

# Cell Its Structure And Functions

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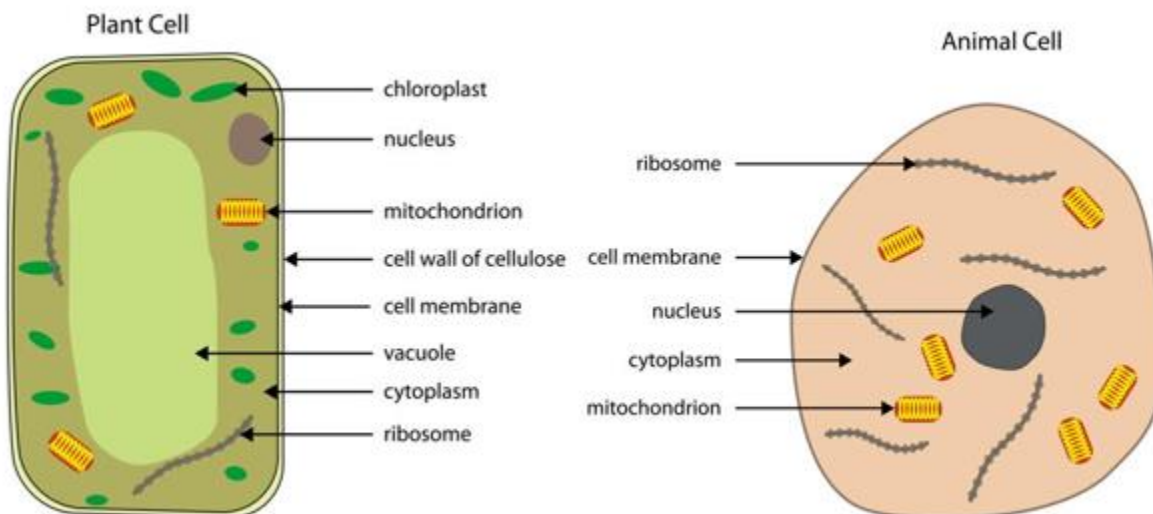
## Improve your learning

Q. 1. A. Differentiate between (A.S 1)

Plant cell and animal cell

Answer :

Plant cell	Animal cell
Plants cells are larger as compared to animal cells.	Animal cells are smaller as compared to plant cells.
The cell wall is present outside the plasma membrane in plant cells	The cell wall is absent in animal cells.
Plastids (chloroplast) is present in plant cells.	Plastids are absent in animal cells.
Centrosome are absent in plant cells	Centrosome are present in animal cells
Vacuoles are large in plant cells	Vacuoles are small or absent in animal cells



Q. 1. B. Differentiate between (A.S 1)

Prokaryotic and eukaryotic cells

**Answer :**

<b>Prokaryotic cells</b>	<b>Eukaryotic cells</b>
Are always unicellular such as bacteria	May be unicellular or multicellular
No definite nucleus because the nuclear membrane is absent	The definite nucleus is present with the nuclear membrane
Membrane-bound organelles, such as mitochondria are absent	Membrane-bound organelles, such as mitochondria are present
DNA is circular, without proteins	DNA is linear and associated with histone proteins to form chromatin (a thread like a network in the nucleus)
Ribosomes are small (70S)	Ribosomes are small (the 80S)
Reproduction by asexual methods only	Reproduction is asexual or sexual

**Q. 2. What happens if plasma membrane ruptures or breaks? (AS 2)**

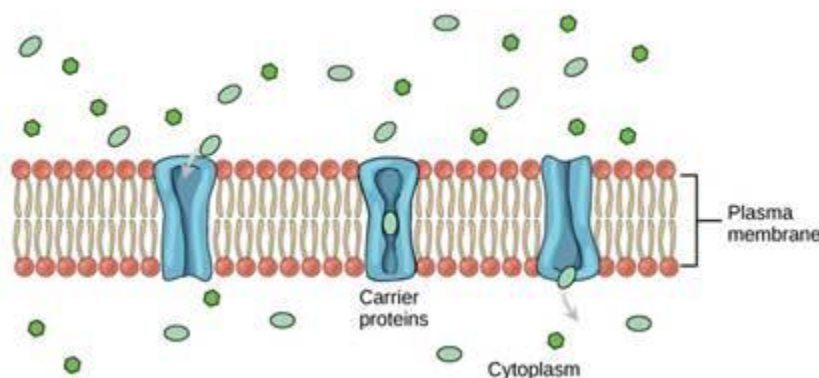
**Answer :** i. The plasma membrane is made of lipid +protein.

ii. It is the living boundary of all the animal cells.

iii. Through plasma, membrane molecules pass into the cells.

iv. If it ruptures or breakdown then the cell will not be able to exchange material from surrounding by diffusion or osmosis.

v. As a result, the protoplasmic material will be disappeared and the cell will die.

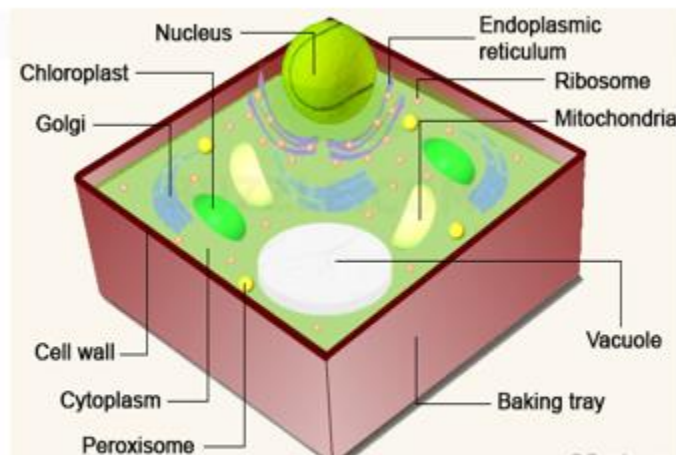


**Q. 3. Prepare a model of a plant cell or animal cell. (AS 5)**

**Answer :** Making a model of a plant cell:

i. Take a shoebox, paint it to inside and outside the boundary. This is the cell wall.

- ii. Inside the box put yellow or clear cellophane which will represent the cytoplasm in which the organelles are present.
- iii. Take a small sized tennis ball and put it as shown in the diagram.
- iv. The ball is the nucleus. Glue the nucleus to the bottom of the box.
- v. Take some soft clay and make cell organelles such as mitochondria, chloroplast, and vacuoles with different colours and glue them as shown.



A model of a plant cell

**Q. 4. What would happen to the life of cell if there was no Golgi complex? (AS 2)**

**Answer :** i. The Golgi complex or Golgi apparatus is a cell organelle which contains vesicles.

ii. The Golgi apparatus packages proteins in the vesicles inside of the cell before sending them to where they needed.

iii. If the Golgi complex is not present the packaging and transport of protein would not happen in the cells.

iv. For example, a specific type of liver cell called a hepatocyte produces a protein in blood plasma called albumin. The albumin is made almost exclusively within the liver.

v. The Golgi bodies in hepatocytes transport the albumin out of the liver to become part of the plasma portion of blood.

vi. Hence, in the absence of Golgi complex in hepatocytes albumin will not be formed.

**Q. 5. What happens to a cell if the nucleus is removed? Give reasons to support your answer? (AS 1)**

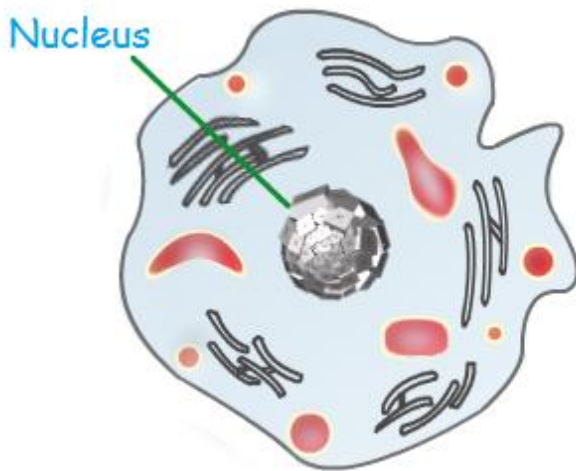
**Answer :** i. The nucleus is the driver or brain of the cell.

ii. It controls all the activities of the cell.

iii. If the nucleus of a cell is removed then the cell will not function. The cell will be just like a car without a driver.

iv. Any of the cell function will not be carried out in absence of its brain or driver.

v. Ultimately cell will die.



**Q. 6. Are lysosomes known as suicidal bags of the cell? Why? (AS 1)**

**Answer :** i. Lysosomes are very small cell organelles present in the cytoplasm.

ii. Lysosomes contain destructive enzymes are also called hydrolytic enzymes.

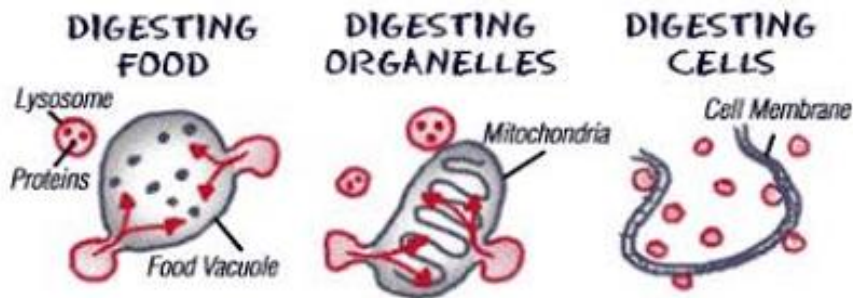
iii. These enzymes can digest or destroy every part of the cell.

iv. Thus, the enzymes normally do not come in contact with the rest of the cell.

v. The materials that need to be destroyed are transported to the lysosomes.

vi. If the enzymes are released from the lysosomes which can digest entire cell.

vii. Therefore, lysosomes are also known as the suicide bags of the cell.



Lysosomes as suicidal bag

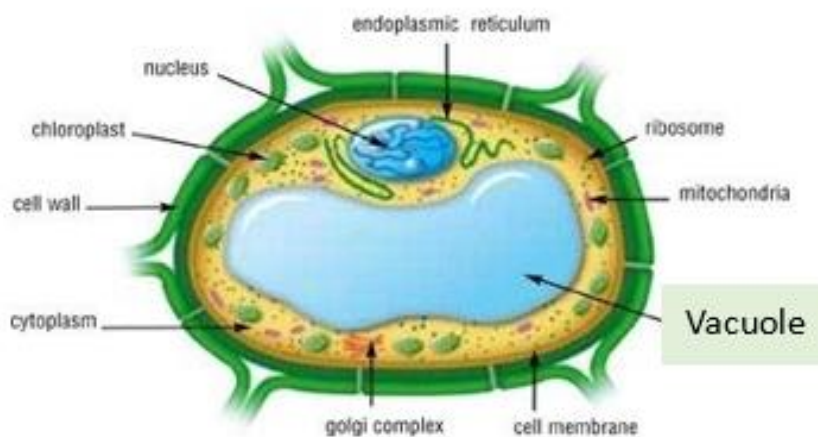
**Q. 7. Why does plant cell possess largely sized vacuole? (AS1)**

**Answer : i. In plant cell vacuoles function is to store nutrients, water, and wastes as in animal cells.**

**ii. But in plant cell vacuoles are larger because they provide stiffness along with the plant's cell wall.**

iii. Over a period of time the waste products accumulated will break down in the vacuole.

iv. Vacuoles maintain the shape of the cell constantly without getting disturbed by the availability of the water to the plant. Hence, plants have larger vacuoles.



A plant cell with large vacuole

**Q. 8. Prepare a temporary mount of any leaf peel to observe the stomata draw their picture? Write a short note on the same. (AS 5)**

**Answer :** To prepare a temporary mount of leaf peel to show its stomata. For this you need leaf of a plant, forceps, watch glass, slide, coverslip, brush, needles, safranin, glycerin, and microscope.

**Procedure:**

- i. Peel off the leaf from it's under surface and put the peel in a watch glass containing water.
- ii. Add a few drops of saffron stain into the watch glass to stain the peel.
- iii. Take out the stained peel on the cleaned slide.
- iv. Remove the excess stain from the slide.
- v. Put a drop of glycerin on the slide over the peeled cover it gently with coverslip without air bubbles.
- vi. Observe the slide under the microscope.

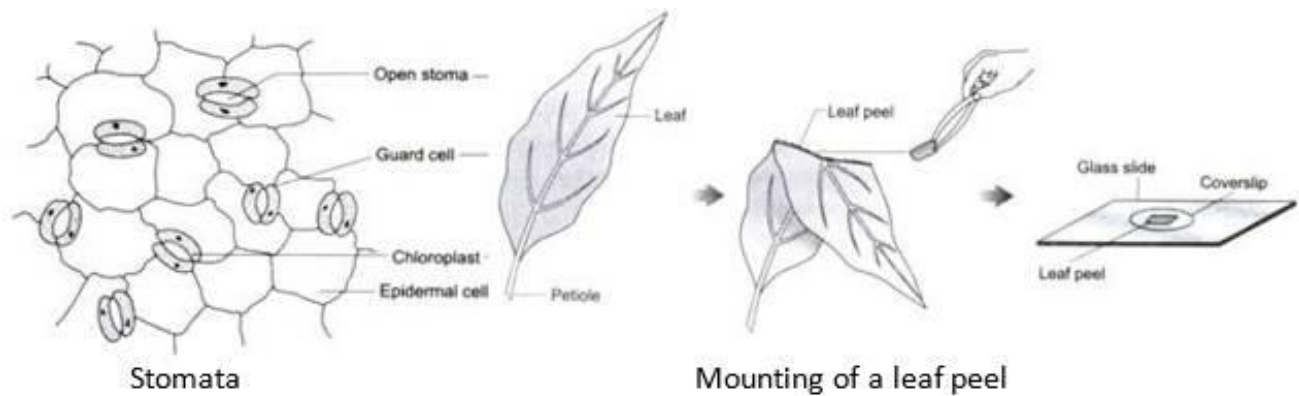
**Observations:**

- i. The epidermis is seen in the mount. It appears as a single layer of cells without intracellular spaces.
- ii. Minute pores (openings) are seen embedded in between epidermal cells.

**Inference:**

- i. The minute pores seen in the temporary mount are stomata.
- ii. Each stoma is surrounded by two bean-shaped cells called guard cells.

Stomata are minute apertures (openings) present on the surface of the leaf. Stomata are generally more on the lower epidermis. Each stoma is surrounded by two bean-shaped cells called guard cells. The inner wall facing pore is thicker than the outer wall. The turgidity of guard cells controls the opening and closing of stomata. Stomata help in exchange of gases and water vapours between the atmosphere-land leaf.



**Q. 9. “Cell is the basic unit of life”, explain the statement. (AS 1)**

**Answer :** i. The cell is the basic units of life’. This statement is correct because a cell is capable of doing all the life processes such as movement, sensitivity (senses), growth, reproduction, excretion and nutrition which are needed to survive. For example, *Amoeba* is made of only one cell and it performs all the life processes in one cell.

ii. Similarly, all multicellular organisms do all the life processes through their cells.

iii. Hence, the cell is the basic units of life.

**Q. 10. How do you appreciate about the organization of cell in the living body? (AS 6)**

**Answer :** i. Let’s understand the meaning of ‘appreciation’. Appreciation means is the knowing or understanding the value of something.

ii. When you praise some thing or someone is called appreciation.

iii. In this question, you have to appreciate the organization of cell in the living body.

iv. All living organisms are made up of cells and cell is a structural and functional unit of life.

v. In organisms made of one cell, all the life processes are carried out in one cell.

vi. In multicellular organisms, each cell does not perform the same function.

vii. Cells in these organisms organized to form tissue.

viii. A tissue is a group of cells which are similar in structure and a specific function.

ix. Many tissues combine to form an organ, which performs a particular function.

- x. Group of organs works together to perform life activities.
- xi. Let's understand with an example: stomach, liver pancreas, intestine are the organs of digestive system work together to digest food.
- xii. Several organ systems together to form a multicellular organism.
- xiii. The different organ systems work together to keep the organism alive.
- xiv. Therefore, an organization of cell in the living body is highly appreciable.

**Q. 11. If the organization of cell is destroyed due to physical and chemical influence what will happen? (AS 6)**







**Answer :** If the organization of a cell is destroyed due to some physical or chemical influence, the cell will disintegrate and will not be able to perform the basic functions.

- i. The hydrolytic enzyme from the lysosomes may digest the cell content and ultimately cell will die.

**Q. 12. Read the chapter carefully collect the information about the functions of different cell organelles and make a table which contains a serial number. Cell organelle, function. Don't forget to write your specific findings below the table? (AS 4)**

**Answer :**



Sl. No.	Organelles	Function	Image
1	Nucleus	The nucleus is the 'brain' or driver of the cell. It controls the activities of the cell.	 Nucleus
2	Mitochondria	It produces energy. It is called 'power house' of the cell.	 Mitochondria
3	Golgi complex	It sorts, packages and transport of proteins.	 Golgi Apparatus
4	Endoplasmic reticulum	It synthesizes and processing of proteins	
5	Lysosome	It contains digestive enzymes.	 Lysosomes
6	Ribosomes	Involves in protein synthesis	 Ribosomes

Findings:

Some cell organelles such as the nucleus, mitochondria, Golgi complex, endoplasmic reticulum, ribosomes etc., are present in both plant and animal cells. Some cell organelles such as the chloroplast, vacuole and cell wall present only in a plant cell. The centrosome is only found in the animal cell.

**Q. 13. How could you appreciate the function of tiny cell in a large body of an organism? (AS 6)**

**Answer :** i. Let's understand the meaning of 'appreciation'. Appreciation means is the knowing or understanding the value of something.

ii. When you praise some thing or someone is called appreciation.

iii. The body of multicellular organisms can be compared with a building. The building is made of bricks.

iv. Each brick is very small but it is the structural unit of the building.

v. Similarly living organisms made of the cell, which is the structural and functional unit of an organism.

vi. In unicellular organisms, all functions of an organism are performed by a single cell.

vii. But in multicellular organisms, cells perform the specific function by organizing themselves into tissues, organs, organ system and then into organisms.

viii. Therefore, the function of an organism is the outcome of the function of cells.

**Q. 14. Look at the following cartoon of a cell. Find out the functions of cell organelles (AS 5)**



**Answer :** i. The most important organelle in the cell is nucleus.

ii. It is surrounded by two membranes. Membrane has many opening called nuclear pore.

iii. Nucleus is the control center of the cell. The nucleus also contains genetic material or DNA (Deoxyribonucleic acid). DNA stores all the genetic information needs for making proteins and many other important molecules.

iv. Through nuclear pore, transport of materials into and out of the nucleus. Within the nucleus of a cell a round structure called the nucleolus.

- v. Outside of the nucleus but within the cell membrane is a gel-like substance called cytoplasm is present. In the cytoplasm other cell organelles are present.
- vi. Making proteins is a very essential function of a cell.
- vii. Ribosomes are small cell organelles which synthesize protein.
- viii. Once proteins are made, they need to be moved to different parts of the cell.
- ix. The endoplasmic reticulum (E.R.) is a collection of lipid membranes that work to move the proteins from one area of the cell to another.
- x. The E.R. transports these proteins to another organelle that will package them up and ship them out.
- xi. The smooth E.R. does not have any ribosomes on its surface.
- xii. This is where the lipid part of the cell membrane is assembled. The newly formed protein is need to be packaged in such a way that they can leave the cell and be taken in by the parts of the body that need them.
- xiii. The organelle responsible for this is called the Golgi complex or Golgi bodies.
- xiv. The Golgi complex changes, sorts and packages the proteins as they leave the E.R. so they are ready to leave the cell. Because it is so important to shipping things out of the cell, the Golgi apparatus is always found near the cell membrane.

**Q. 15. Who and when proposed cell theory. What are salient features of it? (AS 1)**

**Answer :** i. In 1838, *Matthias Schleiden*, a German botanist, examined that plants are made up of cells.

ii. Theodore Schwann (1839), a British Zoologist, examined that animals are also made up of cells.

iii. Later on, Rudolf Virchow (1855) explains that cells arise from pre-existing cell through the process of division. He modified the hypothesis of Schleiden and Schwann to give the cell theory a final shape.

iv. Cell theory as understood today is based on two basic features:

(i) All living organisms are composed of cells and product of cell.

(ii) All cells arise from pre-existing cells.