

Mesoglea, also known as mesonyl, is the translucent, non-living, jelly-like substance found between the two epithelial cell layers (i.e. between the ectoderm and endoderm) in the bodies of cnidarians and sponges.

Mesoglea refers more correctly to the tissue found in jellyfish and it functions as a hydro-static skeleton. Mesophylls generally refers to tissue found in sponges.

Zoid:

Zoid is and organic cell or organized body that has independent movement within a living organism, especially a motile gamete such as a spermatozoon. An independent animal like organism produced asexually, as by budding or fission.

Radula:

The radula (plural radulae or radulas) is an anatomical structure that is used by mollusks for feeding, sometimes compared to a tongue. It is a minutely toothed, chitinous ribbon, which is typically used for scraping or cutting food before the food enters the esophagus.

Trochophore larva:

Trochophore, also called **trochosphere**, small, translucent, free-swimming larva characteristic of marine annelids and most groups of mollusks.

Trochophores are spherical or pear-shaped and are girdled by a ring of cilia (minute hairlike structures), the prototroch, that enables them to swim.

Parapodium:

The term Parapodium refers to two different organs. In annelids, parapodia are paired, un-joined lateral outgrowths that bear the chaetae. In several groups of sea snails and sea slugs, 'Parapodium' refers to lateral fleshy protrusions.

Haemocoel:

Haemocoel the body cavity of arthropods and molluscs, which is filled with blood. The haemocoel is an enlarged blastocoel, which greatly reduces the coelom (this is restricted to the cavities of the gonads and gonads and excretory organs). The haemocoel can act as a hydrostatic skeleton.

Metamorphosis:

Metamorphosis is a biological process by which an animal physically develops after birth or hatching, involving a conspicuous and relatively abrupt change in the animal's body structure through cell growth and differentiation.

Water vascular system:

The water vascular system is a hydraulic system used by echinoderms, such as sea stars and sea urchins, for locomotion, food and waste transportation, and respiration. The system is composed of canals connecting numerous tube feet.

Protochordata:

A division of the phylum Chordata, including the Hemichordata, Urochorda and Cephalochorda. The group lacks a vertebral column, cranium and organs associated with the region of the head in other chordates, but have a dorsal nerve chord and gill slits.

Notochord:

A notochord is a primitive beginning to the backbone. It appears in embryos as a small flexible rod made from cells from the mesoderm, which is one of the three group of animals that includes humans.

Swim bladder:

The swim bladder, gas bladder, fish maw or air bladder is an internal gas-filled organ that contributes to the ability of many bony fish to control their buoyancy, and thus to stay at their current water depth without having to waste energy in swimming.

Amnion:

Amnion a thin, membranous sac filled with a watery fluid (called the amniotic fluid) in which the embryo or fetus of a reptile, bird, or mammal is suspended during prenatal development.

Placenta:

The placenta is a flattened circular organ in the uterus of pregnant mammals that nourishes and maintains the fetus through the umbilical cord. This cord is the main link from the fetus to the placenta. Through it, the placenta provides oxygen and nutrients to the growing baby and removes waste products.

26. Write the difference between:**(a) Parazoa and Eumetazoa:**

Parazoa	Eumetazoa
They are asymmetrical.	They are symmetrical.

They have no tissue.	They have tissues and organs.
They have cellular grade of organization	They have tissue level organization ranging to organ level organization
Example: Sponges	Example: Mammals

(b) diploblastic and triploblastic animals:

Diploblastic	Triploblastic
Diploblastic animals produce two primary germ layers endoderm and ectoderm during gastrulation	Triploblastic animals produce three germ layers Endoderm, the mesoderm and the ectoderm during gastrulation.
Diploblastic animals are radially symmetrical.	Triploblastic animals are bilaterally symmetric.
Do not have a mesoderm	Develop a mesoderm.
Do not have body cavities	Develop a body cavity, the coelom
Do not have organs.	Have true organs
Examples include Jellyfish, Corals, Combfish	Examples include: Molluscs, Worms, arthropods, vertebrates, Echinodermata

(c) radial symmetry and bilateral symmetry:

Radial symmetry	Bilateral symmetry
It constitutes grade radiate.	It constitutes grade bilateria.
It is considered an adaptation to sessile life.	It is considered an adaptation to motile life.
Diploblastic animals exhibits radial symmetry.	Triploblastic animals exhibit bilateral symmetry.
Examples: Jellyfish and sea anemone.	Examples: Vertebrates and Arthropoda.

(d) acoelomate and pseudocoelomate:

Acoelomate	Pseudocoelomate
There is no body cavity between the digestive tract and outer body wall, so these animals are called acoelomate .	If the body cavity develops between the mesoderm and endoderm. It is called pseudocoelom (false cavity)
Present inside the endoderm.	Present inside the mesoderm.
Example: Platyhelminthes (flatworm)	Example: Aschelminthes (nematodes)

(e) pinacoderm and choanoderm:

Pinacoderm	Choanoderm
The sponges consist of outer dermal layer called pinacoderm.	The sponges consist of inner dermal layer choanoderm.
It is involved in protection, shape maintenance and structural support.	It is involved in gaseous exchange digestion.
Pinacoderm made up of pinacocytes.	Choanoderm made of flagellated cell called choanocytes

(f) spongocoel and gastrovascular cavity:

Spongocoel	Gastrovascular cavity
The body cavity of sponges is called spongocoel	A central digestive cavity with a single opening that functions as both mouth and anus is called Gastrovascular cavity.
The opening of spongocoel is called osculum	The opening of Gastrovascular cavity is called mouth.

It is present only in sponges.	It is present in both Cnidaria and flat worms
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(g) hydroids and medusa:

Hydroids	Medusa
Hydroids are anchored, rigid barely moving specie found near the tidemark, they are attached to rocks	Medusas are freebie floating, found in open water
Hydroids has a tubular body with a protracted stalk.	Medusa has saucer shaped body with shortened trunk for example jelly fish
A fine parchment called vellum is absent in a Hydroids	There are four gonads in medusa.
There is no gonad in a Hydroids	There are four gonads in medusa.
Hydroids reproduces abiogenetically.	Medusa replicates sexually.

(h) endotherm and ectotherm:

Endotherm	Ectotherm
Higher BMR i.e. Basal metabolic rate.	Lower BMR i.e. Basal metabolic rate.
Higher Cmax i.e. heat capacity.	Lower Cmax i.e. heat capacity.
Greater food demands.	Lower food demands.
Mainly aerobic metabolism.	Mainly anaerobic metabolism.
Greater stamina.	Lower stamina.
Examples: Birds, Mammals	Examples: Reptiles

