1. The living world

Question 1. Why are living organisms classified?

Answer: There are a large number of plants, animals and microbes on the earth and they might differ in size, shape, colour , adaptations, and many more characters. Studying each of them independently is different, therefore scientists have developed mechanisms to classify the organisms on the basis of certain rules and principles. On the basis of rules, the organisms are classified into different groups.

For example, on the basis of presence of three pairs of legs and two pairs of wings, the organism can be identified as an insect.
Classification helps in establishing and revealing the relationship between the different organisms.

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

Answer: There are millions of plants, animals and microorganisms on the earth. Many of the species have been identified while some of them are still being discovered. New species are constantly evolving with new characteristics, new classification has to be devised every now and then. At first, the classification was based on morphology and after morphology, embryology was taken into account, then phylogenetic relationship and cytology were considered. The latest classification method considers biochemical techniques to classify the organisms on the basis of the nucleic acid structure

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

Answer: The criteria for classification will be based on first, their name and morphological characters such as skin colour, height, sex. Other than morphology, we can consider education, profession, area,hobbies.

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

Answer: By the identification of individuals and populations we can learn about their native place, mother tongue, costumes, food habit, religion, caste , etc. We learn about the scientific names and description of the organisms. The similarities and dissimilarities helps the scientists to classify organisms in the different groups.

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

Mangifera Indica
Mangifera indica

Answer: The correct option is *Mangifera indica* where, Mangifera is the genus and indica is the species. The genus name starts with capitalised alphabet and species name starts with lowercase alphabets. Both genus and species name must be italic.

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

Answer: Unit or category of classification is known as a taxon. It is a level or rank. The basic level is species while the highest level is kingdom.

The taxa at different hierarchical levels are:

　　　　a.　Kingdom

b. Phylum

c. Class

d. Order

e. Family

f. Genus

g. Species

Question 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: (a) and (c) signify the sequence from bottom to the topmost hierarchy.

Question 8. Try to collect all the currently accepted meaning 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: Species are the organisms having same type of characters and features which are grouped together.

A group of individuals having fundamental similarities are called species. For example, *Panthera leo* and *Panthera tigris* , where *Panthera* is the genus but *leo* and *tigris* are species.

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

Answer:

I. Phylum: It is the second highest unit of classification after the Kingdom. It possesses one or more related classes of animals. The term 'division' can also be used.

II. Class: It is a taxonomic group having one or more related orders. For example,

presence of notochord. Class Mammalia includes orders like Primates, carnivora and so on.

III.   Family: Taxon having the organisms with similar genera. It has one or more related genera. For example, families can be categorised on the basis of vegetative and reproductive features.

IV.   Order: The taxa having one or more related families. The order carnivora has many families.

V.   Genus: It is a group of similar and related species which have many characters in common. It is placed above the species and below the family.

Question 10. How is a key helpful in the identification and classification of an organism?

Answer: Key is a lead which is a type of taxonomical aid which helps in identifying plant and animal species. The keys are based on similarities and dissimilarities . It generally occurs in couplet. It can also identify unknown organisms.

Keys can be of two types – indented and bracketed. Indented keys provide the order of choices between two or more statements while in bracketed key, a pair of contrasting characters is used.

Question 11. Illustrate the taxonomical hierarchy withsuitable examples of a plant and animal.

Answer: The table provides an example of taxonomical hierarchy as mango and frog as an example.

Taxonomic categories	Mango	Frog
Kingdom	Plantae	Animalia
Phylum	Angiospermae	Chordata

Class	Dicotyledonae	Amphibia
Order	Sapindales	Anura
Family	Anacardiaceae	Ranidae
Genus	Mangifera	Rana
Species	*indica*	*temporaria*