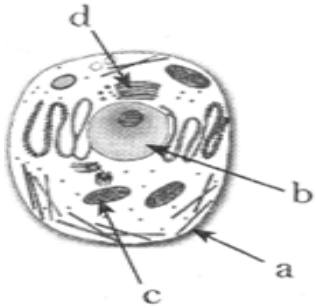
INDIAN SCHOOL AL WADI AL KABIR		
Class: VIII	**DEPARTMENT: SCIENCE-2023-24**	**Date: 06/02/2024**
WORKSHEET NO.16	**TOPIC:** **CELL - STRUCTURE AND FUNCTIONS**	**NOTE: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

I. OBJECTIVE-TYPE QUESTIONS:

1. Which one of the following is not included in the nucleus?
   a) Endoplasmic reticulum
   b) DNA
   c) Gene
   d) Chromosome
2. Which one of the following is related to the inheritance of characters from one generation to another?
   a) Cell membrane and cytoplasm
   b) Nucleolus and mitochondria
   c) Chloroplast and cell membrane
   d) Chromosomes and Genes
3. Shefali accidentally touched a glass of hot water and immediately withdrew her hand back. She reacted on sensing the heat due to:
   a) Liver cells
   b) Skin surface
   c) Heart cells
   d) Nerve cells
4. Choose the correct option for labelling the given figure of an animal cell.



   a) a - membrane, b - vacuole, c - mitochondria, d - nucleus.
   b) a - cell membrane b - nucleus, c - mitochondria, d - vacuole
   c) a - cell wall, b - nucleus, c - mitochondria, d - vacuole.
   d) a - cell wall, b - Golgi body; c - mitochondria, d - nucleus.

5. Green-coloured plastids are called:
   a) Chloroplasts
   b) Leucoplast
   c) Chromoplast
   d) Chlorophyll

6. A smaller spherical body present in the nucleus is called :
   a) Golgi bodies
   b) Mitochondria
   c) Ribosomes
   d) Nucleolus

For questions 7,8 9 and 10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below -

i) Both A and R are true and R is the correct explanation of assertion.
ii) Both A and R are true but R is not the correct explanation of the assertion.
iii) A is true but R is false.
iv) A is false but R is true

7. **Assertion (A) -** Bacteria is a prokaryote.
   Reason (R) - The bacterial cell is not surrounded by a well-defined cell membrane.
   [Hint: iii) A is true but R is false.]
8. **Assertion (A) -** The nerve cell is long and branched
   Reason (R) - To receive and transfer messages, thereby helping to control and coordinate the working of different parts of the body.
   [Hint: i) Both A and R are true and R is the correct explanation of assertion.]
9. **Assertion (A) -** Chromosomes are responsible for the transfer of characteristics from parents to offspring.
   Reason (R) - Chromosomes are present in the nucleus.
   [Hint: ii) Both A and R are true but R is not the correct explanation of assertion.]
10. **Assertion (A)-** An organ is a collection of tissues performing a similar function.
   Reason (R) - An organelle is a small, specialised structure found in the cytoplasm of the cells which carries out a specific life process.
   [Hint: ii) Both A and R are true but R is not the correct explanation of assertion.]

II. SHORT ANSWER TYPE QUESTIONS (2 M):

1. What do you mean by unicellular and multicellular organisms?
   [Hint: Organisms that consist of only one cell are called unicellular organisms while the organisms made up of more than one cell are called multicellular organisms.]
2. How is a division of labour done in the cells of living organisms?
   [Hint: Cells show a very neat division of labour, each cell has various organelles which have their function to perform.]
3. Mention three different shapes of cells in the human body.
   [Hint: i) Spherical red blood cells, ii) Spindle-shaped muscle cells, iii) Long-branched nerve cells.]

4. What are stains? Give an example of a stain.
   [Hint: Stains are the dyes which are used to colour the parts of a cell to observe them clearly under a microscope E.g. Methylene blue and safranin]
5. The table given below has certain terms and four blank spaces named A, B, C and D. From the options given below choose the correct combination of terms.

CELL	FEATURE/PART	FUNCTION
Amoeba	**A**	Movement
Plant cell	Plastid	**B**
C	Spindle-shaped	Contraction
Nerve cell	**D**	Stimuli and response

   [Hint: A-Pseudopodia; B-Photosynthesis; C-Muscle cell; D- Long and branched]
6. Why is the cell called the structural and functional unit of life?
   [Hint-. The cell is called the structural unit of life because all living organisms are made up of cells.
   A cell is capable of carrying out all the life functions, such as nutrition, excretion, respiration, etc. Hence a cell is called the functional unit of life]
7. Differentiate between an organ and an organelle.
   [Hint- An organ is the collection of tissues performing a similar function. An organelle is a small, specialised structure found in the cytoplasm of the cells which carries out a specific life process.]

III. SHORT ANSWER TYPE QUESTIONS (3 M)

1. What are the functions of cell walls in plant cells?
   [Hint- (i) To give shape and support to the plant cell. (ii) To protect against variations in temperature, atmospheric moisture, etc. (iii) to prevent water loss.].
2. Complete the given table:

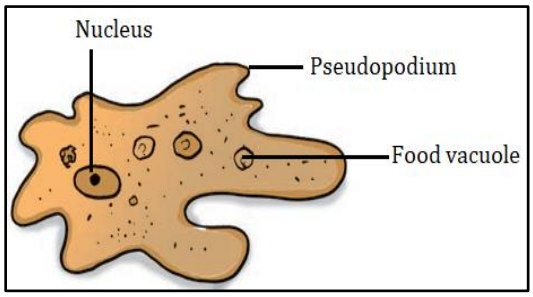
SL.NO.	DESCRIPTION	CELL PART
i)	It allows the movement of the materials in and out of the cell.	
ii)	The coloured organelles are found in the cytoplasm of a plant cell.	
iii)	The living component of a cell consists of the cytoplasm and the nucleus.	
iv)	It provides rigidity to the plant cells	

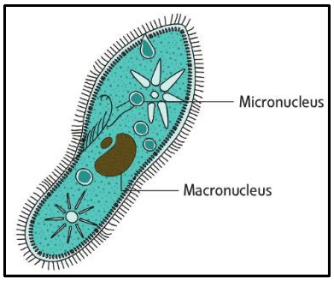
   [Hint- i) Cell membrane, ii) Plastids iii) Protoplasm iv) cell wall]

3. State the differences between plant and animal cells.
   [Hint:

PLANT CELL	ANIMAL CELL
It has a cell wall	The cell wall is absent
Plastids are present.	Plastids are absent
The vacuole is large.	Vacuoles are smaller in size

4. Discuss the importance of Cell division.
   [Hint: **Cell division** plays an **important** role in all living organisms, as it is essential for growth, repair and reproduction. This process helps in the renewal of damaged **cells**. Production of new **cells** from older ones.]
5. Distinguish between prokaryotic and eukaryotic cells with suitable examples.
   [Hint: **Prokaryotic** - Cells without well-organised nuclei i.e. lacking nuclear membrane are called prokaryotes. e.g. Bacteria and Bluegreen algae.
   Eukaryotes -The cells with well-organised nuclei with nuclear membranes are eukaryotic cells. e.g. Onion cells, Cheek cells etc.]
6. Draw a diagram of – i) Amoeba ii) Paramecium.





IV. LONG ANSWER TYPE QUESTIONS (5 M):

1. Draw a neat diagram of the following
   a) Nerve cell. b) Animal cell c) Plant cell.

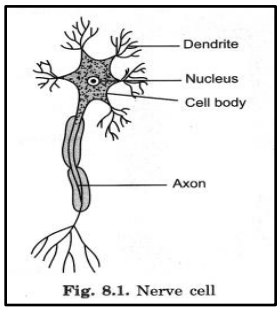
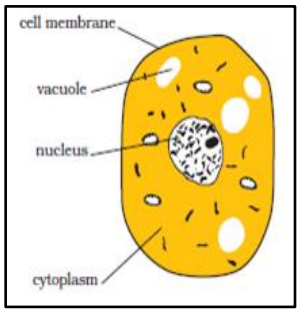
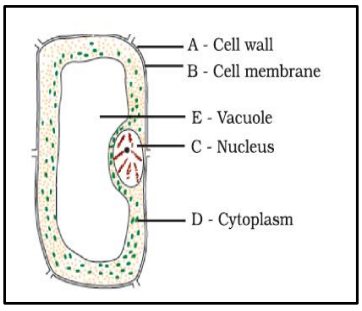


Fig. 8.1. Nerve cell





2. Write a short note on the nucleus.
   [Hint: i) It is generally spherical and located in the centre of the cell.
   ii) The nucleus is separated from the cytoplasm by a membrane called the nuclear membrane.
   iii) The nucleus contains thread-like structures called chromatin. The chromatin condenses during cell division to form chromosomes. They carry genes and help in the inheritance or transfer of characters from the parents to the offspring (young ones).
   iv) The nucleus contains a small spherical body called a nucleolus.
3. Cells consist of many organelles, yet we do not call any of these organelles a structural and functional unit of living organisms. Explain. [Hint: Although cell organelles have specific structures and perform specific functions they cannot be called structural and functional units of living organisms. This is so because they can perform their functions only when they are within a living cell. They cannot function outside the cell as an independent unit.
4. The size of the cells of an organism has no relation to the size of its body. Do you agree? Give a reason for your answer.
   [Hint- I agree because the cells in the body of an elephant are not necessarily bigger than those in a rat, it is not true that bigger organisms have cells of bigger size in their body. The size of the cell in an organism is related to the function it performs. For example, the nerve cells in both, the elephant and the rat are long and branched. They perform the same function, that of transferring messages.]
5. Observe the following diagrams and answer the following questions:

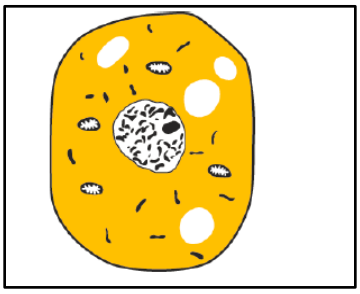


Fig. 1

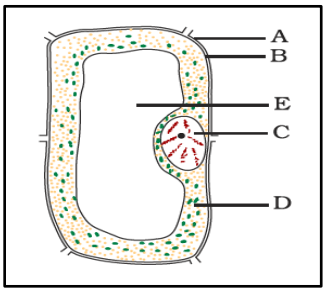


Fig. 2

   i) Identify the cells given in fig. 1 and 2
   ii) Label the parts marked in Fig. 2
   iii) Does Fig 1 represent a prokaryotic or Eukaryotic cell? Why?
   [Hint- i) Animal cell and Plant cell, ii) A-cell wall, B- Cell membrane, C- Nucleus, D- Cytoplasm, E- Vacuole iii. Eukaryotic cell, because it has a well-defined nucleus surrounded by a nuclear membrane.]

V. CASE STUDY-BASED QUESTIONS:

1.The nucleus is a spherical body present inside the cell. It acts as the control centre of the cell. It contains a thick, jelly-like substance called nucleoplasm. The nucleus is separated from the rest of the cell by a nuclear membrane. The nuclear membrane is porous and allows the movement of substances between the cytoplasm and the nucleus. A smaller spherical structure

present inside the nucleus, called nucleolus plays an important role in protein synthesis. The nucleus contains thread-like structures called chromatin. The chromatin condenses during cell division to form chromosomes. They carry genes and help in the inheritance or transfer of characters from the parents to the offspring (young ones). Genes contain the DNA (deoxyribonucleic acid) inside them. DNA forms the hereditary material in most organisms.

a) What are chromosomes? [Hint: The nucleus contains thread-like structures called chromatin. The chromatin condenses during cell division to form chromosomes.]
b) What is a gene? Write its function. [Hint- A gene is a unit of inheritance. It controls the transfer of hereditary characteristics from parents to offspring.]
c) What is protoplasm? [Hint: The entire content of a living cell is known as protoplasm. The nucleus and cytoplasm are living parts, they are together called protoplasm.]
d) What is the function of the nuclear membrane? [Hint: Nuclear membrane allows the movement of materials between the cytoplasm and the inside of the nucleus.]
e) What would happen if a cell lacks a nucleus? [Hint- The cell will die as all the main activities are controlled by the nucleus.]

2. All functions in the bodies of living organisms are performed by various systems. These systems are groups of organs performing one principal function. Each organ is made of tissues and each tissue is in turn made up of several cells. The cell is the basic structural and functional unit of life. The cells perform many functions or associated tasks. A group of cells that are specialised to perform a similar function make up a tissue. Cells are also known as the building blocks of life. They are very minute and can be observed only with the help of a microscope. Cells were discovered by Robert Hooke in 1665. He discovered cells while observing a cork under his microscope. He saw many box-like structures huddled together and separated by partitions.

a) What is a cell? Name the scientist who coined the term 'cell'
[Hint: The cell is a structural and functional unit of life. Robert Hooke]
b) What are the basic components of a cell?
[Hint: The basic components of the cell are – i) The cell membrane, ii) Cytoplasm, iii) Nucleus]
c) What are tissues?
[Hint: The groups of specialised cells to perform a special function are called tissues. E.g. Muscular tissue, blood.]

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