

Q 1.

What are the advantages of classifying organisms?

SOLUTION:

The advantages of classifying organisms are as follows:

- (i) Classification facilitates the identification of organisms.
- (ii) It helps to establish the relationship among various groups of organisms.
- (iii) It helps to study the phylogeny and evolutionary history of organisms.
- (iv) By studying a few animals, the characteristics of the whole group can be known.

Q 2.

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

SOLUTION:

Before developing a hierarchy in classification, we need to decide which characteristics should be used as the basis for making the broadest divisions. Then we should pick up next set of characteristics for making sub-groups. This process must continue and each time new characteristics should be used. The characteristics that decide the broadest divisions among living organisms should be independent of any other characteristics. For example, nature of cell and form of the body is considered to classify organisms into broad divisions. The characteristics in the next level should be dependent on the previous one that will decide the subsequent divisions of the groups.

Q 3.

Explain the basis for grouping organisms into the five kingdoms.

SOLUTION:

Robert H. Whittaker proposed his five-kingdom classification on the following basis :

- (i) Phylogenetic relationship between organisms.
- (ii) Complexity of cell structure and body design.
- (iii) Mode of nutrition among organisms.

Q 4.

What are the major divisions in the plantae? What is the basis for these divisions ?

SOLUTION:

The major divisions of the kingdom Plantae are:

- Thallophyta
- Bryophyta
- Pteridophyta
- Gymnosperms
- Angiosperms

The first level of classification of plants is based on the presence and absence of well-differentiated distinct components in the body. Algae are separated from the rest in having simple and less differentiated thalloid plant body. The next level of classification is based on the presence and absence of vascular tissues (*i.e.*, xylem and phloem). This character separates bryophyta from the rest. Further classification is based on the ability to bear seeds. Pteridophyta do not bear seeds. Finally, the groups are made on the basis of seeds naked or enclosed within fruits. The gymnosperms have naked seeds whereas angiosperms bear seeds enclosed within the fruits.