Class : VII
Subject : Biology
Topic : 4. CELL AND MICRONES: BUILDING BLOCKS TO INVISIBLE WORLD

I) VERY SHORT ANSWERS:

1.Define a cell.

Ans: A cell is the smallest living unit and the basic building block of life that makes up every living organism.

2. **Name four major groups of microorganisms mentioned in the text.**

Ans: Bacteria, fungi, algae, and protozoa.

3**. What are the basic life functions carried out by cells?**

Ans: Taking in food, releasing energy, removing wastes, growing, and dividing to produce new cells.

4.What is cell biology or cytology?

Ans: It is the scientific study of cells, their structural parts, and the functions that those parts perform.

5. Name the smallest and the largest single cells known:

Ans: Smallest: *Mycoplasma* about 0.1 to 0.3 micrometers
Largest: The **ostrich egg**.

6. What is the typical size range of a bacterium compared to a plant or animal cell?

Ans: Bacterium: Usually 1- 5 micrometer
Plant/Animal cell: Usually 10 - 100 micrometer

7. What three main components do most cells have inside them?

Ans: Most cells contain a **cell membrane**, **cytoplasm**, and **genetic material (DNA)**.

8. What is the function of the cell membrane (plasma membrane)?

Ans: It **controls what enters and leaves** the cell.

9. What is cytoplasm and what happens there?

Ans: It is a **jelly-like fluid** inside the cell where vital chemical reactions take place.

10. What is the role of genetic material (DNA) in a cell?

Ans: It **stores instructions** for the cell's activities and growth.

11.**How do prokaryotic cells reproduce?**
Ans: Most prokaryotic cells reproduce asexually by a simple form of cell division called **binary fission**.

12. **What three components make up the "common toolkit for life" shared by both plant and animal cells?**
Ans: Both plant and animal cells share a basic common plan consisting of:

1. **Cell membrane**
2. **Cytoplasm**
3. **Ribosomes**

13. List three features that are uniquely found in plant cells but absent in animal cells.
Ans: Plant cells uniquely possess:

- A rigid outer **cell wall**.
- A large **central vacuole**.
- **Chloroplasts** (used for photosynthesis).

14. What organelle is often present in animal cells to help with cell division, but is missing in plant cells?

Ans: Centrioles are often present in animal cells to aid in cell division but are generally absent in plant cells.

15. What carries hereditary information from one generation to the next inside a cell?
Ans: DNA carries hereditary information inside a cell.

16. What is formed when cells of a similar kind group together?
Ans: A group of similar cells forms a **tissue**.

17. Give an example of an organ system mentioned in the text.
Ans: The **digestive system** (or circulatory/respiratory system).

II. SHORT ANWER TYPE:

1. What is the difference between unicellular and multicellular organisms?
Ans: Unicellular organisms consist of a single cell that performs all necessary life jobs. Multicellular organisms are made of many cells that specialize to form tissues and organs.

2. **Give two examples of how microbes can be helpful and two examples of how they can be harmful.**
Ans: Helpful: Food making and decomposition.

Harmful: Causing disease and food spoilage.

3. **Who discovered cells, and how?**
Ans: Robert Hooke discovered cells in 1665 by examining a thin slice of cork under a simple microscope, where he observed tiny, box-like spaces.

4.What are unicellular organisms? Give examples.
Ans: Organisms that are made up of only **one single cell** that performs all necessary life activities. Examples include many bacteria, *Amoeba*, and Yeast.

5. **What are multicellular organisms? Give examples.**
Ans: Organisms that consist of **many cells** that often become specialized for different tasks. Examples include humans, neem trees, and earthworms.

6. **How does the organization of life differ between unicellular and multicellular organisms?**
Ans: In unicellular organisms, a single cell manages all activities. In multicellular organisms, the organization follows a hierarchy: **Cell - Tissues - Organ System - Complex Organism**.

7. What are the two main types of cells? Give examples of each.
Ans: The two main types of cells are:

- **Prokaryotic cells:** Examples include bacteria and archaea.
- **Eukaryotic cells:** Examples include plants, animals, fungi, and protozoa

8. State any two major functions or significance of cells in a living organism.
Ans: Two major functions of cells are:

- They provide **structural support** to the body.
- They **process nutrients** to release vital energy.

9. Explain how organs are formed from the basic unit of life.
Ans: Cells of a similar kind combine to form **tissues**. These tissues then group together to build an **organ** that performs a specific function in the body.

III) LONG ANSWERS:

1.**State the key differences between prokaryotic cells and eukaryotic cells.**

Ans:

Feature	Prokaryotic Cell	Eukaryotic Cell
Nucleus	Lacks a true, membrane-bound nucleus.	Has a true nucleus surrounded by a nuclear membrane.
DNA Location	Located in an open region called the **nucleoid**.	Located safely inside the nucleus.
Size	Very small, typically **\(0.1 - 5\ \mu\text{m}\)**.	Generally larger, typically **\(10 - 100\ \mu\text{m}\)**.
Organelles	Lacks membrane-bound organelles.	Contains membrane-bound organelles (e.g., mitochondria, vacuoles).

2. Differences between Plant Cell and Animal Cell.

Ans:	**Plant Cell**	**Animal Cell**
1..	It has a cell wall	It does not have a cell wall
2.	It usually has a fixed, rectangular shape	It usually has a round or irregular shape.
3.	It contains chloroplasts in green parts, which help in photosynthesis. _	It does not contain chloroplasts.

4.	It usually has one large central vacuole.	It usually has small vacuoles or none that are prominent
5.	It stores food mainly as starch.	It stores food mainly as glycogen.
6.	It is found in plants.	It is found in animals.