

RAWALPORA SRINAGAR KASHMIR

Term-I

(Cass 8<sup>th</sup> - Science)

#### NCERT Solution for class 8 Science Chapter:- Cell-Structure and Functions

#### **Exercise Questions**

**1.Define a cell. Soln:** Cell is a structural and functional unit of all living organisms.

#### 2.Who discovered the cell?

Soln: Robert Hooke.

#### 3. Give three examples of unicellular organisms.

Soln: Amoeba, paramecium, euglena.

#### 4.(i) Why cells could not be observed before17th century?

**Soln:** Majority of the cells are too small to be seen with naked eye. They can only be seen with the help of microscope. Microscope was invented after 17<sup>th</sup> century, hence cells could not be observed before 17<sup>th</sup> century.

#### (ii) Why cork could not be observed as such by Hooke?

Soln. Because it is a solid structure.

#### (iii). Where did Hooke demonstrate his observations on cork slice.

Soln. Royal Society of London.

#### (iv). Name the outermost layer of an animal cell?

Soln Cell membrane or plasma membrane.

# (v). Name the layer which is present outside the plasma membrane in plant cell? Soln. Cell Wall.

#### (vi) Where are the chromosomes present in a cell?

Soln In the nucleoplasm of nucleus.

#### (vii). Name the cell part that has tiny holes?

Soln Plasma membrane and nuclear membrane.

#### (viii). Name the cell organelles which are found in the plant cell?

**Soln** Mitochondria, Chloroplasts, Endoplasmic Reticulum, Golgi complex, Lysosomes, Ribosomes, Vacoules.

## (ix). Name the cell having branched structure? Soln Nerve cells.

(x) Which call can be absorved with

# (x). Which cell can be observed with the unaided eye? Soln An Ostrich egg.

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#### 5. Mention the functions of the following.

(a) Cell membrane: Protects the cell, it provides shape to the cell, it regulates the exchange of materials between cytoplasm and extracellular fluid.

(b). Chromosome: These are thread-like structures that carry genes. All the necessary information required for the transfer of characteristics from the parents to the offspring are stored in the genes. Inheritance of characteristics is possible only because of chromosomes.

#### 6. Why are the following important to the plant cell?

Soln : (i) Cell wall: it provides rigidity and protection to the cell.

(ii). Chloroplast: it contains green pigment called chlorophyll and help in the food manufacture (photosynthesis).

(iii).Mitochondria: it performs the function of respiration and provide energy to the cell.

(iv). Nucleus: it controls everything that happens in the cell .It transmits characters from parents to offsprings.

#### 7.Draw an outline diagram of an animal cell. Label the different parts.

Soln : REFER Q.8 for diagram and draw yourself.

#### 8. Mention three difference between plant cell and animal cell.

Plant cell	Animal cell
They are large in size	They are smaller than plant cells
The cell wall is present	The cell wall is absent
Vacuoles are large	Vacuoles are small
Plastids could be seen Centrosome absent	Except for Euglena, Plastids could not be seen in animal cells. Centrosome present
Reserved food in the form of starch	Reserved food in the form of glycogen



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#### 9. What features are possessed by both plant cells and animal cells.

Soln Plasma membrane is present in both the cells.

Nucleus is present in both cells.

Mitochondria is present in both the cells and Endoplasmic reticulum, Golgi complex, Lysosomes, Ribosome present in both the cells.

10. Why are nerve cells long? Why do these cells have projections? Soln



The main function of the nerve cell is to transmit messages to the brain from receptor organs and vice versa. It has control over the working of different parts of the body. These cells have also thread like projections, as it has to convey messages to different parts of the body.

#### 11. Why is mitochondria known as the power house of the cell.

**Soln:** Because it is the site of oxidative break down of glucose in aerobic cell respiration to produce energy rich ATP molecules.

#### 12. Which four basic elements constitute more than 90% of protoplasm?

Soln: Carbon, Nitrogen, Hydrogen, Oxygen.

#### 13. Write in brief about the variation in shape and size of the cells.

(a). CELL SHAPE: Generally cells are round, spherical or elongated. Some cells are long and pointed at both ends. They exhibit spindle shape. Some are branched like nerve cell or neuron. Cells of amoeba and WBCs of our body are irregular in shape. Hence the shape of a cell is related to its function.

(b).CELL SIZE: Some cells are visible to the naked eye most cells are visible only with a microscope, eg, an ostrich egg is the largest animal cell whereas the smallest known cell is mycoplasma galisepticum. Moreover in our body nerve cells are the largest. Most other cells as that of kidney, liver ,intestine,etc are between 20 -30 microns in diameter.



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### 14. Name the different cell organelles and give their functions.

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ORGANELLE	FUNCTIONS
Mitochondria	Perform the function of respiration, provide the cell with energy.
	Contain a green pigment called chlorophyll which helps in photosynthesis.
Chloroplasts	It provides a large surface area for life functions to take place.
Endoplasmic Reticulum	It collects and distributes the substances made in the cell.
Golgi complex	Contains enzymes which help in breaking down or destroying the various
Lysosomes	materials usually toxic or unwanted.

#### 15. What is meant by protoplasm? How does it differ from cytoplasm?

**Soln**. Protoplasm includes cell membrane, cytoplasm and the nucleus. It contains various elements like carbon, hydrogen, nitrogen, oxygen etc. These elements combine to form compounds like water, carbohydrates, proteins etc. These compounds make the protoplasm living in nature whereas cytoplasm is a jelly like substance that occupies the space between cell membrane and nucleus. All the life functions take place in it. So, cytoplasm is a part of protoplasm.

#### 16. FILL UPS: (ON PAGE NO 210)

**Soln :** (i) Lysosome (ii) Robert Hooke (iii) microscope (iv) mycoplasma (v) ostrich egg (vi)nucleus, cytoplasm, cell membrane (vii) mitochondria (viii) plant.

#### **17. TRUE/FALSE Soln**: (i) FALSE (III) TRUE (IV) TRUE (V) TRUE (VI)FALSE (VII) FALSE.

#### 18. Match the statements.

#### Soln :

1. cell	unit of living body.
2. Nucleus	boss of cell.
3. Cell wall	outermost covering in plant cells.
4. Chloroplast	photosynthetic units.
5. Cytoplasm	jelly like substance present between cell membrane and nucleus.
6. Organelles	tiny structures inside cells.
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### 19. Label the different parts of a plant cell,(for diagram see page 210 of your book). Soln:

1. Cell wall2. Cytoplasm3. Cell membrane4. Nucleus5. Vacuole6.Mitochondria



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#### **IMPORTANT ADDITIONAL QUESTIONS:**

Write short notes on the following. (a) Cytoplasm (b) Nucleus of a cell Soln:

(a) Cytoplasm:

The cytoplasm is a fluid that contains all the cell organelles such as the Mitochondria, Ribosomes, Golgi bodies, etc. It is present between the nucleus and the plasma membrane. It helps in the exchange of materials between cell organelles. It is made up of eighty percent water and is usually clear and colourless.

(b) The nucleus of a cell:

The Nucleus is a double-membrane bound cell organelle present in eukaryotic cells. It contains the DNA, the genetic material. It is the command centre of the cell and is spherical in shape. It has the following components:



- Nuclear membrane
- Nucleolus
- Chromosomes

#### 1. Nuclear membrane:

It has is a double-layered membrane. It separates the contents of the nucleus from the cytoplasm and acts as a wall. It has pores that allow the transfer of certain substances in and out of the cell.

#### 2. Nucleolus:

It is a small dense spherical body. It is not bound by any membrane.

#### 3. Chromosome:

These are thread-like structures that carry genes. All the necessary information required for the transfer of characteristics from the parents to the offspring are stored in the genes. Inheritance of characteristics is possible only because of chromosomes.

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#### Which part of the cell contains organelles?

#### Soln:

Various cell organelles are present in the cytoplasm. It is a clear and colourless fluid that contains organelles like Mitochondria, Ribosome's, Golgi bodies.

# Make sketches of animal and plant cells. State three differences between them. Soln:

Plant cell	Animal cell
They are large in size	They are smaller than plant cells
The cell wall is present	The cell wall is absent
Vacuoles are large	Vacuoles are small
Plastids could be seen	Except for Euglena, Plastids could not be seen in animal cells.



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#### . State the difference between eukaryotes and prokaryotes.

Prokaryotes	Eukaryotes
Most of them are unicellular	Most of them are multicellular
There is no nuclear membrane. So, the nucleus is poorly defined	There is a nuclear membrane. So, the nucleus is well defined
Not all cell organelles are present	All the cell organelles are present.
Nucleolus is absent	Nucleolus is present
Eg: Blue-green algae, Bacteria	Eg: Plant, Animal cells and Fungi.

#### Where are chromosomes found in a cell? State their function.

**Soln:** Chromosomes are thread-like structures present in the nucleus that carry genes. All the necessary information required for the transfer of characteristics from the parents to the offspring are stored in the genes. Inheritance of characteristics is possible only because of chromosomes.

#### 'Cells are the basic structural units of living organisms'. Explain.

**Soln:** Various components of plants and animals are constituted by cells. It is the smallest unit of life and is capable of all living functions. They are the building blocks of life. That is the reason why cells are referred to as 'the basic structural and functional blocks of life'.

Cells exist in various shapes and sizes and perform a wide range of activities.

Their shapes and sizes are related to the function it performs.

#### Explain why chloroplasts are found only in plant cells?

Soln: Chloroplasts are plastids required for the food making process, called photosynthesis, and thus they are only

present in plant cells.

. Complete the crossword with the help of clues given below.

#### Across

- 1. This is necessary for photosynthesis.
- 3. Term for component present in the cytoplasm.
- 6. The living substance in the cell.
- 8. Units of inheritance present on the chromosomes.

#### Down

- 1. Green plastids.
- 2. Formed by collection of tissues.
- 4. It separates the contents of the cell from the surrounding medium.
- 5. Empty structure in the cytoplasm.



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#### 7. A group of cells.

#### Soln:

#### Across

- 1. Chlorophyll
- Organelle
  Protoplasm
- 4. Genes

#### Down

- 1. Chloroplasts
- 2. Organ
- 3. Membrane
- 4. Vacuole
- 5. Tissue

