



# INDIAN SCHOOL AL WADI AL KABIR



<b>Class: VIII</b>	<b>DEPARTMENT: SCIENCE</b>	<b>Date: 04-08-2022</b>
<b>WORKSHEET NO.: 4 WITH ANSWERS</b>	<b>TOPIC: CELL - STRUCTURE AND FUNCTIONS</b>	<b>NOTE: A4 FILE FORMAT</b>
<b>NAME OF THE STUDENT:</b>	<b>CLASS &amp; SEC:</b>	<b>ROLL NO.</b>

## I. VERY SHORT ANSWER (1M)

1. Name the scientist who coined the term 'cell' and What is a cell?  
[Hint: Robert Hooke, Cell is a structural and functional unit of life.]
2. What are tissues? [Hint: The groups of specialised cells to perform a special function are called tissues. E.g. Muscular tissue, blood.]
3. What are the basic components of a cell? [Hint: The basic components of the cell are – i) The cell membrane, ii) Cytoplasm, iii) Nucleus]
4. A hen's egg can be seen easily. Is it a single cell or a group of cells?  
[Hint: A single cell]
5. Name the cell organelle and pigment that is responsible for the green colour in leaves.  
[Hint: Chloroplast is the organelle and chlorophyll is the pigment responsible for the green colour of leaves.]
6. What do you understand by the term cytoplasm.  
[Hint: Cytoplasm is the jellylike material, which is present between the cell membrane and the nucleus.]
7. Which of the two has a large vacuole: a plant cell or an animal cell? [Hint: A plant cell]
8. What are cell organelles? [Hint: Organelles are small structures scattered in the cytoplasm that work together to carry out life processes.]
9. Name a cell and an organism which can change its shape.  
[Hint: Organism- Amoeba, Cell- White blood cells]
10. What advantage does amoeba derive by changing shape?  
[Hint: The change in shape is due to the formation of pseudopodia which facilitates movement and helps in capturing food.]

For the question numbers 11,12 and 13, 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 assertion.
- iii) A is true but R is false.
- iv) A is false but R is true

11. **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.]

12. **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.]

13. **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.]

## **II. PASSAGE BASED QUESTIONS:**

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.

- i) The basic structural and functional unit of all living organisms is -
- a) cell
  - b) cell wall
  - c) cell membrane
  - d) chloroplasts

- ii) Which of the following instruments can be used to observe cells?
- a) Barometer
  - b) **Microscope**
  - c) Periscope
  - d) Telescope
- iii) Which of the following scientists discovered cells in cork slices?
- a) Louis Pasteur
  - b) Antonie van Leeuwenhoek
  - c) Carl Linnaeus
  - d) **Robert Hooke**
- iv) Tissues combine to form -
- a) nucleus
  - b) cells
  - c) organism
  - d) **organs**

### **III. CASE STUDY BASED QUESTIONS:**

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 rod-like structures called chromosomes. They contain the DNA (deoxyribonucleic acid) inside them. DNA forms the hereditary material in most organisms.

1. What are chromosomes? [Hint: The rod-like structures in the nucleus are called **chromosomes.**]
2. What is a gene? Write its function. [Hint- Gene is a unit of inheritance. It controls the **transfer of hereditary characteristics from parents to offspring.**]
3. Why is protoplasm called a living substance in the cell? [Hint: **protoplasm is called the living substance of the cell because the cell comprises of nucleus, cytoplasm and cell membrane. The nucleus and cytoplasm are living parts, they are together called protoplasm.**]
4. 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.**]
5. What would happen if a cell lacks a nucleus? [Hint- **The cell will die as all the main activities are controlled by the nucleus.**]

**IV. a) 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 own 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 and 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 as the structural and functional unit of life?

[Hint-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. Cell is called the structural unit of life because all living organisms are made up of cells.]

7. Differentiate between an organ and an organelle.

[Hint- An organ is the collection of tissues performing the similar function. An organelle is a small, specialised structure found in the cytoplasm of the cells which carries out a specific life process.]

#### **IV. b) SHORT ANSWER TYPE QUESTIONS (3 M)**

1. What are the functions of cell wall in plant cells?

[Hint- (i) To give shape and support to the plant cell. (ii) To provide protection against variations in temperature, atmospheric moisture, etc. (iii) prevents 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 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
Has a cell wall	Cell wall is absent
Plastids are present.	Plastids are absent
Vacuole is large.	Vacuoles are smaller in size

4. Discuss the importance of Cell division.

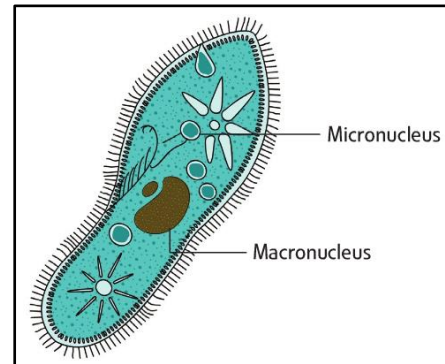
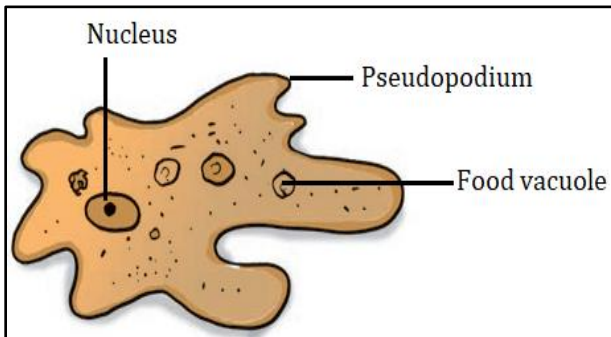
[Hint: **Cell division** plays an **important** role in all living organisms, as it is essential for growth, repair and reproduction. This process helps in: Renewing of damaged **cells**. Production of new **cells** from older ones.]

5. Distinguish between prokaryotic and eukaryotic cell with suitable examples.

[Hint: **Prokaryotic** - Cells without well organised nucleus i.e. lacking nuclear membrane are called prokaryotic cells. e.g. Bacteria and Bluegreen algae.

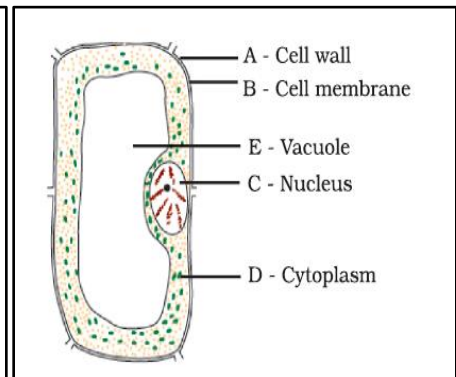
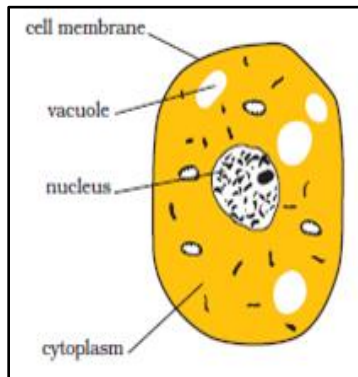
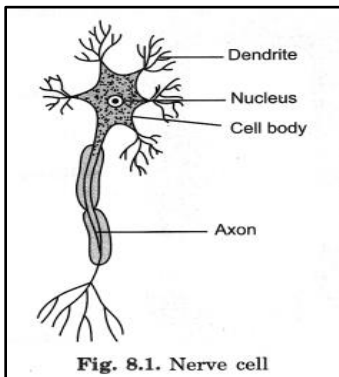
**Eukaryotes** -The cells with well organised nucleus with nuclear membrane are eukaryotic cells. e.g. Onion cells, Cheek cells etc.]

6. Draw a diagram of – i) Amoeba ii) Paramecium.



**V. LONG ANSWER TYPE QUESTIONS (5 M):**

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



2. Write a short note on 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 inheritance or transfer of characters from the parents to the offspring (young ones).

iv) The nucleus contains a small spherical body called nucleolus.

3. Cells consist of many organelles, yet we do not call any of these organelles as structural and functional unit of living organisms. Explain. [Hint: Although cell organelles have specific structures and perform specific functions but 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:

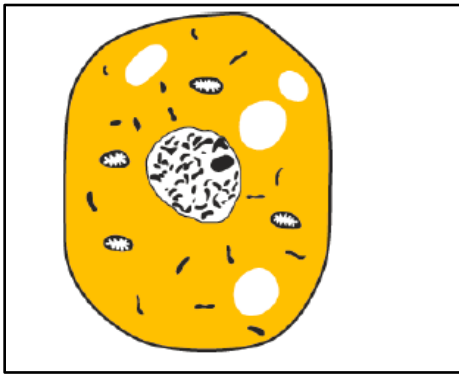


Fig. 1

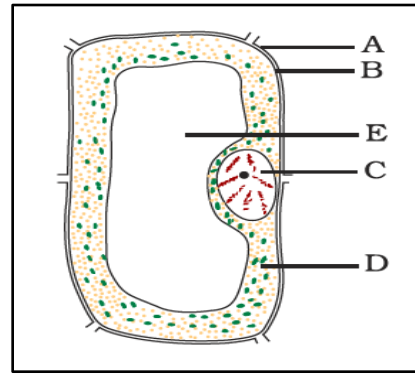


Fig. 2

- Identify the cells given in fig. 1 and 2
- Label the parts marked in fig. 2
- 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.]

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