

NCERT Exemplar Solutions of Class 11 Biology – Chapter: 1 The Living World.

VERY SHORT ANSWER TYPE QUESTIONS

1. Linnaeus is considered as Father of Taxonomy. Name two other botanists known for their contribution to the field of plant taxonomy?

Solution:

George Bentham and **Joseph Dalton Hooker** are known botanists who gave the natural system of classification of flowering plants. Their system, known as the Bentham and Hooker system, was based on natural affinities and is still used in many herbaria worldwide.

2. What does ICZN stand for?

Solution:

ICZN stands for **International Code of Zoological Nomenclature**. It regulates a uniform system of zoological nomenclature and provides rules for naming animals to ensure consistency and avoid confusion in scientific names.

3. Couplet in taxonomic key means _____.

Solution:

The taxonomic key provides a certain structure on the basis of which the user can sort out the taxonomic position of the unknown species. **Couplet** means a **pair which consists of contrasting characters** of an organism. Each couplet presents two contradictory choices that help in identification.

4. What is Monograph?

Solution:

A monograph is a detailed description of a single taxon or a group of closely related taxa. It contains comprehensive information about the morphology, anatomy, embryology, cytology, and other aspects of the organism(s) being studied.

5. Amoeba multiplies by mitotic cell division. Is this phenomenon growth or reproduction?

Explain.

Solution:

Amoeba is a single-celled organism; its growth through mitosis is the **same as reproduction** since it divides to give rise to a new individual. In unicellular organisms, **mitosis serves both growth and reproduction** - the parent cell divides to form two daughter cells, effectively reproducing.

6. Define metabolism.

Solution:

Metabolism is defined as the **sum total of all biochemical reactions taking place within any living organism** to sustain and maintain life. It includes both anabolic (constructive) and catabolic (destructive) processes.

7. Which is the largest botanical garden in the world? Name a few well-known botanical gardens in India.

Solution:

The world's largest botanical garden is situated in London which is known as **Kew Royal Gardens**.

Well-known botanical gardens in India:

1. Sanjay Gandhi Jaivik Udyan in Patna
2. Hyderabad Botanical Garden
3. NTR Garden, Hyderabad
4. Botanical Garden Sarangpur
5. Cubbon Park, Bangalore

SHORT ANSWER TYPE QUESTIONS

1. A ball of snow when rolled over snow increases in mass, volume and size. Is this comparable to growth as seen in living organisms? Why?

Solution:

No, the growth in case of a snowball is completely different from biological growth. This happens due to **extrinsic growth** by the deposition of the same material from outside. In contrast, biological growth is **intrinsic** - it occurs from within the organism through cell division and cell enlargement, involving metabolic processes and increase in protoplasm.

2. In a given habitat we have 20 plant species and 20 animal species. Should we call this 'diversity' or 'biodiversity'? Justify your answer.

Solution:

This should be called '**biodiversity**'. **Biodiversity** refers to the total variety of living organisms present in a particular area, whereas **diversity** is a broader term that may be used for both living and non-living things and typically refers to larger geographical areas.

3. International Code of Botanical Nomenclature (ICBN) has provided a code for classification of plants. Give hierarchy of units of classification botanists follow while classifying plants and mention different 'Suffixes' used for the units.

Solution:

Hierarchy followed in plants:

Species → Genus → Family → Order → Class → Division → Kingdom

Taxon	Suffix	Example
Division	-phyta	Angiospermatophyta
Class	-ae	Dicotyledonae
Order	-ales	Polymoniales
Family	-aceae	Solanaceae

4. A plant species shows several morphological variations in response to an altitudinal gradient. When grown under similar conditions of growth, the morphological variations disappear and all the variants have common morphology. What are these variants called?

Solution:

These variants are called '**ecotypes**'. Plants show changes in morphological features in response to different environmental conditions like altitude, temperature, and humidity. However, these changes are **phenotypic** (environmental) rather than **genotypic** (genetic), which is why they disappear when grown under uniform conditions.

5. How do you prepare your herbarium sheets? What are the different tools you carry with you while collecting plants for the preparation of a herbarium? What information should a preserved plant material on the herbarium sheet provide for taxonomical studies?

Solution:

Preparation of herbarium sheets:

1. Cut paper to desired size (e.g., 29 × 41 cm)
2. Mount dried specimen on sheets with glue or sellotape
3. Attach labels underneath each specimen

Collection tools:

1. Digger
2. Knife and Scissors
3. Newspaper
4. Blotting sheet
5. Plant press
6. Notebook
7. Magnifying glass

Information provided:

1. Scientific name of the specimen
2. Taxonomical details
3. Common name
4. Collector's name
5. Place of collection
6. Date and time of collection

6. What is the difference between flora, fauna and vegetation? Eichhornia crassipes is called an exotic species while Rauwolfia serpentina is an endemic species in India. What do these terms exotic and endemic refer to?

Solution:

Definitions:

- **Flora:** Plant life occurring in a particular region or time
- **Fauna:** Animal life found in a particular region or time
- **Vegetation:** Plant forms in an area, not including specific taxonomic details

Species types:

- **Exotic species:** Non-native species living outside their natural habitat (e.g., Eichhornia crassipes - water hyacinth from South America)
- **Endemic species:** Species native and restricted to a particular geographical area (e.g., Rauwolfia serpentina - native to India)

7. A plant may have different names in different regions of the country or world. How do botanists solve this problem?

Solution:

Botanists solve this problem by using **scientific nomenclature** - giving each plant a **universal scientific name** that remains the same worldwide. For example, mango is scientifically named *Mangifera indica*. While it may be called "Aam" in Hindi, "Ma" in Tamil, or "Mango" in English, its scientific name remains constant globally, eliminating confusion.

8. Brinjal and potato belong to the same genus *Solanum*, but are two different species. What defines them as separate species?

Solution:

They are defined as separate species based on **reproductive isolation**. Although they share the same genus *Solanum*, they cannot interbreed to produce fertile offspring. Species are groups of organisms that can reproduce among themselves and produce fertile offspring, but cannot do so with members of other species.

9. Properties of cell organelles are not always found in the molecular constituents of cell organelles. Justify.

Solution:

This phenomenon occurs due to **emergent properties** arising from underlying interactions between molecules. The properties of cellular organelles emerge from the **organization and interaction** of their molecular constituents rather than being present in individual molecules. For example, a mitochondrion produces ATP, but individual proteins within it cannot perform this function alone.

10. The number and kinds of organisms are not constant. How do you explain this statement?

Solution:

Several factors cause changes in organism populations:

- **Seasonal variations:** Affect organism abundance
- **Extinction:** Species disappear naturally or due to human activities
- **Human activities:** Deforestation, pollution, habitat destruction
- **Evolution:** New species emerge, existing ones change
- **Migration:** Organisms move between habitats