CHAPTER

1

THE LIVING WORLD

CLASS 11TH

NCERT EXERCISE AND SOLUTIONS - BIOLOGY

Q. 1. Why are living organisms classified?

ANSWER:-

A vast array of plants, animals, and microbes inhabit the Earth, varying in size, shape, color, habitat, and other characteristics. Given the sheer number of living organisms, studying each one individually is impractical. To address this, scientists have developed classification systems based on specific rules and principles to identify, name, and categorize organisms systematically.

For instance, once an organism is identified as an insect based on certain principles, it is assigned a scientific name and grouped with similar organisms. These groups, or taxa, are formed by considering similarities and differences among organisms.

Biological classification not only simplifies the study of organisms but also reveals relationships between them, making the process of understanding biodiversity more organized and efficient.

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

ANSWER:-

The Earth is home to millions of plants, animals, and microorganisms. While many species have been identified by scientists, countless others are still being discovered worldwide. To accommodate these newly discovered species, updated classification systems must be developed periodically. This necessitates revising and improving the existing classification systems to incorporate new findings.

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

ANSWER:-

To classify a group of forty students, we can begin by dividing them based on gender, resulting in two primary groups: boys and girls.

Each of these groups can then be further categorized by the names of the students within them.

If multiple students share the same name, the classification can be refined by sorting them according to their surnames.

If duplicates still exist due to shared surnames, the final level of classification can be done using the roll numbers of the students, ensuring a unique identification for everyone.

Q. 4. **What do we learn from identification of individuals and populations?**

ANSWER:-

Understanding the characteristics of an individual or an entire population aid in identifying similarities and differences among individuals of the same species or between different organisms. This knowledge enables scientists to classify organisms into various categories effectively.

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

Mangifera Indica
Mangifera indica

ANSWER:-

In the binomial system of nomenclature, the genus name of a species always begins with a capital letter, while the species name starts with a lowercase letter. Thus, the correct scientific name for mango is *Mangifera indica*.

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

ANSWER:-

Each level or group in the classification system is called a taxon, which represents a specific rank. For instance, the basic classification level is species, followed by genus, family, order, class, phylum (or division), in increasing order. The highest classification level is the kingdom.

Q. 7. **Can you identify the correct sequence of taxonomical categories?**

(a) Species → Order → Phylum → Kingdom
(b) Genus → Species → Order → Kingdom
(c) Species → Genus → Order → Phylum

ANSWER:-

The correct hierarchical order of taxonomic categories, from lowest to highest, is Species → Genus → Family → Order → Class → Phylum → Kingdom. Thus, both (a) and (c) show the correct sequences of taxonomic categories. In sequence (b), genus should follow species, making it an incorrect order.

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

ANSWER:-

In biological classification, species is the fundamental taxonomic rank. It is defined as a group of similar organisms that can interbreed under natural conditions to produce fertile offspring. Thus,

individuals that are similar and reproductively isolated from others form a species. Species can also be described as a group of individuals sharing the same gene pool.

Q. 9. Define and understand the following terms:

(i) Phylum
(ii) Class
(iii) Family
(iv) Order
(v) Genus

ANSWER:-

(i) Phylum: A phylum is a major division of a kingdom, comprising one or more related classes of animals. In plants, the term "division" is used instead of phylum.

(ii) Class: A class is a taxonomic group that includes one or more related orders. For example, the class Mammalia encompasses several orders.

(iii) Family: A family is a taxonomic group containing one or more related genera. In plants, families are classified based on vegetative and reproductive characteristics.

(iv) Order: An order is a taxonomic group that includes one or more families. For instance, the order Carnivora includes various families.

(v) Genus: A genus is a taxonomic group that contains closely related species. For example, the genus *Solanum* includes several species, such as *nigrum*, *melongena*, and *tuberosum*.

Q. 10. Illustrate the taxonomical hierarchy with suitable examples of a plant and an animal.

ANSWER:-

The organization of different taxa in a ranked sequence is known as the taxonomic hierarchy. In this system, species occupy the lowest level, while the kingdom is at the highest level.

Kingdom
↑
Phylum or Divison
↑
Class
↑
Order
↑
Family
↑
Genus
↑
Species

Classification of a plant

As an example, let us classify *Solanum melongena* (Brinjal).

Kingdom – Plantae
Division – Angiospermae
Class – Dicotyledonae
Order – Solanales
Family – Solanaceae
Genus – *Solanum*
Species – *melongena*

Classification of an animal

As an example, let us classify *Columba livia* (Blue rock Dove).

Kingdom – Animalia
Phylum – Chordata
Class – Aves
Order – Columbiformes
Family – Columbidae
Genus – *Columba*
Species – *livia*