The Living world

1
Chapter

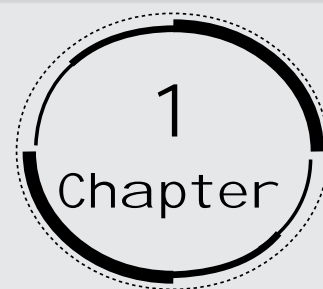## 1: Why are living organisms classified?

Ans: The classification of living organisms is done to make it easier to study the various living organisms as they have a huge diversity which makes it difficult to study them. By classification, the various living organisms are placed into various categories based on their common characteristics. Thus, classification helps the scientists and researchers to study them easily and in a systematic manner. The study of various living organisms will be beneficial for humankind as it will help in the discovery of various things that include new medicines, and also the introduction of better yielding varieties of crops. One more important factor that is responsible for us studying various living beings in a systematic manner is the protection of the environment. The classification is a minor term while taxonomy is a major term which is referred to as the branch of biology which includes the classification, identification, and nomenclature of living organisms.

2: Why are the classification systems changing every now and then?

Ans: The classification systems change according to the need as they arise. There are millions of plants, animals, and microorganisms found on earth while several new species have been identified by scientists every now and then. The world consists of huge numbers of species that are still left to be discovered. As they get discovered, they consist of new characters so they need to be classified by a new system of classification which needs to be prepared based on their characters. Thus, it results in the change in the previous system of classification leading to the formation of the new classification system.

3: What different criteria would you choose to classify people that you meet often?

Ans: When we meet different people daily in our day-to-day life then we classify and categorize them based on various physical and characteristic

features that include their level of education, their profession, their native place from where they belong, gender, physical features, etc.

4: What do we learn from the identification of individuals and populations?

Ans: India is a diverse country that involves individuals from various regions following different cultures, speaking different languages, wearing a variety of clothes, and having a diversity of food along with caste, religion, etc. Thus, by these traits and features, we can easily identify a huge variety of individuals.

5: Given below is the scientific name of Mango. Identify the correctly written name.

1. *Mangifera Indica*
2. *Mangifera indica*

Ans: The two names of an individual are called the binomial system of nomenclature, here the two name includes the generic name which is written first, its first letter must be written in the capital letter while the second name is the specific names whose first letter must be written in the small letter. Thus, the correct way to write the scientific name of Mango is *Mangifera indica.*

6: Define a taxon. Give some examples of taxa at different hierarchical levels.

Ans: A taxon is the classification of the living beings that are arranged on the basis of a particular level of hierarchy. Thus, the basic level of classification can be written as species, followed by genus, family, order, class, phylum, or division, all these categories are arranged in ascending order.

7: Can you identify the correct sequence of taxonomic categories?

(a) Species → Order → Phylum → Kingdom

(b) Genus → Species → Order → Kingdom

(c) Species → Genus → Order → Phylum

Ans: The correct sequence of taxonomic categories can be observed in the case of both (a) and (c) as the hierarchy includes Species, Genus, Family, Order, Phylum, and Kingdom that are arranged in an ascending manner. While in the case of option (b) Species need to be written first then Genus is to be written since species is the basic unit of classification. Thus, option (b) does not show the correct sequence of hierarchy.

8: Try to collect all the currently accepted meanings for the word species. Discuss with your teacher the meaning of species in the case of higher plants and animals on one hand and bacteria on the other hand.

Ans: Species generally is a biological term that means the basic unit of classification. It is the group that consists of organisms that are similar in character and can undergo the process of inbreeding among themselves even in natural conditions and then result in the formation of fertile offspring. Species are also found to be those organisms that have a similar gene pool as well.

9: Define and understand the following terms:
(i) Phylum (ii) Class (iii) Family (iv) Order (v) Genus

Ans: The definition of the following terms is:

(i) Phylum: Phylum is a group that consists of a group of closely related classes. For example, Phylum Chordata includes Pisces, amphibia, reptilia, aves, and Mammalia while there is no Phylum in the case of plants, instead, there is Division that includes classes with a few similar characters.

(ii) Class: The class is a group that consists of closely related orders. For example, the class Mammalia belongs to the orders Primata and Carnivora.

(iii) Family: Family is a group of individuals that are closely related genera. For example, Apes, Monkeys, and Man are related species that belong to the family Hominidae contains while in the case of plants, based on the vegetative and reproductive features the families are categorized.

(iv) Order: Order is composed of an individual that has closely related families. For example, Felidae and Canidae families are closely related and they belong to the order Carnivora.

(v) Genus: Genus includes the group of those species that are closely related to each other. For example, several species like *nigrum*, *melongena*, *tuberosum*, etc come under the genus *Solanum*.

10: Illustrate the taxonomic hierarchy with suitable examples of a plant and an animal.

Ans: Classification of a plant

As an example, let us classify Mango

• Class: Dicotyledons

• Order: Sapindales

• Family: Anacardiaceae

• Genus: *Mangifera*

• Species: *indica*

Classification of an animal

As an example, let us classify Humans

• Phylum: Chordata

• Class: Mammalia

• Order: Primata

• Family: Hominidae

• Genus: Homo

• Species: sapiens