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CELL— STRUCTURE AND FUNCTIONS

[Document subtitle]

SCIENCE

CLASS: - 8TH

Education Source

Chapter: 8th
CELL— STRUCTURE AND FUNCTIONS

Exercise

Q1: Indicate whether the following statements are True (T) or False (F).

(a) Unicellular organisms have one-celled body. (T)

(b) Muscle cells are branched. (F)

(c) The basic living unit of an organism is an organ. (F)

(d) Amoeba has irregular shape. (T)

Q2: Make a sketch of the human nerve cell. What function do nerve cells perform?

Ans: - Function of nerve cell: -

(a) Communication: Transmitting signals and messages throughout the body.

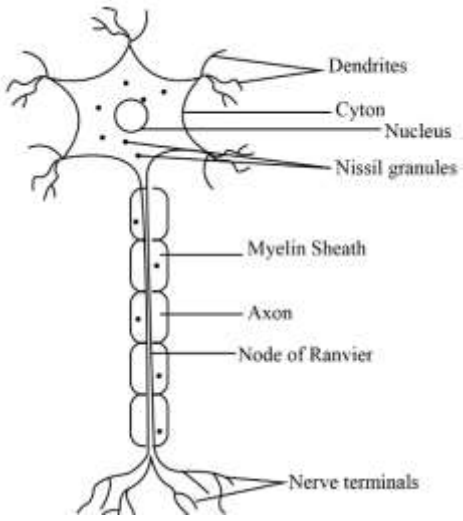
(b) Sensory input: Receiving and converting sensory information.

(c) Integration: Processing and combining incoming information.

(d) Signal transmission: Sending electrical impulses along the neurons.

(e) Memory and learning: Forming and storing memories, facilitating learning.

(f) Motor control: Controlling muscle contractions and movement.



Q3: Write short notes on the following.

(a) Cytoplasm

(b) Nucleus of a cell

Ans:

(a) Cytoplasm: - Gel-like substance within a cell, fills the space between the cell membrane and nucleus. It houses various organelles and is involved in metabolic processes such as protein synthesis and energy production. The cytoplasm provides a medium for molecular movement and supports intracellular transport.

(b) Nucleus of a cell: - Central organelle enclosed by a nuclear membrane, containing DNA organized into chromosomes. It serves as the control centre, regulating gene expression and directing cellular activities. The nucleus is involved in DNA

replication, repair, and the formation of the nucleolus, which produces ribosomes.

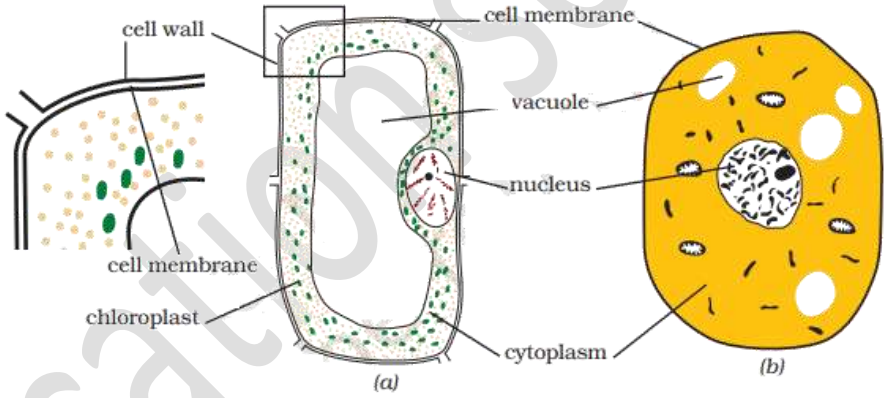
Q4: Which part of the cell contains organelles?

Ans: The cytoplasm is the part of the cell that contains organelles. Organelles are specialized structures within a cell that perform specific functions. Examples of organelles found in the cytoplasm include mitochondria, endoplasmic reticulum, Golgi apparatus. These organelles are suspended within the cytoplasm and carry out various essential processes for the cell's survival and functioning.

Q5: Make sketches of animal and plant cells. State three differences between them.

Ans: - Three differences between animal and plant cells are: -

Plant cells	*Animal Cell*
1. ***Presence of cell wall.***	Absence of cell wall
2. ***Presence of Chloroplasts***	Absence of Chloroplasts
3. ***Large central vacuole***	Small or multiple vacuoles



(a) plant cell and (b) animal cell

Q6: State the difference between eukaryotes and prokaryotes.

Ans: The difference between eukaryotes and prokaryotes are: -

Eukaryotes	*Prokaryotes*
1. *Nucleus present, with a well-defined nuclear membrane*	Nucleus Absent, DNA is found in the nucleoid
2. *Membrane-bounded organelles are present*	Lack of membrane-bound organelles
3. *Larger in size and more complex*	Smaller in size and simpler
4. *Can undergo both asexual and sexual reproduction*	Mainly reproduce through asexual binary fission

Q7: Where are chromosomes found in a cell? State their function.

Ans: Chromosomes are found within the nucleus of a cell. They are structures composed of DNA tightly coiled around proteins called histones.

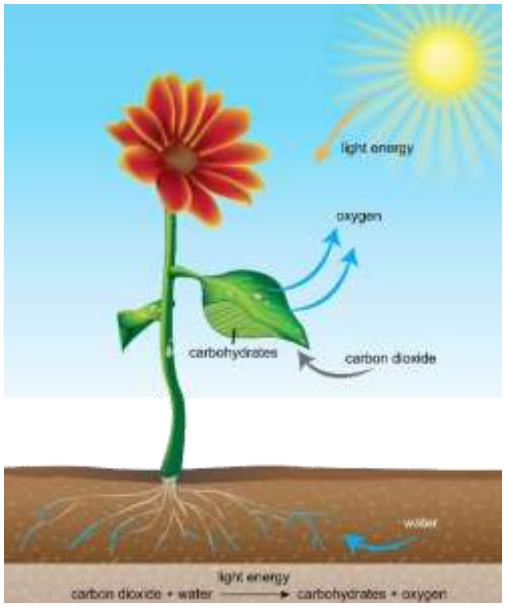
The function of chromosomes is to carry and organize the genetic information in the form of genes. During cell division, chromosomes condense and become visible, facilitating the accurate distribution of genetic material to daughter cells. Chromosomes contain the instructions necessary for the development, growth, and functioning of an organism.

Q8: Cells are the basic structural units of living organisms. Explain.

Ans: Cells are the basic units that make up living organisms. They are responsible for carrying out essential functions and maintaining the structure of the organism. New cells are generated from existing cells through cell division. Cells work together to form tissues, organs, and systems, ensuring the proper functioning and survival of the organism. In summary, cells are the fundamental building blocks of life and the cornerstone of biological organization.

Q9: Explain why chloroplasts are found only in plant cells?

Ans: Chloroplasts are exclusively found in plant cells because they house a green pigment called chlorophyll. This pigment plays a crucial role in photosynthesis and imparts a green colour to leaves. By capturing solar energy, chlorophyll enables plants to convert sunlight into food, facilitating their growth and survival. The presence of chloroplasts and chlorophyll is a distinctive feature of plant cells, allowing them to harness light energy for the synthesis of organic molecules.

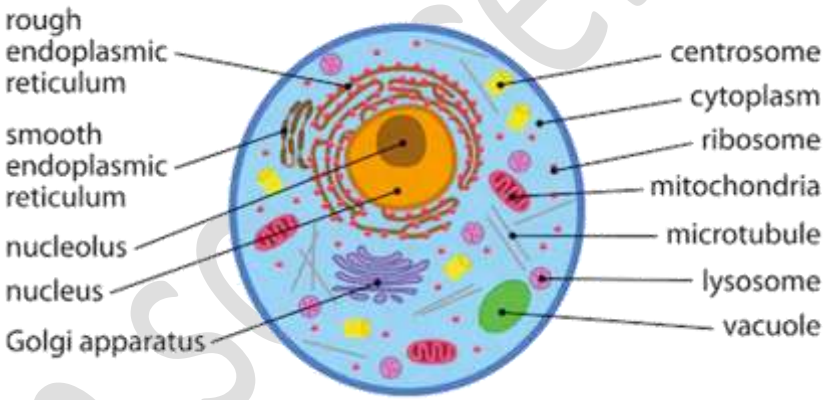


Key words

1. **CELL:** The basic structural and functional unit of all living organisms.

2. **CELL MEMBRANE:** A thin, semi-permeable barrier that surrounds the cell, controlling the movement of substances in and out of the cell.

3. **CELL WALL:** A rigid outer layer found in plant cells, fungi, and some bacteria, providing structural support and protection.



4. **CYTOPLASM:** The jelly-like substance inside the cell where organelles are suspended and many cellular processes occur.

5. **CHLOROPLAST:** An organelle found in plant cells responsible for photosynthesis, containing chlorophyll and converting sunlight into energy-rich molecules.

6. **CHROMOSOME:** Thread-like structures made of DNA and proteins, carrying genetic information and passed from parent to offspring during cell division.

7. **EUKARYOTES:** Organisms whose cells have a true nucleus and membrane-bound organelles, including animals, plants, fungi, and protists.

8. **GENE:** A segment of DNA that contains the instructions for the synthesis of a specific protein or RNA molecule.

9. **MULTICELLULAR:** Organisms composed of multiple cells that work together to form tissues, organs, and organ systems.

10. **NUCLEAR MEMBRANE:** A double membrane that surrounds and protects the nucleus of a eukaryotic cell, controlling the movement of substances in and out.

11. **NUCLEOLUS:** A distinct region within the nucleus where ribosomes are synthesized and assembled.

12. **NUCLEUS:** The central organelle in eukaryotic cells, housing the genetic material (DNA) and controlling cellular activities.

13. **ORGAN:** A structure composed of different tissues working together to perform specific functions in an organism.

14. **ORGANELLES:** Specialized structures within a cell that carry out specific functions, such as mitochondria, endoplasmic reticulum, and Golgi apparatus.

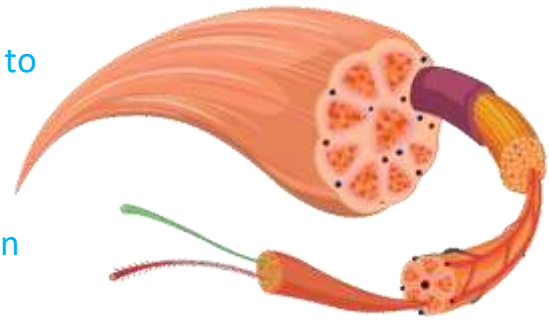
15. **PLASMA MEMBRANE:** Another term for the cell membrane, serving as a boundary between the cell and its external environment.

16. **PLASTID:** A type of organelle found in plant cells, involved in functions such as storage, pigmentation, and photosynthesis.

17. **PROKARYOTES:** Single-celled organisms that lack a true nucleus and membrane-bound organelles, including bacteria and archaea.

18. **PSEUDOPODIA:** Temporary projections of the cell membrane in some cells, such as amoebas, used for movement and capturing food.

19. **TISSUE:** A group of similar cells working together to perform a specific function within an organism.



20. **UNICELLULAR:** Organisms consisting of a single cell, carrying out all necessary life functions within that one cell.

21. **VACUOLE:** A membrane-bound organelle found in cells, often larger in plant cells, involved in storage, waste management, and maintaining cell shape.

22. **WHITE BLOOD CELL (WBC):** A type of blood cell that plays a crucial role in the immune system's defence against pathogens and foreign substances.