

Chapter-1

THE LIVING WORLD

POINTS TO REMEMBER

Characteristics of Living Organisms : Growth, reproduction, metabolism, cellular organisation, consciousness (ability to sense environment), self-replicating and self regulation.

- Reproduction and growth are NOT defining properties.
- Metabolism, cellular organisation and consciousness are defining properties.

Biodiversity : Term used to refer to the variety of plant and animals on earth.

Need for classification : To organise the vast number of plants and animals into categories that could be named, remembered, studied and understood.

Rules for Nomenclature : • Latinised names are used.

- First word is genus, second word is species name.
- Printed in italics; if handwritten then underline separately.
- First word starts with capital letter while species name written in small letter.

ICBN : International Code of Botanical Nomenclature (for giving scientific name to plants.)

ICZN : International Code of Zoological Nomenclature (for giving scientific name to animals.)

Taxa : Each category (i.e. unit) classification is called as a taxon.

Taxonomy : Study of principles and procedures of classification.

Binomial Nomenclature : Given by Carolus Linnaeus. Each scientific name has two components - Generic name + Specific epithet.

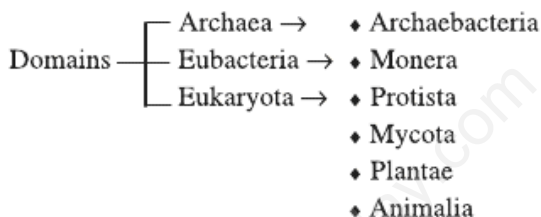
Systematics : It deals with classification of organisms based on their diversities and relationships among them. Term was proposed by Carolus Linnaeus who wrote 'Systema Naturae'.

Taxonomic Hierarchy : Arrangement of various steps (categories or taxa) in a hierarchy of classification.

Species → Genus → Family → Order → Class → Phylum (for animals) / Division (for plants) Kingdom.

Species : All the members that can interbreed among themselves and can produce fertile offsprings are the members of same species. This is the biological concept of species proposed by Mayr.

Three Domains of Life : Proposed by Carl Woese in 1990 who also proposed the six kingdom classification for living organisms. The three Domains are Archaea, Bacteria and Eukarya.



Herbarium Store house of dried, pressed and preserved plant specimen on sheets.

Botanical Garden : Collection of living plants for reference.**

****Examples** : Kew (England), National Botanical Research Institute (Lucknow), Indian Botanical Garden, Howrah.

Taxonomical aids Zoological Park (Places where wild animals are kept in protected environment)

- ♦ Keys (Used for identification of plants and animals on the basis of similarities and dissimilarities.)
- ♦ Flora (Index to plant species found in a particular area.)
- ♦ Manuals (Provide information for identification of name of species in an area.)
- ♦ Monograph (Contain information on one taxon.)

QUESTIONS

Very Short Answer Questions (1 mark each)

1. Define species.
2. What is systematics ?
3. Give the names of two famous botanical gardens.

Short Answer Questions-II (2 marks each)

4. What is the basis of modern taxonomical studies ?

5. Why growth and reproduction cannot be taken as defining property of all living organisms ?
6. How is a taxon (pl. taxa) defined ?

Short Answer Questions-I (3 marks each)

7. What is the difference between Botanical Garden and Herbarium ?
8. Keys are analytical in nature and are helpful in identification and classification of organisms. How ?
9. Define : (a) Genus (b) Family (c) Order

Long Answer Questions (5 marks each)

10. What are the universal rules of nomenclature ? What does 'Linn.' refer to in *Mangifera indica* Linn. ?
11. Illustrate taxonomical hierarchy with suitable examples from plant and animal species.

ANSWERS

Very Short Answers (1 mark each)

1. Members that can interbreed to produce fertile offspring.
2. Systematic arrangement which also takes into account evolutionary relationships between organisms.
3. Kew (England) and National Botanical Research Institute (Lucknow), Indian Botanical Garden (Howrah).

Short Answers-II (2 marks each)

4. External and internal structure, structure of cell, development process and ecological information.
5. • Non-living things can also increase in mass by accumulation of material on surface.
• Many organisms do not reproduce (*e.g.*, mules, sterile worker bees).
6. Each category in a taxonomical hierarchy represents a rank and is called taxon.

Short Answers-I (3 marks each)

7. Botanical Garden : Collection of living plants.
Herbarium : Collection of dried, pressed and preserved plant specimens on sheets.
8. Refer page no. 13, NCERT, Text Book of Biology for Class XI.
9. Genus : Group of related species; Family : Group of related genera; Order : Group of related families.

Long Answers (5 marks)

10. Refer page no. 7, NCERT, Text Book of Biology for Class XI.
'Linn.' indicates that the species was first described by Linnaeus.
11. Refer table 1.1, page no. 11, NCERT, Text Book of Biology for Class XI.