



INDIAN SCHOOL AL WADI AL KABIR



<b>Class: IX</b>	<b>DEPARTMENT OF SCIENCE -2022-23</b> <b>SUBJECT: BIOLOGY</b>	<b>DATE OF COMPLETION:</b> 11.08.22
<b>WORKSHEET NO:2</b> <b>WITH ANSWERS</b>	<b>TOPIC: THE FUNDAMENTAL UNIT</b> <b>OF LIFE-PART II</b>	<b>A4 FILE FORMAT</b> <b>(PORTFOLIO)</b>
<b>CLASS &amp; SEC:</b>	<b>NAME OF THE STUDENT:</b>	<b>ROLL NO.</b>

**I. MULTIPLE CHOICE QUESTIONS.**

<b>Class: VIII</b>	<b>Department: SCIENCE</b>	<b>Date: 16.04.2020</b>
<b>Worksheet No.: 1</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>

1. How endoplasmic reticulum helps transport protein between various regions of the cytoplasm?

- a) By forming a network of membrane-bound tubes in the cytoplasm.
- b) By occupying most of the space in the cytoplasm.
- c) By generating small transport vesicles throughout the cell.
- d) By directing all cell organelles to perform the same biochemical activity.

2. What is the main function of mitochondria?

- a) To stop the chemical reaction in the cell and store ATP as energy.
- b) To perform all the chemical reactions of the cell using ATP.
- c) To use energy currency in the form of ATP.
- d) To produce ATP molecules.

3. In summers, leaves of a potted plant droops when the soil becomes dry. Which cell organelle makes the leaves to droop?

- a) Nucleus, as it stops making DNA.
- b) Cell wall, as it starts to shrink.
- c) Lysosome, as it is releasing the digestive enzymes.
- d) Vacuole, as it loses all the water.

4. What part of the cell serves as the intracellular highway?

- a) Endoplasmic reticulum
- b) Golgi apparatus
- c) Cell membrane
- d) Mitochondria

## **II. ASSERTION AND REASONING:**

For the questions 6 to 8, two statements are given—one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the options (i), (ii), (iii) and (iv) as given below:

- (i) Both A and R are true and R is the correct explanation of the 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.

6. **Assertion (A):** Mitochondria and chloroplasts are semiautonomous organelles.

**Reason (R):** They are formed by division of pre-existing organelles as well as contain DNA but lack protein synthesizing machinery.

7. **Assertion (A):** Mitochondria are known as the power house of the cell.

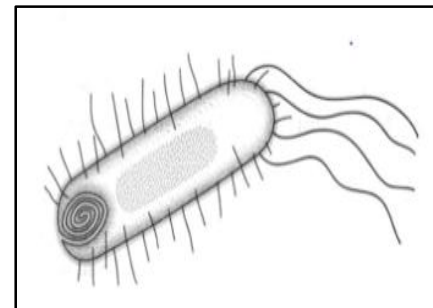
**Reason (R):** Mitochondria are strange organelles in the sense that they have their own DNA and ribosomes.

8. **Assertion (A):** Vacuoles are storage sacs for solid or liquid contents.

**Reason (R):** In amoeba the vacuoles do not help in expelling excess water from the cell.

## **III. PASSAGE BASED QUESTIONS:**

Mohan had a biology practical exam. The biology laboratory in his school had lots of microscopes of different precision. When he reached the laboratory, he found that many microscopes were already mounted with a slide. Just for fun, he went and looked at a slide through the microscope and found the image given alongside. He wasn't able to identify the organism or type of organism, so he called his friend Shyam to look at the slide. Shyam found out immediately what kind of organism this was.



- a) Identify the above given organism?
- b) How did Shyam find out the kind of organism?
- c) Give two examples of such kind of organisms.
- d) What is a nucleoid?

## **IV.a) SHORT ANSWER TYPE QUESTIONS (2M):**

- 9. What is the significance of pores present on the nuclear membrane?
- 10. Why is Golgi apparatus called the secretory organelle of the cell?
- 11. Which organelle is called the 'digestive bags' of the cell?
- 12. Draw a neat labelled diagram of a typical prokaryotic cell.
- 13. Write the functions of:
  - i) Inner membrane of mitochondria.
  - ii) Ribosomes present in active cells.

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

- 14. What are the similarities and dissimilarities between mitochondria and plastid?
- 15. Differentiate between rough and smooth endoplasmic reticulum. How is endoplasmic reticulum important for membrane biogenesis?

16. How is a bacterial cell different from an onion peel cell?  
 17. Describe the structure of plastids with special reference to its types.

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

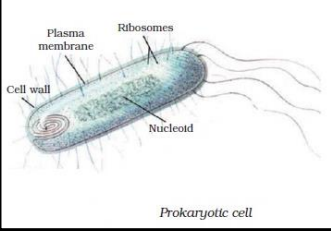
18. Illustrate a plant cell as seen under electron microscope. How is it different from animal cell?  
 19.a) Explain in details the structure of nucleus.  
     b) Draw a neat labelled diagram of animal cell.  
 20.a) What is cell division?  
     b) Why is cell division necessary?  
     c) State the differences between mitosis and meiosis.

**VI. BOARD BASED QUESTIONS:**

21. Name two cell organelles having double membrane envelope. (1m)  
 22. Grass looks green, papaya appears yellow. Which is the cell organelle responsible for this? Write the structural features of this organelle.

**ANSWERS**

1	d) It helps detoxify the drugs.
2.	c) By generating small transport vesicles throughout the cell.
3.	d) To produce ATP molecules.
4.	d) Vacuole, as it loses all the water.
5.	a) Endoplasmic reticulum
	<b><u>II. ASSERTION AND REASONING:</u></b>
6.	(iii)A is true but R is false.
7.	(ii)Both A and R are true but R is not the correct explanation of the assertion.
8.	(iii)A is true but R is false.
	a) Prokaryotic cell b) Shyam saw that this organism does not contain nucleus, it contains genetic material without nuclear membrane, nucleolus. So it is a prokaryotic organism. c) Bacteria, blue green algae d) A nucleoid is an irregular shape region in a prokaryotic cell that comprises most of the genetic material. A membrane does not enclose it. DNA is found in nucleoid.
	<b><u>III.a) SHORT ANSWER TYPE QUESTIONS (2 M):</u></b>
9.	The pores present on the nuclear membrane allow transport of water-soluble molecules across the nuclear envelope. RNA and ribosomes move out of the nucleus, whereas carbohydrates, lipids and proteins move into the nucleus.
10	This is because it packages material synthesised in the ER and dispatches it to intracellular (plasma membrane and lysosomes) and extracellular (cell surface) targets.
11	Lysosomes are cell organelles found in eukaryotic cells. They are also called as suicidal bags. They contain digestive enzymes and lysozymes which breaks down the waste material and foreign particles. They also destroys the cell after it has died.

12	 <p style="text-align: center;">Prokaryotic cell</p>													
13	<p>The functions are: -</p> <p>(i) Inner membrane of mitochondria is deeply folded and these folds create large surface area for ATP generation.</p> <p>(ii) Ribosomes present in active cells are the sites for protein synthesis.</p>													
<b>III.b)SHORT ANSWER TYPE QUESTIONS (3 M):</b>														
14	<p>Similarities of between mitochondria and plastid are:</p> <p>-Mitochondria and plastids are double membrane-bound organelles.</p> <p>-Mitochondria and plastids have some of their own DNA for protein synthesis hence they are called semi-autonomous cell organelles.</p> <table border="1" data-bbox="272 758 1398 982"> <thead> <tr> <th style="text-align: center;">Mitochondria</th> <th style="text-align: center;">Plastid</th> </tr> </thead> <tbody> <tr> <td>Found in all eukaryotic cells</td> <td>Found in only plant cells</td> </tr> <tr> <td>Produces ATP</td> <td>Produces glucose and stores it as starch</td> </tr> <tr> <td>The main function is cell respiration</td> <td>Main organelle for photosynthesis</td> </tr> <tr> <td>Smaller in size</td> <td>Comparatively larger in size</td> </tr> <tr> <td>Pigments are absent</td> <td>Pigments are present</td> </tr> </tbody> </table>		Mitochondria	Plastid	Found in all eukaryotic cells	Found in only plant cells	Produces ATP	Produces glucose and stores it as starch	The main function is cell respiration	Main organelle for photosynthesis	Smaller in size	Comparatively larger in size	Pigments are absent	Pigments are present
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	5. Membrane bound cell organelles are absent.	5. Membrane bound cell organelles such as mitochondria, plastids, endoplasmic reticulum, Golgi apparatus, lysosomes, peroxisomes, etc., are present.
	6. Cell division takes place by fission or budding (no mitosis).	6. Cell division occurs by mitotic or meiotic cell division.

17 . Plastids are only found in plant cells. They are of two types: -

a) Chromoplasts (coloured plastids) and leucoplasts (white or colourless plastids)  
 Chromoplasts containing chlorophyll are called chloroplast –It is green colored plastid. Chloroplasts are double membrane organelles containing two distinct regions

1. Grana are stacks of membrane bounded flattened sacs called thylakoids containing chlorophyll.
2. Stroma is the homogenous matrix in which grana are embedded. Chlorophyll actually helps in capturing solar energy and converting it to chemical energy of food.

Functions of plastids are as follows:-

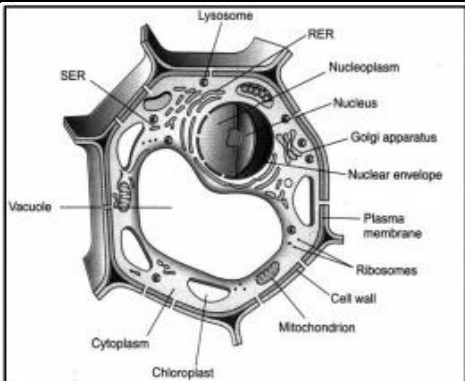
a) Chloroplast helps in photosynthesis. Chloroplast also contain various yellow or orange pigments in addition to chlorophyll. These coloured plastids imparts colour to flowers. Plastids contain their own DNA and ribosomes i.e., they have their own protein synthesising machinery. They are also self-replicating organelles.

b) Leucoplast – is a colourless plastid and stores starch, oils and protein granules.

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

18 .

a)

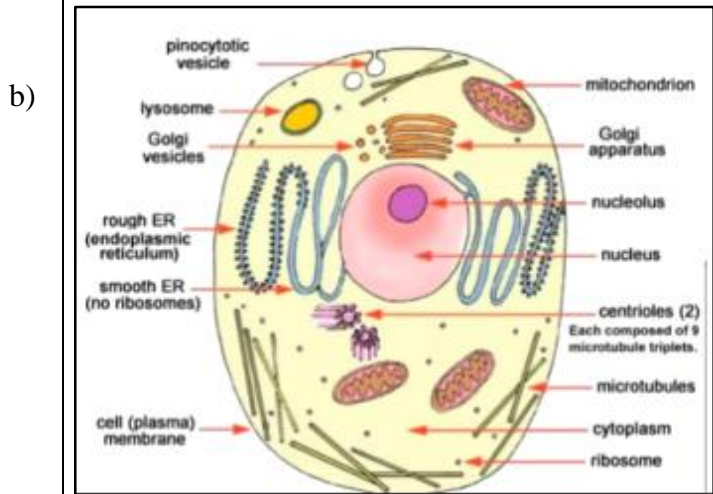


b)

Plant cell	Animal wall
1. Cell wall is present. The cell membrane is surrounded by the cell wall.	1. Cell wall is absent.
2. Plastids are present.	2. Plastids are absent.
3. A large vacuole is present in the centre.	3. Vacuoles are absent; however, if present, they are small.
4. Cytoplasm is not so dense.	4. Cytoplasm is denser and more granular and almost fills the entire cell.
5. Golgi apparatus has smaller units called dictyosomes.	5. Golgi apparatus is highly complex and prominent.

19 .  
a) The nucleus has a double layered covering called nuclear membrane. The nuclear membrane has pores which allow the transfer of material from inside the nucleus to its outside, that is, to the cytoplasm. The nucleus contains chromosomes, which are visible as rod-shaped structures only when the cell is about to divide. Chromosomes contain information for inheritance of features from parents to next generation in the form of DNA (Deoxyribo Nucleic Acid). DNA molecules contain the information necessary for constructing and organising cells.

Functional segments of DNA are called genes. In a cell which is not dividing, this DNA is present as part of chromatin material. Chromatin material is visible as entangled mass of thread like structures. Whenever the cell is about to divide, the chromatin material gets organised into chromosomes. The nucleolus is almost spherical structure found inside the nucleus. It contains RNA (ribonucleic acid) and proteins which help in protein synthesis in the cytoplasm.



20 .  
a) Cell division is a process by which a parent cell divides into two or more daughter cells.  
b) Cell division is necessary because of following reason:-  
-A cell has to divide to maintain continuity from one generation to another generation.  
-In multicellular organisms, it plays an important role in the formation of gamete.  
-Old and worn out cells are regularly repaired by means of cell division.  
-In unicellular organisms like amoeba, cell division is the means of reproduction whereas in multicellular organisms; it is the means of tissue growth and maintenance.

c)

Mitosis	Meiosis
It takes place in somatic cells.	It takes place in germ cells at the time of gamete formation.
Two daughter cells are formed.	Four daughter cells are formed.
The daughter cells have the same number of chromosomes as mother cell.	The new cells only have half the number of chromosomes than that of the mother cells.
It helps in growth and repair of tissues in organisms.	It is necessary for sexual reproduction.

<b><u>VI. BOARD BASED QUESTIONS:</u></b>	
20	Nucleus, mitochondria (1m)
21	Plastids - Chromoplasts – chloroplast (3m) Structure:-Each chloroplast has a double membrane. The inner matrix called stroma has flattened stack of thylakoids called grana. Chloroplast have their own DNA and ribosomes.

PREPARED BY: MS. SREEJA A	CHECKED BY: HOD-SCIENCE
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