

Science

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(Chapter – 5) (The Fundamental Unit of Life)

(Class – IX)

Exercises

Question 1:

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

Answer 1:

The cells of animals and plants have the following differences:

Animal Cell	Plant Cell
1. Animal cells are generally small in size.	1. Plant cells are larger than animal cells.
2. Cell wall is absent.	2. The plasma membrane of plant cells is surrounded by a rigid cell wall of <i>cellulose</i> .
3. Except the protozoan <i>Euglena</i> , no animal cell possesses plastids.	3. Plastids are present.
4. Vacuoles in animal cells are many, small and temporary.	4. Most mature plant cells have a permanent and large central sap vacuole.
5. Animal cells have a single highly complex and prominent Golgi apparatus.	5. Plant cells have many simpler units of Golgi apparatus, called dictyosomes.
6. Animal cells have <i>centrosome</i> and <i>centrioles</i> .	6. Plant cells lack <i>centrosome</i> and <i>centrioles</i> .

Question 2:

How is a prokaryotic cell different from a eukaryotic cell?

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Answer 2:

Difference between prokaryotic cell and eukaryotic cell:

Prokaryotic Cell	Eukaryotic Cell
1. Cell size is generally small (1 - 10 μm).	1. Cell is generally large (5 - 100 μm).
2. Nuclear region is called nucleoid and is not surrounded by a nuclear membrane.	2. Nuclear material is surrounded by a nuclear membrane.
3. Only a single chromosome is present.	3. More than one chromosome is present.
4. Nucleolus is absent.	4. Nucleolus is present.
5. Membrane bound cell organelles are absent.	5. Membrane bound cell organelles.
6. Cell division by fission or budding (no mitosis).	6. Cell division mitotic or meiotic.

Question 3:

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

Answer 3:

Plasma membrane is a selectively permeable membrane of the cell that maintains its homeostasis, i.e., constant internal composition of the cell. If it ruptures or breaks down the constant internal chemical composition of the cell will be lost and it will not be able to perform its basic functions. Such a cell with ruptured plasma membrane is killed.

Question 4:

What would happen to the life of a cell if there is no Golgi apparatus?

Answer 4:

The materials synthesized in the ER are stored, sorted, modified, packaged and dispatched to various targets inside and outside the cell through the Golgi apparatus packs products in vesicles, the secretory vesicles. In some cases complex sugars e.g. cellulose, may be made from simple sugars in Golgi apparatus. The Golgi apparatus is also involved in the formation of the cells which will not be possible if Golgi apparatus is not there.

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Question 5:

Which organelle is known as the powerhouse of the cell? Why?

Answer 5:

Mitochondria are known as the powerhouse of the cell because they contain enzymes that are needed for stepwise oxidation of food stuffs (carbohydrate, fats and lipids) present in the cells to CO₂ and water. Oxidation of food releases energy which is used to form high-energy ATP (*adenosine triphosphate*) molecules. ATP is known as Energy Currency of the cell and it is used as cellular fuel. Energy stored in ATP is used to bring about energy requiring activities of the cell such as photosynthesis, protein synthesis and muscle contraction.

Question 6:

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

Answer 6:

Rough Endoplasmic Reticulum (RER) - synthesizes proteins constituting cell membrane.

Smooth Endoplasmic Reticulum (SER) - synthesizes lipids constituting cell membrane.



Question 7:

How does *Amoeba* obtain its food?

Answer 7:

Amoeba has flexible cell membrane. It enables amoeba to engulf in food by the process called *endocytosis*.

Question 8:

What is osmosis?

Answer 8:

The diffusion of water or solvent through a semi-permeable membrane from a solution of lower concentration of solutes to a solution of higher concentration of solutes, to which the membrane is relatively impermeable, is called osmosis.

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