Diversity in Living Organisms

Page No: 80

1. Why do we classify organisms?

Answer

There are millions of organisms on this earth. So, it is harder to study them one by one. Therefore, we look for similarities among them and classify them into different classes to study these different classes as a whole. Classification makes our study easier.

2. Give three examples of the range of variations that you see in lifeforms around you.

Answer

Examples of range of variations observed in daily life are: → Organisms vary greatly in size-from microscopic bacteria to elephants, whales and large trees.

→ The colour of various animals is quite different. Some worms are even colourless or transparent. Various types of pigments are found in plants. → The life span of different organisms is also quite varied. For example, a crow lives for only 15 years, whereas a parrot lives for about 140 years.

Page No: 82

1. 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?

Answer

The more basic characteristic for classifying organisms is the kind of cells they are made of because different organisms may share same habitat but may have entirely different form and structure. So, the place where they live cannot be a basis of classification.

2. What is the primary characteristic on which the first division of organisms is made?

Answer

The primary characteristic on which the first division of organisms is made is the nature of the cell – prokaryotic or eukaryotic cell.

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

Answer

Plants and animals are put into different categories on the basis of Mode of nutrition.Plants are autotrophs. They can make their food own while animas are heterotrophs which are dependent on others for food. Also, locomotion, absence of chloroplasts etc. make them different.

Page No: 83

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

Answer

A primitive organism is the one which has a simple body structure and ancient body design or features that have not changed much over a period of time.As per the body design, the primitve organisms which hav simple structures are different from those so-called advanced organisms which have complex body structure and organization.

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

Answer

Yes, because the advanced organisms also were like the primitive ones once. They have acquired their complexity relatively recently. There is a possibility that these advanced or 'younger' organisms acquire more complex structures during evolutionary time to compete and survive in the changing environment.

Page No: 85

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

Answer

The organisms belonging to Kingdom Monera are unicellular and prokaryotic whereas the organisms belonging to Kingdom Protista are unicellular and eukaryotic.

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

► Kingdom Protista

3. 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?

Answer

In the hierarchy of classification,a species will have the smallest number of organisms with a maximum of characteristics in common, whereas the kingdom will have the largest number of organisms.

Page No: 88

1. Which division among plants has the simplest organisms?

► Division Thallophyta

2. How are pteridophytes different from the phanerogams?

Answer

Pteridophyta	Phanerogams
They have inconspicuous or less differentiated reproductive organs.	They have well developed reproductive organs.
They produce naked embryos called spores.	They produce seeds.

Ferns, *Marsilea, Equisetum,* etc. are examples of pteridophyta.	*Pinus, Cycas*, fir, etc. are examples of phanerogams.

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

Answer

Gymnosperm	Angiosperm
They are non-flowering plants.	They are flowering plants.
Naked seeds not enclosed inside fruits are produced.	Seeds are enclosed inside fruits.
Pinus, Cedar, fir, *Cycas,* etc. are some examples of gymnosperms.	Coconut, palm, mango, etc. are some examples of angiosperms.

1. How do poriferan animals differ from coelenterate animals?

Answer

Porifera	Coelenterate
They are mostly marine, nonmotile, and found attached to rocks.	They are exclusively marine animals that either live in colonies or have a solitary life-span.
They show cellular level of organisation.	They show tissue level of organisation.
Spongilla, Euplectella, etc. are poriferans.	*Hydra,* sea anemone, corals, etc. are coelenterates.

2. How do annelid animals differ from arthropods?

Answer

Annelids	Arthropods
The circulatory system of annelids is closed.	Arthropods have an open circulatory system.
The body is divided into several identical segments.	The body is divided into few specialized segments.

3. What are the differences between amphibians and reptiles?

Answer

Amphibian	Reptiles
They have a dual mode of life.	They are completely terrestrial.
Scales are absent.	Skin is covered with scales.
They lay eggs in water.	They lay eggs on land.
It includes frogs, toads, and salamanders.	It includes lizards, snakes, turtles, chameleons, etc.

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

Answer

Aves	Mammals
Most birds have feathers and they possess a beak.	They do not have feathers and the beak is also absent.
They lay eggs. Hence, they are oviparous.	Some of them lay eggs and some give birth to young ones. Hence, they are both oviparous and viviparous.

Page No: 97

Excercise

1. What are the advantages of classifying organisms?

Answer

Following are the advantages of classifying organisms:

→ It makes us aware of and gives us information regarding the diversity of plants and animals.

→ It makes the study of different kinds of organisms much easier.

→ It tells us about the inter-relationship among the various organisms.

→ It helps us understanding the evolution of organisms.

→ It helps in the development of other life sciences easy.

→ It helps environmentalists to develop new methods of conservation of plants and animals.

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

Answer

We choose that characteristics which depends on the first characteristics and determines the rest variety.

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

Answer

The basis for grouping organisms into five kingdoms are:

→ Complexity of cell structure - There are two broad categories of cell structure: Prokaryotic and Eukaryotic. Thus, two broad groups can be formed, one having prokaryotic cell structure and the other having eukaryotic cell structure. Presence or absence of cell wall is another important characteristic.

→ Unicellular and multicellular organisms - This characteristic makes a very basic distinction in the body designs of organisms and helps in their broad categorizations.

→ Cell Wall: Presence and absence of cell wall leads into grouping.

→ Mode of nutrition -Organisms basically have two types of nutritions - autotrophic who can manufacture their own food and heterotrophic who obtain their food from external environment, i.e., from other organisms). Thus, organisms can be broadly classified into different groups on the basis of their mode of nutrition.

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

Answer

The major divisions in Kingdom Plantae are:

→Thallophyta

→ Bryophyta

→ Pteridophyta

→ Gymnosperms

→ Angiosperms

The following points constitute the basis of these divisions:

→ Whether the plant body has well differentiated, distinct components. → whether the differentiated plant body has special tissues for the transport of water and other substances.

→ The ability to bear seeds.

→ Whether the seeds are enclosed within fruits.

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

Answer

The characteristics used to classify plants is different from animals because the basic design are different, based on the need to make their own food (plants) or acquire food (animals).

Criteria for deciding divisions in plants are:

→ Differentiated/ Undifferentiated plant body
→ Presence/ absence of vascular tissues
→With/without seeds
→ Naked seeds/ seeds inside fruits

But the animals can't be divided into groups on these criteria. It is because the basic designs of animals are very different from plants. They are divided on the basis of their body structure.

6. Explain how animals in Vertebrata are classified into further subgroups.

Answer

Animals in Vertebrata are classified into five classes:

(i) Class Pisces: This class includes fish such as Scoliodon, tuna, rohu, shark, etc. These animals mostly live in water. Hence, they have special adaptive features such as a streamlined body, presence of a tail for movement, gills, etc. to live in water.

(ii) Class Amphibia: It includes frogs, toads, and salamanders. These animals have a dual mode of life. In the larval stage, the respiratory organs are gills, but in the adult stage, respiration occurs through the lungs or skin. They lay eggs in water.

(iii) Class Reptilia: It includes reptiles such as lizards, snakes, turtles, etc. They usually creep or crawl on land. The body of a reptile is covered with dry and cornified skin to prevent water loss. They lay eggs on land.

(iv) Class Aves: It includes all birds such as sparrow, pigeon, crow, etc. Most of them have feathers. Their forelimbs are modified into wings for flight, while hind limbs are modified for walking and clasping. They lay eggs.

(v) Class Mammalia: It includes a variety of animals which have milk producing glands to nourish their young ones. Some lay eggs and some give birth to young ones. Their skin has hair as well as sweat glands to regulate their body temperature.