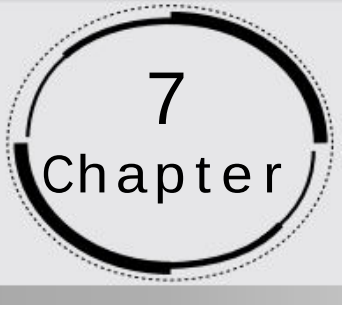
Diversity In Living Organisms



1. Will advanced organisms be the same as complex organisms? Why?

Ans: Yes, the advanced organisms are the same as complex organisms because complexity in body structure increased with evolution due to different adaptation, therefore the body structure of advanced organisms is different from the primitive one and the advanced organisms or complex organisms are the same.l

2. In which kingdom will you place an organism which is single-celled, eukaryotic and photosynthetic.

Ans: The characteristics like single cell, eukaryotic and photosynthetic are shown by Kingdom Protista, Therefore the organisms with all these characteristics will place under the Kingdom Protista.

3. Which division among plants has the simplest organisms?

Ans: Among plants,

- Thallophyta division shows the simplest form of organisms.
- It does not have a well differentiated body like other plants and it is not differentiated into root, stem and leaves.

4. Why do we classify organisms?

Ans: We classify organisms as:-

- Due to the diversity present between different organisms, classification of organisms is necessary to differentiate between their characteristics and function.
- A single kingdom consists of varieties of species which show different characteristics. So, it will be very difficult to study each of the species one by one from 30 million species.

Therefore, scientists felt the need of grouping different species based on some observable similar characters. Classification of organisms also helps to find out evolutionary relationships between different organisms.

5. Which do you think is a more basic characteristic for classifying organisms?

(a) The place where they live.

(b) The kind of cells they are made of. Why?

Ans: (b) The kind of cells they are made up of.

(1) Living organisms are mainly differentiated into five kingdom classification in which one of the classification is based on the type of cells. It may be eukaryotes or pork.

(2) A eukaryotic cell has membrane-bound organelles, including a nucleus, which allows cellular processes to be carried out efficiently which differ from each other.

6. What is the primary characteristic on which the broad division of organisms is made?

Ans:

(1) The primary characteristic on which the broad division of organisms is made is Nature of the cell.

(2) The nature of the cell characteristic mainly includes the presence or absence of membrane-bound cell organelles from small single cell bacteria to large living organisms which are multicellular.

Therefore on the basis of the nature of the cell the organisms are divided into prokaryotes and eukaryotes.

7. Which organisms are called primitive and how are they different from the so-called advanced organisms?

Ans: When we connect the idea of evolution to classification, we find two groups of organisms.

(1)The first group has few organisms which are also known as lower organisms and primitive because their body structure is simple and has not changed much for e.g., primitive protozoans.

(2)The second group has organisms which have acquired particular body designs by accumulating changes over a period of time like complex body structure therefore they are known as higher organisms or complex organisms. For example, it includes all eukaryotes.

8. What is the criterion for classification of organisms as belonging to the kingdom Monera or Protista?

Ans: Based on cell structure, the criterion for classifying organisms belonging to the kingdom Monera or Protista:-

(1) Kingdom Monera consist of prokaryotic organisms that do not have a well-defined nucleus or membrane-bound organelles nor do they have cellulose cell walls.

(2)Kingdom Protista, on the other hand are eukaryotes which includes organisms with a well-defined nucleus and membrane-bound organelles with presence of cellulosic cell wall in some organisms.

9. In the hierarchy of classification, which grouping will have the smallest number of organisms with a maximum of characteristics in common and which will have the largest number of organisms?

Ans: In the hierarchy of classification each step is represented by rank or category which start from species and ends on kingdom.

(1)The species group consists of the smallest number of organisms with the maximum characteristic in common. Therefore it is easy to distinguish one species from another.

(2)The kingdom group has the largest number of organisms with different characteristics shown by different types of organisms. Therefore, in the case of a kingdom it is difficult to determine the relationship between different groups of organisms.

10. How would you choose between two characteristics to be used for developing a hierarchy in classification?

Ans: Hierarchy of classification starts from species and ends on kingdom. The main fundamental characteristics help in the differentiation of organisms based on their structure and functions. Like,

(1)Classification based on characteristics of the cell, like prokaryotes do not have membrane bound nucleus and whereas eukaryotes have membrane bound nucleus and cell organelles.

(2)Classification based on the number of cells includes organisms into unicellular which is made up of single cells or multicellular which is made up of numbers of cells.

11. What are the major divisions in the Plantae? What is the basis for these divisions?

Ans:

(1) Kingdom Plantae has been classified into mainly five major divisions which include, Bryophyta, Thallophyta, Gymnosperms, Pteridophyta, and Angiosperms.

(2)The five group of plants classified on the basis of following criteria:

Plant bodies that are differentiated or undifferentiated, vascular tissues that are present or absent, and plants with or without seeds; if seeds are present, they may be bare or inside the fruit.

12. How are the criteria for deciding divisions in plants different from the criteria for deciding the subgroups among animals?

Ans:

(1)Plants are divided on the basis of criteria like - Differentiated or Undifferentiated plant body, presence or absence of specialised vascular

tissues, with or without seeds and if seeds are present it may be naked seeds or present inside fruits

(2)In animals, division is broadly based on presence or absence of a notochord, level of organisation, number of cells etc.

13. Give three examples of the range of variations that you see in life-forms around you.

Ans: Examples observed in daily life are:

(1)Size- Different organisms show different sizes and it ranges from small bacteria to giant trees or giant animals.

(2)Appearance- Colour and texture of the skin, size and shape of body and other characteristics in different animal species are completely different from each other.

(3)Mode of nutrition- The main modes of nutrition in animals and plants are heterotrophic and autotrophic which are further divided into different forms. Different organisms show different modes of nutrition due to their different types of body structure and functions.

14. On what basis are plants and animals put into different categories?

Ans: Plants and animals are differentiate due to many features like:

(1) Chloroplasts-It is the main characteristic feature of plants because plants perform photosynthesis with the help of chloroplast whereas animals do not perform photosynthesis therefore chloroplasts are absent in their cells.

(2) Cell wall- Plants consist of a cell wall around their cell surface because it protects itself from wear and tear due to environmental stress whereas an animal does not due to flexibility movement by their body.

(3) Mode of nutrition is also considered as the characteristic feature that differentiate animals from plants. They can be classified into - Heterotrophs (Animals) which depend on other organisms for their food and Autotrophs (plants) which make their own food.

15. How are pteridophytes different from the phanerogams?

Ans: Difference between pteridophytes and phanerogams:

Pteridophyta	**Phanerogams**
It does not produce seeds due to less differentiated reproductive organs.	It produces seeds due to well developed reproductive organs.
Embryos are naked which are also known spores.	They produce seeds by reproductive process.
Example: Ferns, Marsilea, Equisetum, etc.	Example: Pinus, Cycas, fir, etc.

16. How do gymnosperms and angiosperms differ from each other?

Ans: Difference between Gymnosperm and Angiosperm:

Gymnosperm	Angiosperm
It produces naked seed because ovules are not enclosed by an ovary wall.	Seeds are present inside the fruit because ovules are enclosed by an ovary wall.
It mainly includes medium sized trees, small trees and shrubs.	It mainly includes all groups of plants.
Examples include Pinus, Cedar, fir, Cycas, etc.	Examples include Coconut, palm, mango, etc.

17. How do poriferan animals differ from coelenterate animals?

Ans: Difference between Porifera and Coelenterata:

Porifera	Coelenterate
Mostly marine, nonmotile, and present bottom in sea and ocean attached with rock.	They are marine animals which either live in colonies or solitary.
It has a cellular level of organisation.	It has a tissue level of organisation.
Examples: Spongilla, Euplectella, Sycon etc.	Examples: Hydra, sea anemone, corals, etc.

18. How do annelid animals differ from arthropods?

Ans: Difference between Annelids and Arthropods:

Annelids	Arthropods
Blood flow in well defined manner due to closed circulatory system	Blood does not flow in well defined manner due open circulatory system
Segments are present from head to tail.	Segments are present from neck to tail or in some it may be absent.
Small rings like setae are present.	Legs are joined.

19. What are the advantages of classifying organisms?

Ans: Advantages of classifications are,

(1) It makes the study of groups of organisms easy because due to high diversity it is impossible to study organisms one by one.

(2) The diversity not only includes different organisms but also it is present between different individuals of the same organism.

(3)Classification helps in grouping different species based on some observable similar characters and the Classification also helps in the identification and study of their evolutionary relationships.

20. What are the differences between amphibians and reptiles?

Ans: Difference between Amphibian and Reptiles:-

Amphibian	Reptiles
It shows dual nature like terrestrial and aquatic both.	They are mostly terrestrial.
Body surface is smooth due to the absence of scales.	Skin is rough due to the presence of scales, dry and cornified skin.
Show external fertilization in water and lay down eggs in water.	They show internal fertilization and lay down eggs on land.
It includes frogs, toads,salamanders etc.	It includes lizards, snakes, turtles, chameleons, etc.

21. What are the differences between animals belonging to the Aves group and those in the mammalia group?

Ans: Differences between animals belonging to the Aves group and those in the mammalia group:-

Aves	Mammals
Most of them fly due to presence of feathers	They can't fly due to the absence of feathers.
Beaks are present for eating food.	They eat with the help of teeth.
Fertilization leads to production of eggs. Hence, they are oviparous in nature.	Mostly they give birth to young ones but some of them lay eggs therefore it is both oviparous and viviparous.
Mammary glands are absent .	They produce milk therefore mammary glands are present

22. Explain the basis for grouping organisms into five kingdoms.

Ans:

(1)Many botanists and zoologists have done many attempts for classification of living organisms based on different characteristics. Out of all, the five kingdom classification done by R.H Whittaker (1969) is widely accepted and used even today.

(2)The five kingdoms' classification divide organisms into monera, protista, fungi, plantae and animalia based on the different characteristics.

(3)The different characteristics of organisms which differentiate five kingdoms are:

- Cell type- Based on the structure of the cells are divided into prokaryotes and eukaryotes.

● Cell wall- It differentiates organisms on the basis of presence or absence of cellulosic cell wall.
● Nuclear membrane- Some organisms show presence of nuclear membrane enclosing nucleus whereas some organisms like monerans do not have membrane bound nucleus.
● Body Organisation- It is based on the number of cells like some show cellular level of organisation, some have tissue level of organisation while higher animals have organ level of organisation.
● Mode of nutrition- On the basis of nutrition they are classified into autotrophs and heterotrophs.

23. Explain how animals in Vertebrates are classified into further subgroups.

Ans: Animals in Vertebrata are classified into following subgroups -

(1)Pisces- Show presence of exoskeleton of scales, endoskeleton of bone and cartilage and breathing take place through gills.

(2)Amphibia- It has presence of gills in the larval stage which get modified into lungs in the adult stage whereas skin in amphibians is slimy.

(3)Reptilia- It has the presence of dry skin, scales and scutes which make the skin surface rough and it lays eggs outside water.

(4)Aves- Exoskeleton consists of feathers, show flight movement and mostly lay eggs.

(5)Mammalia- Exoskeleton consists of hair, external ears and mammary glands are present. It gives birth to young ones.