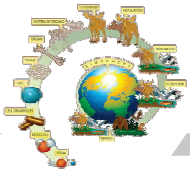

Chapter - 1

The Living World

Points to Remember

1. Organism (Microorganism, plant and animals) who posseses life is living.
2. Life is a complex organisation expressing itself through chemical reactions and exhibit characteristics of living organisms.
3. **Characteristics of Living Organisms :** Growth, reproduction, metabolism, cellular organisation, consciousness, self-replication and self regulation.
   - Reproduction and growth are NOT defining properties.
   - Metabolism (catabolism + anabolism), cellular organisation and consciousness are defining properties.
   - Living organisms are self-replicating, evolving, self-regulating and interactive systems capable of responding to external stimuli.
4. **Biodiversity :** The term used to refer to the variety of microorganisms, plants and animals on earth.
5. **Need for classification :** To organise the vast number of microorganisms, plants and animals into categories that could be named, remembered, studied and understood.
6. **Taxonomy :** Study of principles and procedures of identification, nomenclature and classification.
7. **Systematics :** It deals with classification of organisms based on their diversities and relationships among them. The term was proposed by Carolus Linnaeus who wrote *'Systema Naturae'*.
8. **Concept of Species :** Group of organisms that can interbreed naturally among themselves and can produce fertile offsprings are the members of same species. This is the biological concept of species proposed by Mayr.
9. **Taxa :** Each category (*i.e.,* unit) of classification is called as a taxon.
10. **Taxonomic Hierarchy :** Classification of organisms in a definite sequence of taxon or category or rank in a descending order.

    Kingdom → Phylum /Division → Class → Order → Family → Genus → Species.

11. **Binomial Nomenclature :** Given by Carolus Linnaeus. Each scientific name has two components-Generic name + Specific epithet.
12. **ICBN :** International Code for Botanical Nomenclature (for giving scientific name to plants.)
13. **ICZN :** International Code of Zoological Nomenclature (for giving scientific name to animals.)
14. **Rule for Nomenclature :**
    - Latinised names are used.
    - First word is genus, second word is species name.
    - Printed in italics; if handwritten then underlined separately.
    - First word of Genus starts with capital letter while species name starts with small letter.
15. - **Scientific names of some organisms :**

Man	—	*Homo sapiens*
Housefly	—	*Musca domestica*
Mango	—	*Mangifera indica*
Wheat	—	*Triticum aestivum*

16. Taxonomical aids are the tools for study of taxonomy.
17. Museums in educational institutes (school and colleges) have collection of skeletons of animals, stuffed and preserved specimens of organisms for study and reference.
18. Zoological Parks (Places where wild animals are kept in protected environment under human care) Example : National Zoological Park, Delhi.
19. **Herbarium :** Store house of dried, pressed and preserved plant specimen on sheets, kept systematically according to a widely accepted system of classification, for future use.
20. **Botanical Garden :** Collection of living plants for reference.

    Example : Royal Botanical garden Kew (England), National Botanical Research Institute (Lucknow), Indian Botanical Garden (Howrah, Kolkata).
21. **Keys :** Used for identification of plants and animals on the basis of similarities and dissimilarities two types : Indented key, Bracketed key.
22. **Couplet :** the two alternate characteristic statement used in key to identify organisation.
23. Each Statement of the key is called a *lead*.
24. - Flora Index to plant species found in a particular area.

25. ● Manuals Provide information for identification of name of species in an area. It is a handy book.

26. ● Monographs Contain information on any one taxon.

Question

(SRT) Select Response Type Question (1 mark each)

1. Which of the following botanical garden is the home for great banyan tree?
   (a) Acharya Jagadish Chandra Bose Indian Botanical Garden
   (b) Narendra Narayan Park
   (c) Jawaharlal Nehru Tropical Botanic Garden and Research Institute
   (d) Agri Horticultural Society of India
2. Study about different kinds of organisms and their diversities along with the relationships among them, is called .....
   (a) Nomenclature (b) Systematics
   (c) Taxonomic hierarchy (d) Classification
3. Which of the following is not a taxon?
   (a) Genus (b) Order
   (c) Taxonomic key (d) Family

CONSTRUCTED RESPONSE TYPE (CRT)

Very Short Answer Questions (1 mark each)

4. Define species.
5. Define Life.
6. Name two genus belonging to family Felidae.
7. **Assertion:** In planaria larva, a fragmented organism regenerates the lost body part of its body and becomes, a new organism.

   Reason: Reproduction is defining feature of life forms.

   (a) Both assertion and reason are true, and the reason is the correct explanation of the assertion.

(b) Both assertion and reason are true, but the reason is not the correct explanation of the assertion.

(c) Assertion is true but reason is false.

(d) Both assertion and reason are false.

Short Answer Question-I (2 marks each)

8. What are the basis of modern taxonomical studies ?
9. Why growth and reproduction cannot be taken as defining property of all living organisms ?
10. How are museum different from zoological parks?
11. Discuss the advantages of assigning a scientific name to living organism.
12. How systematics is different from taxonomy?
13. Write two significances of taxonomical aids.
14. Explain the concept of species given by Ernst Mayr.

Short Answer Question-II (3 marks each)

15. What is the difference between Botanical Garden and Herbarium ?
16. Keys are analytical in nature and are helpful in identification and classification of organisms. How ?
17. Define : (a) Genus (b) Family (c) Order
18. Write the taxonomic categories showing hierarchal arrangement in ascending order.
19. What are botanical gardens? Mention names of three famous botanical gardens.
20. Write a short note on flora, manual, monograph and catalogue.

Long Answer Questions (5 marks each)

21. What are the universal rules of nomenclature ? What does 'Linn.' refer to in *Mangifera indica* Linn ?
22. Illustrate taxonomical hierarchy with suitable examples from plant and animal species.
23. Define classification. What is the significance of classification ?
24. What is herbarium? How is it prepared? Mention the information that a label of herbarium sheet carry. What is the advantage of herbarium sheets?

Answers

(SRT) Select Response Type Question (1 mark each)

1. (a) 2. (b) 3. (c)

CONSTRUCTED RESPONSE TYPE (CRT)

Very Short Answers (1 marks each)

4. Group of organisms that can interbreed naturally to produce fertile offspring.
5. Life is unique, complete complex functioning of metabolic activities to exhibit characteristics of living organisms.
6. *Felis* and *Panthera*.
7. (c)

Short Answers-I (2 marks each)

8. External and internal structure, structure of cell, development process and ecological information.
9. - Non-living things can also increase in mass by accumulation of material on surface (accretion.)
   - Many organisms do not reproduce (*e.g.,* mules, sterile worker bees.)
10. Refer point to remember on page no. 2.
11. The scientific name ensures that each organism has only one name. Description of any organism should enable the people to arrive at the same name. They also ensure that such a name has not been used for any other known organism.
12. Refer to point to remember on page no. 1.
13. They help in correct classification and identification of organisms. These are fundamental to studies and essential for training in systematics.
14. Refer to point to remember on page 2.

Short Answers-II (3 marks each)

15. Botanical Garden : Collection of living plants.

Herbarium : Collection of dried, pressed and prerserved plant specimens on sheets.

16. Key is a list of alternate characters arranged in such a manner that by acceptance and rejection one can easily identify an organisms as to its name and position. Keys are generally analytical in nature.

17. (a) Genus : Group of related species;

    (b) Family : Group of related genera;

    (c) Order : Group of related families.

18. Species, genus, family, order, class, phylum/division, kingdom.

19. Refer to points on page 2.

20. Refer to points on page 3.

(CRT) Long Answers (5 marks each)

21. Refer to points to remember.

    'Linn.' indicates that the species was first described by Linnaeus.

22. Refer table 1.1, page no. 11, NCERT, Text Book of Biology for Class XI.

23. Grouping organisms on the basis of their similarities and differences. Significance : – Aids in study, better understanding, predicting the features of the group known.

24. Refer page no. 11, NCERT, Text book of Biology class XI.