

# BIOLOGY

## Chapter 5: The Fundamental Unit of Life



## Important Question

### ➤ Multiple Choice Questions:

1. The basic unit of life is:

- (a) tissue
- (b) cell
- (c) both
- (d) none of them

2. Who discovered the cell?

- (a) Robert Hooke
- (b) Leeuwenhoek
- (c) Robert Brown
- (d) T. Schwann

3. The cell wall of a plant cell is made up of:

- (a) glucose
- (b) fructose
- (c) protein
- (d) cellulose

4. Which of the following controls all biological activities of a cell?

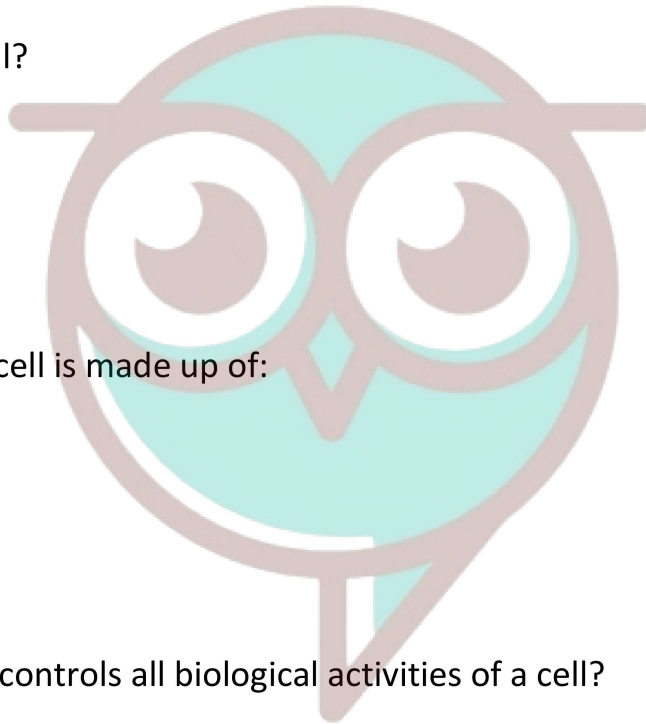
- (a) Protoplasm
- (b) Cell wall
- (c) Nucleus
- (d) All of these

5. Which of the following is known as the 'Power House' of a cell?

- (a) Nucleus
- (b) Golgi Bodies
- (c) Ribosome
- (d) Mitochondria

6. Digestive Enzymes are found in:

- (a) Protoplasm
- (b) Cell wall
- (c) Lysosomes



*Swotters*

(d) Mitochondria

7. Which is the longest cell of the human body?

(a) Nerve cell

(b) Liver cell

(c) Kidney cell

(d) Cardiac cell

8. Which of the following cell organelles functions both as an intracellular transport system and as a manufacturing surface?

(a) Nucleus

(b) Mitochondria

(c) ER

(d) None of these

9. Which of the following cell organelles help in the storage, modification, and packaging of substances manufactured in the cell?

(a) Golgi apparatus

(b) Nucleus

(c) Mitochondria

(d) Chloroplasts

10. Who proposed the "Black Reaction"?

(a) Benda

(b) Camillo Golgi

(c) Schleiden

(d) None of them

11. Who discovered the nucleus in the cell?

(a) Leeuwenhoek

(b) Robert Brown

(c) Schleiden

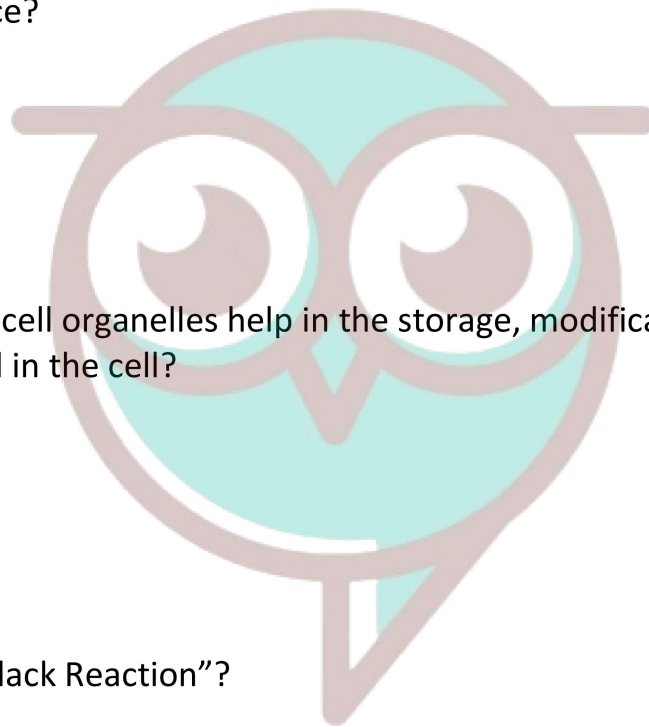
(d) Robert Hooke

12. Which of the following are formed in bone marrow?

(a) RBC

(b) Cartilage cell

(c) Blood platelets



Swotters

(d) Fibres

13. Which of the following can be made into crystal?

(a) A bacterium

(b) An amoeba

(c) A virus

(d) A sperm

14. Chromosomes are made up of:

(a) DNA

(b) Protein

(c) DNA and protein

(d) RNA

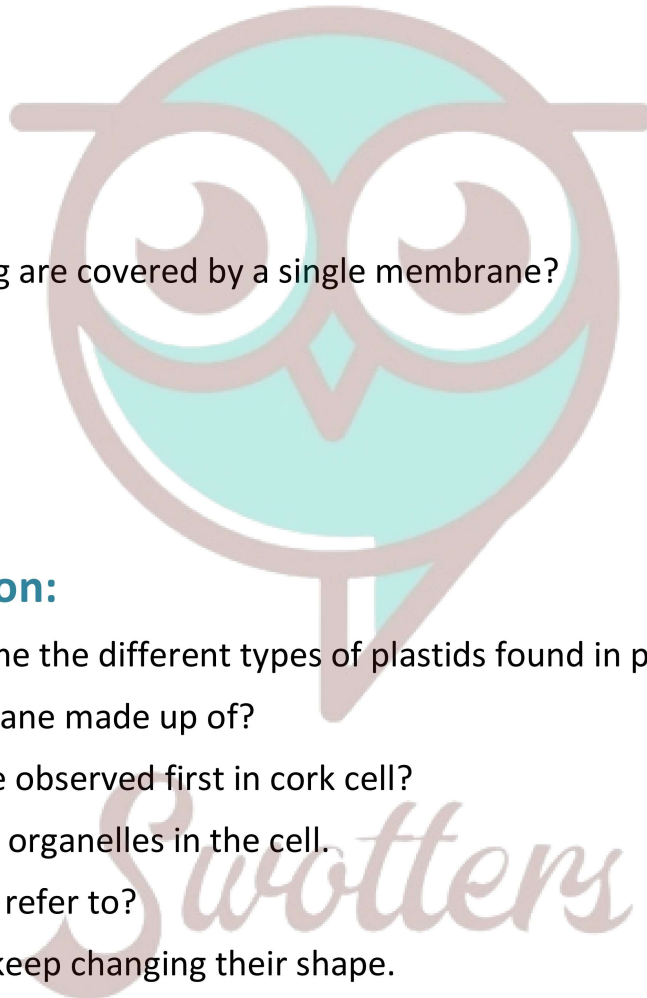
15. Which of the following are covered by a single membrane?

(a) Mitochondria

(b) Vacuole

(c) Ribosome

(d) Plastid



➤ **Very Short Question:**

1. What are plastids? Name the different types of plastids found in plant cell.

2. What is plasma membrane made up of?

3. What did Robert Hooke observed first in cork cell?

4. Name the autonomous organelles in the cell.

5. What does protoplasm refer to?

6. Name two cells which keep changing their shape.

7. Name the smallest cell and the longest cell in human body.

8. Name 3 features seen/ present in almost every cell.

9. What is diffusion?

10. What is osmosis? This takes place from high water concentration to low water concentration.

➤ **Short Questions:**

1. State two conditions required for osmosis.

2. What is plasmolysis?

3. How do fungi and bacteria withstand much greater changes in the surrounding medium than animal cells?
4. Give the function of nuclear membrane.
5. Name the cell-organelles that have their own DNA and ribosomes.
6. State the difference between smooth endoplasmic reticulum and rough endoplasmic reticulum.
7. What is endocytosis?
8. What is the function of vacuoles?

### ➤ Long Questions:

1. Give five points of differences between plant cell and animal cell.
2. Give five points of differences between prokaryotic cell and eukaryotic cell.
3. Draw a neat labelled diagram of plant cell and label its parts.
4. Draw a neat labelled diagram of animal cell.

### ➤ Assertion Reason Questions:

1. For two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:
  - a. Both Assertion and Reason are correct, and reason is the correct explanation for assertion.
  - b. Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.
  - c. Assertion is true but Reason is false.
  - d. Both Assertion and Reason are false.

**Assertion:** All plants and animals are composed of cells.

**Reason:** Plants and animals made up of DNA.

2. For two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:
  - a. Both Assertion and Reason are correct, and reason is the correct explanation for assertion.
  - b. Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.
  - c. Assertion is true but Reason is false.

d. Both Assertion and Reason are false.

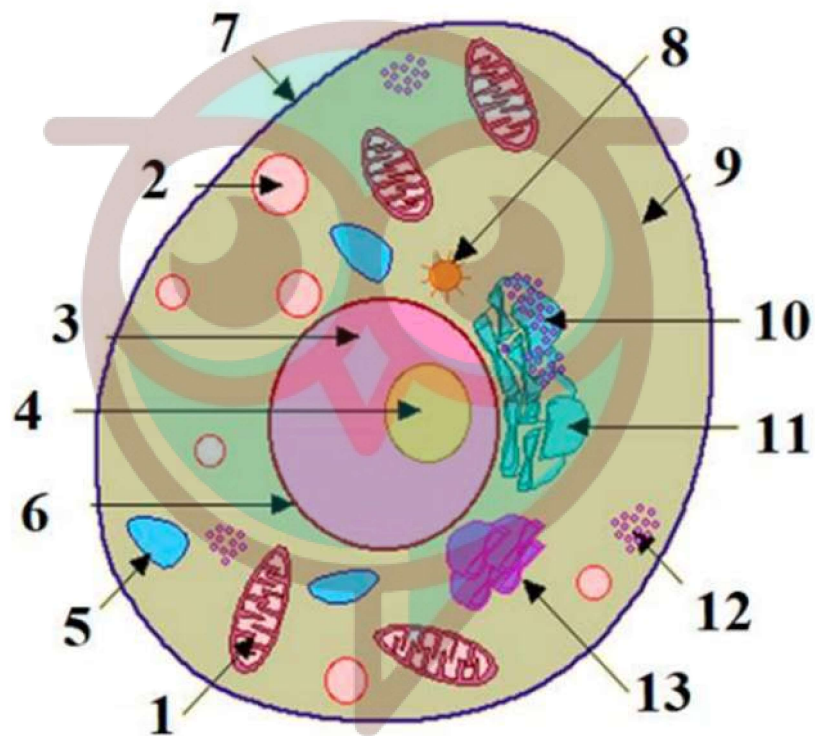
**Assertion:** All plants and animals are composed of cells.

**Reason:** All plants and animals are composed of cells.

➤ **Case Study Question:**

1. Read the following and answer any four questions from (i) to (v)

Study the given diagram and answer the following questions.



(i) Identify the given diagram.

- (a) Structure of animal cell
- (b) Structure of plant cell
- (c) Bacterial cell
- (d) Prokaryotic cell

(ii) The function of part labelled as 1 is

- (a) Release of energy
- (b) Protein synthesis
- (c) Transmission of heredity characters
- (d) Storage

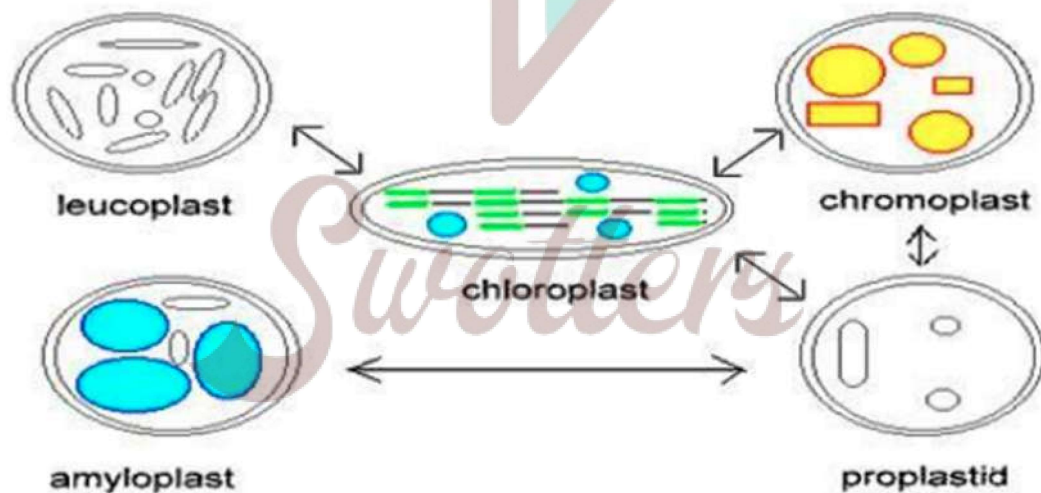
(iii) Mention any two structures which are not found in above cell.

- (a) Cell wall and ribosomes

- (b) Cell wall and golgi apparatus
- (c) Cell membrane and Golgi apparatus
- (d) Plastids and cell wall
- (iv) Chromosomes are present in
  - (a) Cell membrane
  - (b) Golgi apparatus
  - (c) Endoplasmic reticulum
  - (d) Nucleus
- (v) Lysosomes are also called
  - (a) suicide bags
  - (b) digestive bags
  - (c) demolition squads
  - (d) all the above

2. Read the following and answer any four questions from (i) to (v)

Leucoplasts are colourless plastids. They store starch, oil, proteins. Chromoplasts are coloured plastids. They contain pigments. e.g. Chloroplasts contain green pigment present in the plant cell. Chromoplasts provide colour to various flowers and fruits.



- (i) What is the function of leucoplasts?
  - (a) They store starch, oil, proteins.
  - (b) They provide colour various flowers and fruits.
  - (c) They help in photosynthesis.
  - (d) They give support to the plants.
- (ii) Which plastids provide colour to fruits and flowers?

- (a) Leucoplasts
- (b) Chromoplasts
- (c) Chloroplasts
- (d) Proteinoplast

(iii) Which of the following statement is true?

- (a) Plastids are present in both plant and animal cell.
- (b) Plastids are absent in plant as well as animal cell.
- (c) Plastids are present only in plant cell.
- (d) Plastids are present only in animal cell.

(iv) Which plastids contain green pigment?

- (a) Leucoplasts contain green pigment.
- (b) Chloroplasts contain green pigment.
- (c) Chromoplasts mainly contain green pigment.
- (d) None of the plastids contain green pigment.

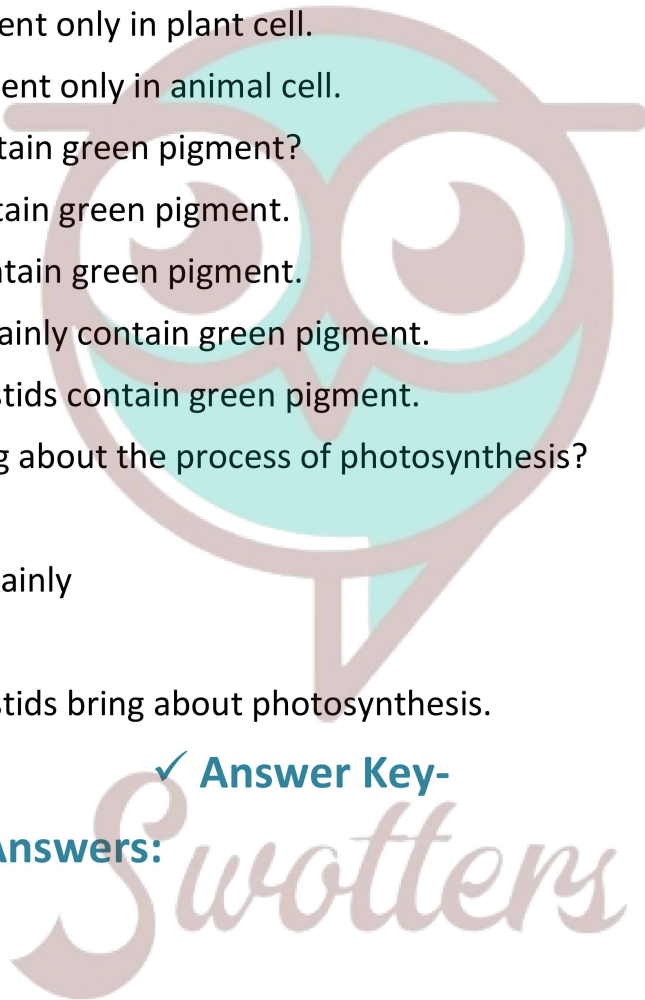
(v) Which plastids bring about the process of photosynthesis?

- (a) Leucoplasts
- (b) Chromoplasts mainly
- (c) Chloroplasts
- (d) None of the plastids bring about photosynthesis.

✓ **Answer Key-**

➤ **Multiple Choice Answers:**

1. (b) cell
2. (a) Robert Hooke
3. (d) cellulose
4. (c) Nucleus
5. (d) Mitochondria
6. (c) Lysosomes
7. (a) Nerve cell
8. (c) ER
9. (a) Golgi apparatus
10. (b) Camillo Golgi





11. (b) Robert Brown
12. (a) RBC
13. (c) A virus
14. (c) DNA and protein
15. (b) Vacuole

### ➤ Very Short Answers:

1. Answer: Plastids are organelles found only in plants. They are:
  - (a) Chloroplast-Containing chlorophyll
  - (b) Chromoplast-Containing carotenoids and xanthophyll (coloured plastids)
  - (c) Leucoplast-White or colourless plastids
2. Answer: Plasma membrane is made up of proteins and lipids.
3. Answer: Robert Hooke observed that cork consists of box like compartments which formed a honeycomb structure.
4. Answer. Chloroplasts and mitochondria are the autonomous organelles in the cells.
5. Answer: Protoplasm refer to cytoplasm and nucleus.
6. Answer: Amoeba and white blood cells.
7. Answer: The smallest cell is the red blood cell or sperm cell in male. Longest cell is the nerve cell.
8. Answer: Plasma membrane, nucleus and cytoplasm.
9. Answer: When gases like  $\text{CO}_2$ ,  $\text{O}_2$ , move across the cell membrane, this process is called diffusion.
10. Answer: The movement of water molecules through a selectively permeable membrane is called osmosis. This takes place from high water concentration to low water concentration.

### ➤ Short Answer:

1. Answer:
  - (i) The difference in the concentration of water, one should have higher concentration than the other.
  - (ii) Semi-permeable membrane is also required through which water will flow.
2. Answer: When a living plant cell loses water through osmosis there is shrinkage or contraction of the contents of the cell away from the cell wall. This phenomenon is known as plasmolysis.
3. Answer: The cell wall present in fungi and bacteria permits these cells to withstand very dilute external medium without bursting.

The cells take up water by osmosis, swells, and builds the pressure against the cell wall. The wall exerts an equal pressure against the swollen cell. It is because of the cell wall, such cells can withstand much greater changes in the surrounding medium than animal cells.

4. Answer: The nuclear membrane present as outer covering in the nucleus allows the transfer of material inside and out of the nucleus to cytoplasm.
5. Answer: The cell organelles with their own DNA and ribosomes are mitochondria and plastids.
6. Answer:

<b>Smooth Endoplasmic Reticulum</b>	<b>Rough Endoplasmic Reticulum</b>
<ol style="list-style-type: none"> <li>1. It looks smooth.</li> <li>2. SER helps in the manufacture of fat molecules or lipids.</li> </ol>	<ol style="list-style-type: none"> <li>1. It looks rough.</li> <li>2. Ribosomes are attached to RER which synthesise proteins.</li> </ol>

7. Answer: The cell membranes flexibility allows the cell engulf in food and other material from its external environment. This process is known as endocytosis. E.g., Amoeba acquires its food through such processes.
8. Answer: Vacuoles are storage sacs for solid or liquid content. In plant cells it provides turgidity and rigidity to the cell. In single-celled organisms vacuoles store food, e.g., Amoeba.

➤ **Long Answer:**

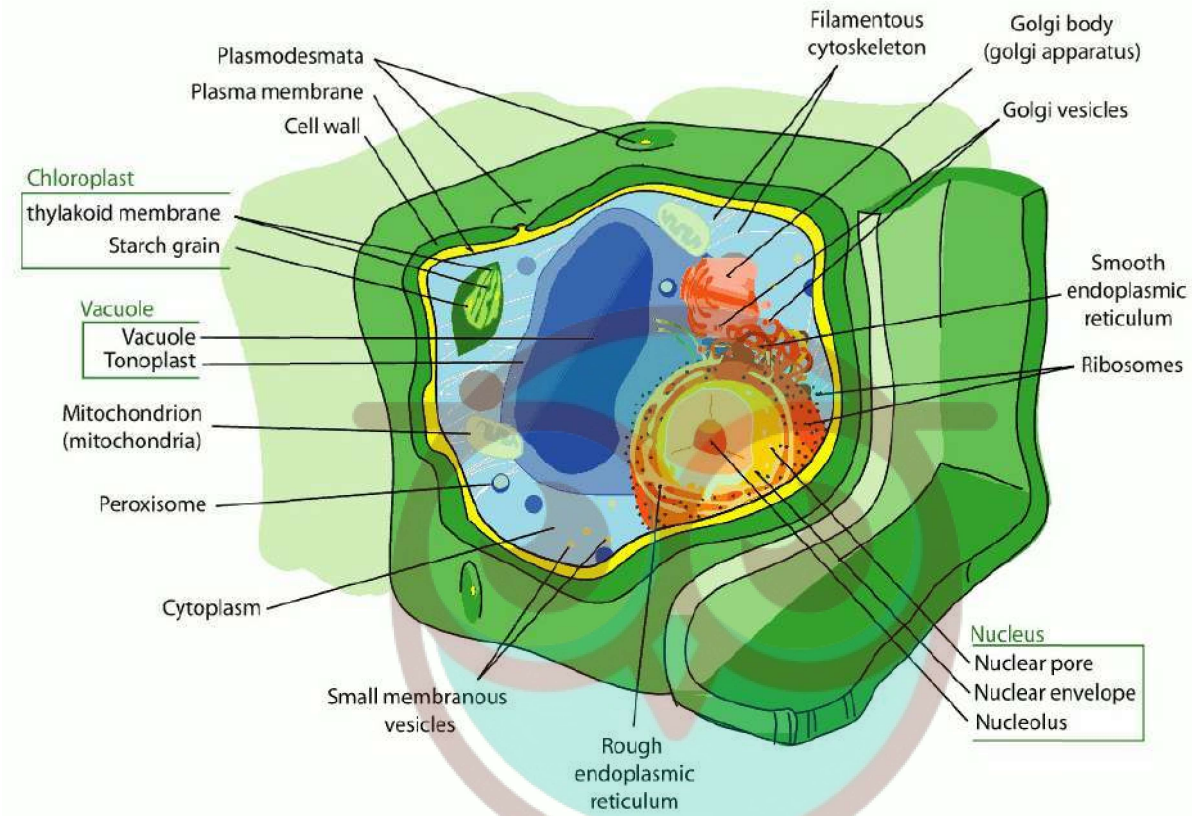
1. Answer:

<b>Plant Cell</b>	<b>Animal Cell</b>
<ol style="list-style-type: none"> <li>1. Size is usually larger than animal cell.</li> <li>2. Cell wall present.</li> <li>3. Plastids are present.</li> <li>4. Vacuoles are large in number and bigger in size.</li> <li>5. Centriole absent.</li> </ol>	<ol style="list-style-type: none"> <li>1. Size is usually smaller than plant cell.</li> <li>2. Cell wall absent.</li> <li>3. Plastids are absent.</li> <li>4. Vacuoles are small in size and less in number.</li> <li>5. Centriole present.</li> </ol>

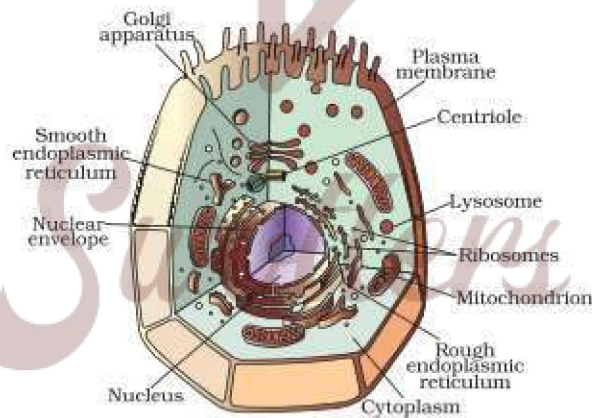
2. Answer:

<b>Characters</b>	<b>Prokaryotic Cell</b>	<b>Eukaryotic Cell</b>
1. <b>Size</b>	0.5–5 μm diameter.	Diameter 1 μm–40 μm.
2. <b>Nucleus</b>	No true nucleus, single chromosome, nuclear membrane absent.	True nucleus, nuclear membrane is present, more than one chromosome is present.
3. <b>Organelles</b>	Membrane-bound organelles are absent.	Membrane-bound organelles are present.
4. <b>Ribosomes</b>	Ribosomes are 70s and randomly scattered.	Ribosomes are 80s, can be free or attached to ER.
5. <b>Cell division</b>	Cell divides by simple fission.	Cell divides by mitosis or by meiosis.

3. Answer:



4. Answer:



➤ **Assertion Reason Answer:**

1. (b) Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.
2. (a) Both Assertion and Reason are correct, and reason is the correct explanation for assertion.

➤ **Case Study Answer:**

1. Answer:

(i) (a) Structure of animal cell

(ii) (a) Release of energy

Mitochondria are sites of cellular respiration. They use molecular oxygen from air to oxidise the carbohydrates and fats (lipids) present in the cell to carbon dioxide and water vapour. Oxidation releases energy, a portion of which is used to form ATP (adenosine triphosphate). Since the mitochondria synthesize, energy-rich compounds (ATP), they are known as 'power house' of the cell. The energy stored in ATP is used by the cell.

(iii) (d) Plastids and cell wall

(iv) (d) Nucleus

(v) (a) suicide bags

Lysosomes serve as intracellular digestive system, hence, called digestive bags. They destroy any foreign material which enter the cell such as bacteria and virus. In this way they protect the cells from bacterial infection.

Lysosomes also remove the worn out and poorly working cellular organelles by digesting them to make way for their new replacements. In this way, they remove the cell debris and are also known as demolition squads, scavengers and cellular housekeepers. Thus, lysosomes form a kind of garbage disposal system of the cell

## 2. Answer:

(i) (a) They store starch, oil, proteins.

(ii) (b) Chromoplasts

(iii) (c) Plastids are present only in plant cell.

(iv) (b) Chloroplasts contain green pigment.

(v) (c) Chloroplasts