Chapter 5

The Fundamental Unit of Life

Book - Science Textbook for class IX (NCERT)

Questions (Pg. No. - 59)

Q.1. Who discovered cells, and how?

Ans Robert Hooke discovered cells. While examining a thin slice of cork through a self-designed microscope, he observed box-like compartments resembling a honeycomb. Robert Hooke called these boxes cells.

Q.2. Why is the cell called the structural and functional unit of life?

Ans Cell is called the structural and functional unit of life because-

i) All organisms are made of cells. Organisms are made up of one or more cells.

ii) Each living cell has the capacity to perform certain basic functions that are characteristic of all living forms.

Questions (Page No. 61)

Q.1. How do substances like CO_2 and water move in and out of the cell? Discuss.

Ans CO_2 can move across the cell membrane by a process called diffusion. When, for example, CO_2 (carbon dioxide) ~~accumulates~~

(Which is cellular waste and requires to be removed out by the cell) accumulates in high concentrations inside the cell and in the cell's external environment the concentration of CO_2 is comparatively low CO_2 moves out of the cell, from a region of high concentration to a region of low concentration outside the cell by the process of diffusion.

Water moves in and out of the cell by osmosis. Osmosis is the passage of water from a region of high water concentration through a selectively permeable membrane to a region of low water concentration.

Q-2. Why is the plasma membrane called a selectively permeable membrane?

Ans Plasma membrane is called a selectively permeable membrane because it allows the entry and exit of some materials in and out of the cell and also prevents movement of some other materials.

Question (Page No. 63)

Q.1. Fill in the gaps in the following table illustrating differences between prokaryotic and eukaryotic cells.

Prokaryotic Cell	Eukaryotic cell
1. Size: generally small	1. Size: generally large
2. Nuclear region: undefined, absence of a nuclear membrane and known as nucleoid.	2. Nuclear region: well defined and surrounded by a nuclear membrane.
3. Chromosome: Single	3. More than one chromosome.
4. Membrane-bound cell organelles absent.	4. Membrane bound cell organelles present.

Questions (Page No. 65)

1. Can you name the two organelles we have studied that contain their own genetic material?

Ans 1) Mitochondria
2) Plastids

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2. If the organisation of a cell is destroyed due to some physical or chemical influence, what will happen?

Ans The cell has a basic structural organisation which helps the cells to perform functions like respiration, obtaining nutrition, clearing of waste materials etc. If the organisation of a cell is destroyed due to some physical or chemical influence, the cell will not be able to perform these basic functions.

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3. Why are lysosomes known as suicide bags?

Ans During the disturbance in cellular metabolism, for example, when the cell gets damaged, lysosomes may burst and the enzymes digest their own cell. Therefore lysosomes are known as suicide bags of a cell.

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4. Where are proteins synthesised inside the cell?

Ans Ribosomes are the sites of protein synthesis inside the cell.

Exercises (Page No. 67)

1. Make a comparison and write down ways in which plant cells are different from animal cells.

Ans Plant cells are different from animal cells in following ways :-

	Plant cell	Animal cell
1.	In plant cell, a cell wall lies outside the cell membrane.	Cell wall is absent in animal cell.
2.	In plant cells, plastids are present.	Plastids are absent in animal cells.
3.	Plant cells have very large vacuoles.	Vacuoles are small sized in animal cells.

3. What would happen if the plasma membrane ruptures or breaks down?

Ans Plasma membrane separates the contents of the cell from its external environment. It regulates the movement of materials between the interior of the cell and the outer environment. If the plasma membrane ruptures or breaks down the movement of materials in and out of the cell will not be regulated and such a cell will not be able to function.

4. What would happen to the life of a cell if there was no Golgi apparatus?

Ans Golgi apparatus function in storage, modification and packaging of substances manufactured in the cell. ~~It is also involved~~
It is also involved in the formation of lysosomes.

So, If there was no Golgi apparatus these activities would not take place in the cell ~~and~~. This would also affect the functioning of other organelles and ability of the cell to function.

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5. Which organelle is known as the ~~power house~~ powerhouse of the cell? Why?

Ans Mitochondria is known as the powerhouse of the cell because the energy required for various chemical activities needed for life is released by mitochondria in the form of ATP (Adenosine triphosphate) molecules.

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6. Where do the lipids and proteins constituting the cell membrane get synthesised?

Ans Smooth endoplasmic reticulum synthesises lipids and proteins get synthesised on ribosomes.

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7. How does an Amoeba obtain its food?

Ans Amoeba obtain its food through ~~the~~ process of endocytosis by ~~forming~~ extending pseudopodia which encircles and engulf the food. A membrane bound vesicle enclosing the food particle then detaches from the plasma membrane into the cytoplasm A food vacuole is then formed where food is digested.

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8. What is osmosis?

Ans Osmosis is the passage of water from a region of high water concentration through a selectively permeable membrane to a region of low water concentration.

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10. Which type of cell division is required for growth and repair of body and which type is involved in formation of gametes?

Ans The type of cell division required for growth and repair of body – Mitosis
The type of cell division involved in formation of gametes – Meiosis.
