STD:9 **BIOLOGY**

CH-3 DIVERSITY

I.ANSWER THE FOLLOWING QUESTIONS:

1. Explain the basis of grouping organisms into five kingdoms.

The five-kingdom classification proposed by Robert Whittaker is based on three main features:

Cell structure: The organism is either prokaryotic (lacking a defined nucleus) or eukaryotic (having a well-defined nucleus).

Body organization: The organism is either unicellular or multicellular.

Mode of nutrition: The organism either makes its own food or depends on others for food.

2. What is symbiotic relationship?

A symbiotic relationship is a close relationship between two different species where both organisms live together and benefit each other.

Example: In lichens, an algae and a fungus live together. The algae provides food, while the fungus provides water, minerals, and shelter.

3. What is meant by biodiversity?

Biodiversity refers to the vast variety of life forms (plants, animals, and microorganisms) found in a specific region or on Earth. It encompasses the diversity of species, their genes, and the complex ecosystems they form.

4. Why lichens are called dual organisms?

Lichens are called dual organisms because they are made up of two entirely different organisms living together in a mutually beneficial relationship:

Algal component: Contains chlorophyll to prepare food through photosynthesis.

Fungal component: Absorbs water, provides minerals, and offers shelter to the algae.

5. What are the advantages of classifying organisms?

i) Simplifies the identification of new organisms.

ii) Reveals evolutionary relationships between different groups.

iii) Supports advancements in scientific research, agriculture, and medicine.

6. What organisms can be said to belong to the same species?

Organisms belong to the same species if they can interbreed naturally and produce fertile offspring.

7. Blue-green algae and bacteria are placed in the same kingdom. Justify.

Both blue-green algae (cyanobacteria) and bacteria are placed in the kingdom Monera because they are unicellular, prokaryotic organisms. They both lack a well-defined nucleus and membrane-bound cell organelles, sharing a fundamental cellular structure.

8. Distinguish between fungi and plantae based on their nutrition.

Fungi have a heterotrophic (saprophytic) mode of nutrition,they cannot make their own food and absorb nutrients from decaying organic matter. Plantae have an autotrophic mode of nutrition, using chlorophyll to prepare their own food through photosynthesis.

9. What are cryptogams?

Cryptogams are non-flowering and seedless plants that have hidden or inconspicuous reproductive organs. They reproduce mainly by producing spores, and this group includes thallophytes, bryophytes, and pteridophytes.

10. Bryophytes are also known as amphibians of the plant kingdom. Discuss.

Bryophytes are called the amphibians of the plant kingdom because they live on land but are completely dependent on water to complete their life cycle. They strictly require a film of external water so their male gametes can swim and fertilize the female gametes.

11. Gymnosperm = Gymno (naked) sperms (seeds). Give reasons.

Gymnosperms are called "naked seed" plants because their ovules are not enclosed within an ovary wall. Consequently, the seeds that develop after fertilization remain exposed and are not covered by a fruit shell.

12. What are phanerogams?

Phanerogams are advanced plants that possess well-differentiated reproductive tissues and successfully produce seeds. This group includes both gymnosperms and angiosperms, which reproduce via specialized structures like cones or flowers.

13. What is venation? How is it helpful on identifying the plants?

Venation is the structural arrangement of veins and veinlets in the lamina of a leaf. It helps identify plants because monocots typically display parallel venation, whereas dicots display reticulate (net-like) venation.

14. Which organisms are called primitive and how are they different from advanced organisms?

Primitive organisms are those with simple, ancient body designs that have not changed much over evolutionary time. They differ from advanced organisms, which have developed complex body structures and functional divisions of labor more recently.

15. State the features of non-chordates.

Non-chordates are animals that completely lack a structural backbone or embryonic notochord. They typically feature a ventral solid nerve cord (if present), pharyngeal gill slits are absent, and their heart is located dorsally.

16. What is haemocoel?

A haemocoel is a blood-filled primary body cavity found in certain invertebrates where the open circulatory system operates. In these animals, internal organs are bathed directly in blood rather than being enclosed within capillary networks or blood vessels.

17. How is coelom in animals help in classification?

The presence, absence, or type of a coelom (a true body cavity lined by mesoderm) helps classify animals into three distinct structural groups: acoelomates (no body cavity), pseudocoelomates (false body cavity), and coelomates (true body cavity).

18. Find out the difference between flatworms and roundworms.

Flatworms (Platyhelminthes) have a dorsoventrally flattened body with an incomplete digestive system (no anus). Roundworms (Nematoda) possess an elongated, cylindrical body with a complete digestive tract running from mouth to anus.

19. Give the groups of animals that are haemocelomate.

The primary groups of animals that are haemocelomate (possessing a blood-filled haemocoel) are Phylum Arthropoda (such as insects, spiders, and prawns) and Phylum Mollusca (such as snails and octopuses).

20. What is meant by cold blooded animal? Give examples.

Cold-blooded animals (poikilotherms) are organisms that cannot internally regulate their own body temperature, causing it to change with the surrounding environment. Examples include fishes (like Rohu), amphibians (like frogs), and reptiles (like lizards).

21. What is meant by warm blooded animal? Give examples.

Warm-blooded animals (homeotherms) are organisms that can maintain a constant internal body temperature regardless of the temperature changes in their external environment. Examples include birds (Aves) like pigeons and mammals like humans.

22. Name some animals with four chambered heart under different class.

Animals with a four-chambered heart belonging to different classes include:

Class Reptilia: Crocodiles

Class Aves: Pigeons, sparrows, and crows

Class Mammalia: Humans, dogs, and whales

23. Explain how animals in vertebrata are classified in to further sub groups?

Vertebrata are classified into further sub-groups based on their respiratory organs (gills or lungs), heart structure (number of chambers), body covering (scales, feathers, or hair), and mode of reproduction (laying eggs or giving birth).

24. Why is crocodile considered as an exception to the class reptilian?

Reptiles typically possess a three-chambered heart with an incomplete ventricular septum. Crocodiles are an exception because they possess a fully developed four-chambered heart, a advanced characteristic usually seen only in birds and mammals.