Cell - Basic Unit Of Life

Improve your learning

Q. 1. Who discovered the cell for the first time?

Answer : The cells are the basic unit of life that make up the organism and the scientist Robert Hooke was the first person who viewed the cells under the microscope in 1665. He called these cells as *cellula* or small rooms. Though the cells that Hooke observed were dead cells.

Q. 2. Name the factors on which shape of the cells depends?

Answer : Cells are the basic unit of life and many cells together for an organ which performs a particular function. The shape of the cell usually depends on the function that the cells have to perform. For example, the muscles cells have a spindle shape to help them contract and relax, the sperm cells have a small head and a tail that helps them to swim, the RBCs have a circular doughnut shape to pass through the blood vessels easily and to carry more oxygen with them

Q. 3. Distinguish between unicellular and multi cellular organisms?

Answer :

UNICELLULAR ORGANISM	MULTICELLUALR ORGANISM
There is only 1 cell that is present	They are made up of many cells
The division of labour is in a single cell	There is a division of labor among the various same type of cells
The operational efficiency is low	The operational efficiency is high
A single cell performs all the life functions	Different cells perform the different life functions
The damage to the cell may lead to the death of the organism	The damage to the organism will not lead to the death of the organism
The life expectancy of the cells is low because of a large amount of work that has to be performed by them.	the life expectancy of the cells is more because of the division of labour.

Q. 4. How will you prepare slide without drying quickly?

Answer : In order to view the part of the organism and to study the structure of the components of the cells which is usually referred to as histology (the science of studying the structures of the cells.) the slides for the cells have to be prepared and these are then viewed under the microscope. But there are many times while preparing the slides, the sample dries up and leads to the destruction of the cellular components that will not allow the cells to be studied properly. Thus the drying up of the slides can be avoided by using the following steps.

1) Clean the slide properly

2) Place the same on the slide

3) Place a drop of water/Glycerine on the sample

4) Carefully place the coverslip on the sample avoiding air bubbles using mounting needles

Thus the is the procedure by which good slides can be prepared without the problem of the sample drying up.

Q. 5. Deekshith said that "we can't see cells with unaided eye". Is the statement true or false? Explain.

Answer : The following statements stated by Deekshit are true. The is because the cells are microscopic in nature and are very Usmalland the human eyes do not have the resolution power nor the magnification ability to see the cells that lie in the range of 100μm and the naked human eyes do not have the ability to view the cells in this range thus we need help of a microscope to see these cells.

Q. 6. Correct the statement and if necessary rewrite.

a) The cell wall is essential in plant cells.
b) The nucleus controls cell activity
c) Unicellular organisms perform all life processes like respiration, excretion, growth, and reproduction.
d) To observe nucleus and organelles clearly, staining is not necessary.

Answer : From the above-given statements it can be inferred that (a),(b),(c) are correct statements where as the statements (d) is incorrect. The staining process is an auxiliary process in which the stains are added to the cells so that they components of the cell can be easily visualized and it gives a good contrast with the background.

Thus the correct statement for (d) is that we have to do staining ignorer to see the nucleus and the cell organelles easily.

Q. 7. Describe the structure of the nucleus.

Answer : The nucleus is one of the most important and the prominent organelles that are present in the cell and in the eukaryotic system the nucleus occupies 10% of the cell volume and performs many important functions.

The nucleus consists of the nuclear envelope, the nucleolus, the chromosomes and the outer layer of the nucleus is connected to the endoplasmic reticulum. The space between the 2 layers of the nuclear envelope is fluid filled.

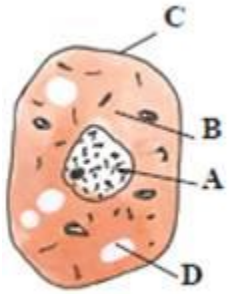
The nucleus also consists of the holes in its nuclear envelope called the nuclear pores, these pores help in the exchange of large molecules like the RNA and proteins between the cytoplasm and the nucleus.

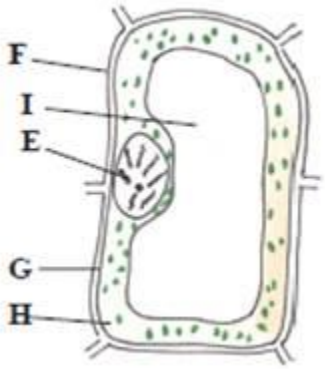
The chromosomes that are present in the nucleus play an important role in the carrying of information from one generation to another and these chromosomes are the condensed form of genes that code for the characteristics of the organism.

Q. 8. What is the difference between cells in onion peel and cells in spinach?

Answer : The cells that are present in both the samples are plant cells but the main and the most important difference that is seen when both the cells are compared are the presence of the number of the chloroplast cells that are present in both the cells as you might have seen that the onion peel is not green in colour and usually the plant gets its green colour because of the chloroplast cells, thus the number of these cells will be very less in onion peel where as the sample cells from spinach will have very large number of chloroplast cells when compared to the onion peels because spinach is. Leafy green vegetable and the leaves have the maximum number of chlorophyll cells.

Q. 9. Label parts for diagrams given on page 25, and identify which one is plant cell and





A ..... B ..... C .....

D ..... E ..... F .....

G ..... H ..... I .....

Answer : The following diagram shows 2 types of cells and the labelling is as follows :

A. chromosomes	B. cytoplasm	C. cell membrane
D. vacuoles	E. chromosomes	F. cell wall
G. cytoplasm	H. chloroplast	I. vacuole

The first figure represents the animal cell because of the following reasons

a) The small size of the cell

b) The absence of cell wall

c) The smaller size of the vacuole

d) The absence of chloroplast cells

e) The greater volume of cytoplasm

The second figure represents plant cell because of the following reasons

a) The cuboidal shape of the cells

b) The presence of cell wall

c) The large size of the vacuole

d) The presence of chloroplast cells

e) The less amount of chloroplast

Q. 10. What questions will you pose to know diversity in cells?

Answer : As we know that there are a variety of organisms present in the ecosystem and there may be a variety of the cells that may be present in these organisms. Thus in order to know the diversity of the cells that are present in the ecosystem certain questions need to be asked like what is the function that has to be performed by these cells, what is the location of these cells, whether the location of these cells determine its type, whether the cells that are present in the unicellular or multicellular organism are different, what is the difference between the cells of a frog and of a giraffe. Thus understanding these questions and finding their answers will let us know about the diversity of the cells present.

Q. 11. If you want to know about unicellular and multi cellular organisms, what questions will you pose?

Answer : The unicellular and the multicellular organism are very different in their own ways and in-order to understand these better certain questions need to posed and these are as follows

a) What is the difference between the two?

b) How can unicellular cells perform all the functions while multicellular cells cannot

c) What is the difference in the structure?

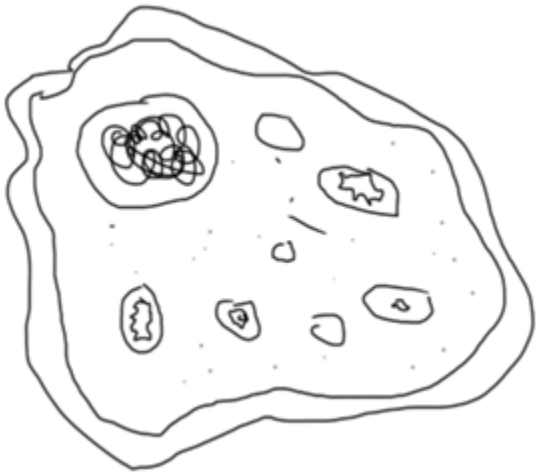
D) What is the lifespan of these cells different?

E) What will happen if the unicellular organism id damaged and how will it be different from a multicellular organism?

Thus these questions have to be posed by us in order to know the difference between both of the organisms.

Q. 12. Get some floating slime from a puddle, pick a very small amount of slime and put it on a slide. Separate out one fiber and look at it through the microscope. Draw the diagram of what you observed.

Answer : The floating slime that is observed in the pond is the footing pond algae is the most common type of the algae and when the fibers are separated from each other and they are viewed under the microscope the following structure is seen



Q. 13. Collect different kinds of leaves from your surroundings and observe the shapes of the epidermal cells under microscope. Make a table which contains serial number, name of the leaf, shape of the leaf, the shape of the epidermal cells. Do not forget to write specific findings below the table.

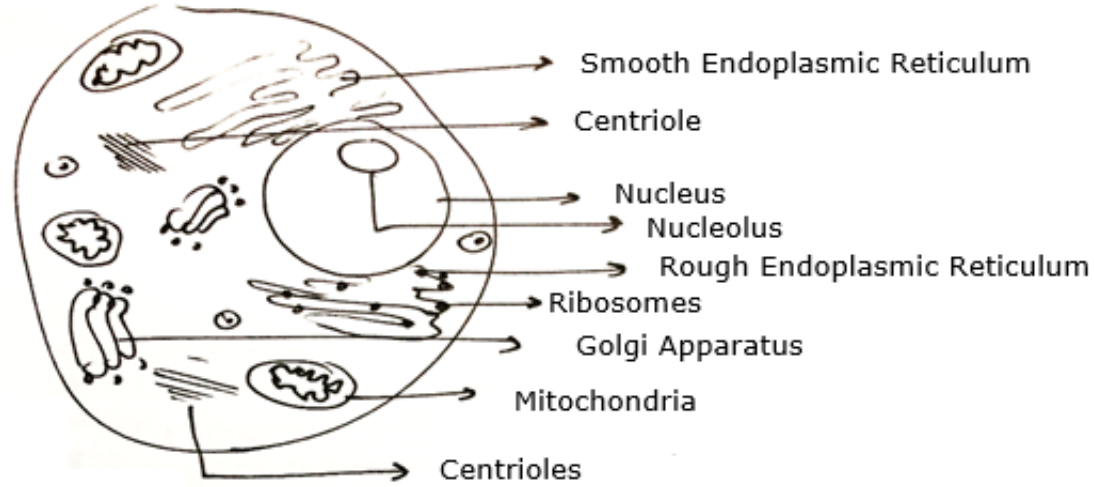
Answer : 1. Tobacco leaf shows pavement cells, stomatal guard cells, long-stalked trichomes and broader short-stalked trichomes.

2. In Arabidopsis leaf, the trichomes develop in a wave down the leaf and even the youngest trichome is separated by several pavement cells.

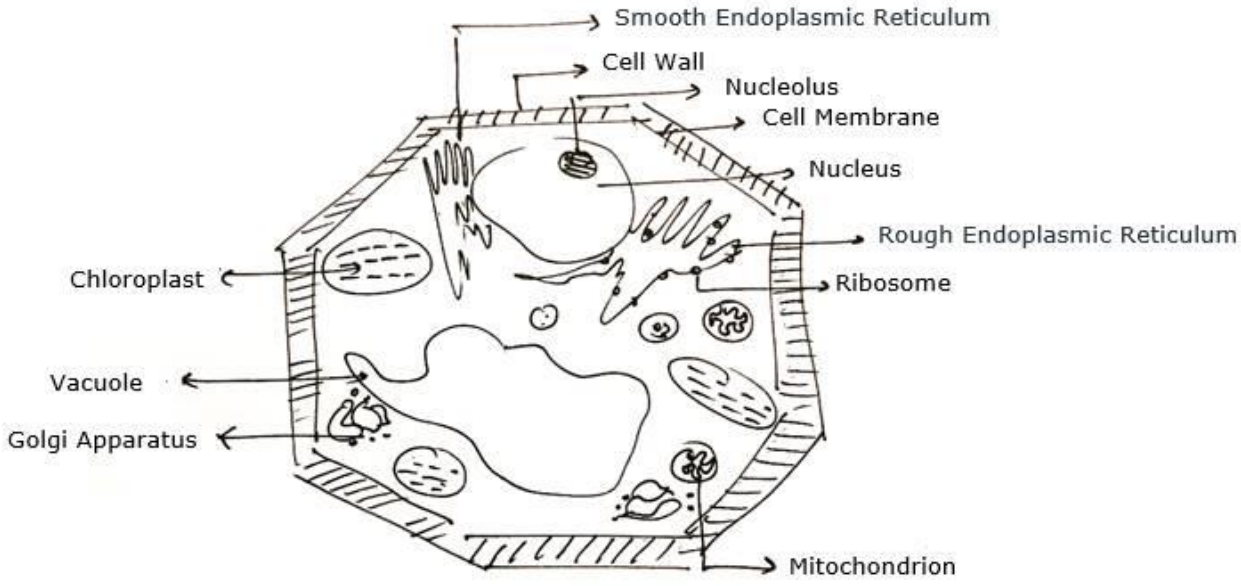
3. In dicot leaves pavement cells are shaped like the interlocking pieces of a jigsaw puzzle.

Q. 14. Make sketches of animal and plant cells which you observe under the microscope.

Answer : The following are the diagram of the plant cell and the animal cell observed under the microscope.



Animal Cell



Plant Cell

Q. 15. Ameer said "Bigger onion has larger cells when compared to the cells of smaller onions"! Do you agree with his statement or not? Explain why?

Answer : I do not agree with the segment given by Ameer because the size of the cell that is present in the organism is not dependent on the size of the organism so the bigger onion will not have bigger cells but will have ore number of the cells present in them when compared to the small onions.

Q. 16. How do you appreciate the fact that a huge elephant, man, and trees are made of cells, which are very small and we can look at them through a microscope?

Answer : The cells that are present in all the organisms listed above are the basic unit of life and these cells work together to help the organism cofunction well and also help the organism to perform the various metabolic process that is needed by the organism to stay alive. The components of the cell also referred to as the cell organelles are the main components that help the cell to perform its activities perfectly.

Q. 17. Deepak said, "A plant can't stand erect without cell wall"? Support this statement?

Answer : the segment given is true because the plant needs a support to stand tall and this support is provided by the cell wall that is present in the plant and the main reason is that the cell wall of the plant is thick, strong and sturdy and helps the plant by creating a mechanical support that helps the plant to stand tall and the plant cannot be bent or broken, it is not possible for the plant to stand erect without a cell wall.