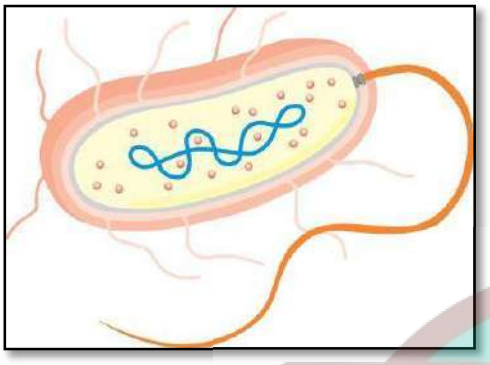
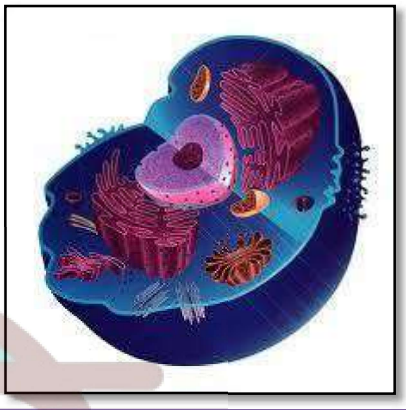
SCIENCE

Chapter 18: Cell – Structure and Functions

Prokaryotic and Eukaryotic Cells

PROKARYOTIC CELL	FEATURE	EUKARYOTIC CELL
		
Absence of well-defined nucleus	Nucleus	Presence of well-defined nucleus with a nuclear membrane
Absent	Nucleolus	Present
Presence of a single length of only DNA	Genetic material	Presence of several lengths of DNA wound around certain proteins
Presence of smaller ribosomes	Ribosomes	Presence of larger ribosomes
Absence of other cell organelles	Cell organelles	Presence of several other cell organelles such as mitochondria, ER, chloroplasts etc.
Cell division occurs by fission or budding but not by mitosis	Cell division	Cell division occurs by mitosis or meiosis
Bacteria, blue green algae	Examples	*Euglena*, *Amoeba*, plants, animals

Important Questions

Multiple Choice Questions-

Question 1. Largest cell visible to uniaded eye is:

(a) hen's egg

(b) ostrich egg

(c) bacteria cell

(d) nerve cell

Question 2. Which of the following is not a major component of protoplasm?

(a) hydorgen

(b) nitrogen

(c) Sulphur

(d) oxygen

Question 3. The organelle present oiily in plants is:

(a) mitochondria

(b) chromosomes

(c) nucleus

(d) plastids

Question 4. Which of the following is present only in plants:

(a) plasma membrane

(b) cell wall

(c) nucleo membrane

(d) cytoplasm

Question 5. Yolk is:

(a) small part of cell

(b) yellow part of egg

(c) white part of egg

(d) none of these

Question 6. The outermost layer of animal cell is:

(a) cell wall

(b) cell membrane

(c) nuclear membrane

(d) none of these

Question 7. The white part of egg is called:

(a) yolk

(b) albumen

(c) cytoplasm

(d) none of these

Question 8. The shape of amoeba is:

(a) round

(b) regular

(c) irregular

(d) none of these

Question 9. The basic structural unit of living organisms is:

(a) cell

(b) tissue

(c) organ

(d) none of these

Question 10. Is hen's egg a single cell:

(a) no

(b) yes

(c) can't say

(d) none of these

Very Short:

1. How many types of things are there on earth?
2. Name the structural unit of an organism.
3. What is cell?
4. What is cork?
5. Who discovered the cell and when?
6. What is basic structural unit of a building?
7. Is hen's egg a cell or group of cells?
8. Name a cell which can be seen by an unaided eye.
9. How do scientists observe and study the living cells?
10. How many cells are there in human body?

Short Questions :

1. If there is any difference between the vacuoles sizes in plant and animal. Explain.
2. Differentiate between unicellular and multicellular organisms.
3. Explain how Pseudopodia are helpful for Amoeba.
4. Name the part of cell which provides its shape.
5. Which component provides rigidity to plant cell?

6. Define Tissue.
7. Differentiate between Prokaryotes and Eukaryotes.
8. Relate Tissue to cell and organ.
9. Give example of some unicellular and multicellular organisms
10. Define the function of Plasma membrane.

Long Questions :

Question 1.

Differentiate between

(a) Cell wall and cell membrane

(b) Leucoplast and chloroplast

(c) Vacuole in a plant cell and an animal cell

(d) A tissue and an organ

Question 2.

What are the main functional regions of a cell? Explain.

Question3.

Define cell membrane and state its functions.

Question 4.

Define nucleus and state its major parts.

Answer

MCQ

1. Answer

(b) ostrich egg

Largest cell visible to unaided eye is ostrich egg.

2. Answer

(c) Sulphur

Sulphur is not a major component of protoplasm.

3. Answer

(d) plastids

The organelle present only in plants is plastids.

4. Answer

(b) cell wall

Cell wall is present only in plants. It is not present in animal cells.

5. Answer

(b) yellow part of egg

Yolk is yellow part of egg.

6. Answer

(b) cell membrane

Cell membrane is the outermost layer of animal cell.

7. Answer

(b) albumen

The white part of egg is called albumen.

8. Answer

(c) irregular

The shape of amoeba is irregular.

9. Answer

(a) cell

Cell is the basic structural unit of living organisms.

10. Answer

(b) yes

Yes, hen's egg is a single cell.

Very Short-

1. **Answer:** There are two types of things:
   (i) Living things
   (ii) Non-living things.
2. **Answer:** Cell.
3. **Answer:** The structural and functional unit of life is called cell.
4. **Answer:** Cork is the part of bark of a tree.
5. **Answer:** Robert Hooke discovered the cell in 1665.
6. **Answer:** Bricks.
7. **Answer:** Hen's egg is a cell.
8. **Answer:** Hen's egg.
9. **Answer:** By using highly magnifying microscopes.
10. **Answer:** There are trillions of cells in human body.

Short Answer-

1. Answer: The vacuoles size varies in plant and animal. Plant cell have single large sized vacuole, whereas animal cell have numerous small sized vacuoles.
2. Answer: Organisms made up of single cell are called unicellular organisms. Organisms made up of more than one cell are called multicellular organisms.
3. Answer: Pseudopodia help Amoeba in movement and in capturing the food.
4. Answer: Cell membrane provides cell its shape. Cell membrane is important for movement of substance both inward and outward of cell.
5. Answer: Cell wall provides rigidity to plant cell.
6. Answer: Tissue is a group of similar cells performing a specific function.
7. Answer: Prokaryotes do not have well organised nucleus and Eukaryotes have well organised nucleus with nuclear membrane.
8. Answer: Tissue is composed of cell and Organ is made up of tissue.
9. Answer: Unicellular organisms: Amoeba and Paramecium.

   Multicellular organism: Human and Mouse.
10. Answer: Functions of Plasma membrane:
    - Shape to the cells of plants and animals.
    - Separates cells from one another and also the cell from the surrounding medium.
    - Allows the movement of substances or materials both inward and outward.

Long Answer-

1. Answer:

(a) Cell wall and cell membrane

Cell wall	Cell membrane
I.It is present in only plant cells.	I.It is present in both plant and animal cells.
II.It is rigid, thick structure.	II.It is delicate, thin structure.
III.It is completely permeable to ordinary molecules.	III.It is selectively permeable to molecules.
IV.It is selectively permeable to molecules.	IV.It is metabolically active and living.

(b) Leucoplast and chloroplast

Leucoplast	Chloroplast
I.It is colourless plastid.	I.It is green plastid.
II.It is found in underground parts of plants like, roots, and underground modified stems.	II.It is found in green parts of plants like leaves, stem and sepals.
III.It help in storage of food.	III.It helps in photosynthesis.

(c) Vacuole in a plant cell and an animal cell

Vacuoles in plants	Vacuoles in animals
I. Plant cell vacuoles are large in size.	I. Animal cell vacuoles are smaller in size.
II. Usually a large central vacuole is found.	II. Usually a large central vacuole is found.
III. It is usually permanent structure.	III. It is mostly temporary structure.

(d) A tissue and an organ

Tissue	Organ
It is made of similar cells. Example: Muscle tissue, connective tissue, nerve tissue, etc.	It is made of similar tissues. Example: Heart, lung, stomach, etc.

2. Answer:

Main functional regions of a cell are:

- Plasma membrane: This is the membrane which makes the outer boundary of the cells. It is very thin, delicate and selectively permeable.
- Cytoplasm: Cytoplasm is viscous, transparent jelly-like substance of the cell. It contains cell organelles.
- Nucleus: Nucleus controls the working of the cell. It is a dense oval body lying in the protoplasm of the cell.

3. Answer:

Cell membrane or plasma membrane is a thin, delicate membrane surrounding the cytoplasm.

Following are the functions of cell membrane:

- It separates the cells from one another and also separates the cells from the surrounding medium.
- It gives a definite shape to the cell.
- Being porous, it allows the movement of substances from both inside and outside the cells.
- Its porous structure helps in regulating the movement of materials through the cells.

4. Answer:

Nucleus is a dense round body found in the Centre of an animal cell and mostly on the periphery of the plant cell. The nucleus controls all the activities in the cell like digesting movement of substances within the cell. Nucleus also controls the process of cell division. This is the reason nucleus is also known as the 'brain of the cell'.

Nucleus consists of four major parts. They are:

- Nuclear membrane
- Nucleoplasm
- Nucleolus
- Chromatin