
	INDIAN SCHOOL AL WADI AL KABIR	
Class: XI SUBJECT: BIOLOGY	Department: SCIENCE 2023-24	Date of submission: 21.05.2023
Worksheet 1 with answers	CHAPTER: Cell: The unit of life	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

CASE STUDY question (2 x 2 marks)

In 1838, Matthias Schleiden, a German botanist, examined many plants and observed that all plants are composed of different kinds of cells which form the tissues of the plant. At about the same time, Theodore Schwann (1839), a British Zoologist, studied different types of animal cells and reported that cells had a thin outer layer which is today known as the 'plasma membrane'. He also concluded, based on his studies on plant tissues, that the presence of a cell wall is a unique character of the plant cells. Based on this, Schwann proposed the hypothesis that the bodies of animals and plants are composed of cells and products of cells.

Schleiden and Schwann together formulated the cell theory. However, this theory did not explain how new cells were formed. Rudolf Virchow (1855) first explained that cells are divided, and new cells are formed from pre-existing cells (Omnis cellula-e cellula). He modified the hypothesis of Schleiden and Schwann to give the cell theory a final shape. Cell theory as understood today is: (i) all living organisms are composed of cells and products of cells. (ii) All cells arise from pre-existing cells.

1.) Identify the incorrect statement.

Statement 1 – Theodore Schwann reported the presence of a cell membrane.

Statement 2 – Rudolph Virchow gave the cell theory a final shape.

Statement 3 – New cells arise from pre-existing cells.

Statement 4 – Living organisms are composed of cells and products of cells.

- a.) Statement 1 and 3 are incorrect
- b.) Statement 2 and 3 are incorrect
- c.) Statement 4 is incorrect
- d.) All statements are correct

2.) _____ proposed the theory, that states that the bodies of animals and plants are composed of cells and products of cells.

- a) Antony Von Leeuwenhoek
- b) Matthias Schleiden (1838)
- c) Rudolph Virchow (1855)
- d.) Theodore Schwann (1839)

Objective Type Questions (1 Mark each)

Q3. Which of the following is not correct?

- 1) Robert Brown discovered the cell.
- 2) Schleiden and Schwann formulate cell theory.
- 3) Virchow explained that cells are formed from pre-existing cells.
- 4) A unicellular organism carries out its life activities with a single cell.

Q4. The cell organelle involved in the glycosylation of protein is

- 1) ER
- 2) Mitochondria
- 3) Peroxisome
- 4) Ribosome

Q5. The outer layer of the vacuole is called.

- 1) leucoplast
- 2) tonoplast
- 3) cell wall
- 4) plasma layer

Q6. Which of the following cell organelle remains enveloped by a single unit membrane?

- 1) Chloroplast
- 2) Mitochondria
- 3) Nucleus
- 4) Lysosomes

Q7. The nucleolus is the site of the formation of

- 1) Spindle fibers
- 2) Ribosomes
- 3) Chromosomes
- 4) Peroxisomes

Q8. Which one of the following combinations is mismatched?

- 1) Cell wall - Protective, determines the shape, prevents from bursting.
- 2) Flagella, Pili and Fimbriae - Surface structures of bacterial cell
- 3) Pili - Reproduction
- 4) Glycocalyx - may be a capsule or slime layer.

Q9. The cell as a basic unit of structure of living beings was discovered by.

- 1) Schleiden and Schwann
- 2) Gregor Mendel
- 3) Robert Hooke
- 4) Aristotle

Q10. Which pair of structures are usually found in both plant and animal cells?

- 1) Cell membrane and cell wall
- 2) Cell Membrane and nucleolus
- 3) Nucleolus and chloroplast
- 4) Nucleus and cell wall

Q11. Assertion: RBC membrane is highly flexible.

Reason: The amount of external protein in the cytoplasmic face of the membrane is more.

- A. Assertion and Reason are true, and the reason is the correct explanation.
- B. Assertion and Reason are true, but the reason is not the correct explanation
- C. Assertion is a true statement, but Reason is false.
- D. Assertion and Reason are false statements.

Q12. Assertion: Lysosomes help in digestion of foreign particles in the animal cells.

Reason: They have respiratory enzymes.

- A. Assertion and reason are true, and the reason is the correct explanation of the assertion.
- B. Assertion and reason are true, and the reason is not the correct explanation of the assertion.
- C. Assertion is a true statement, but Reason is false.
- D. Both Assertion and Reason are false statements.

Short Answer type Questions (2 Marks each)

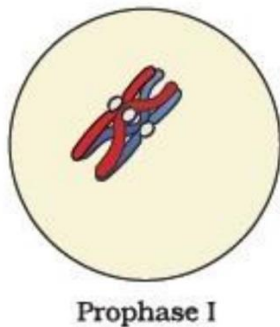
- Q13. a) Which cell has a shorter cell division time between a prokaryote and a eukaryote?
 b) Which of the phases of the cell cycle is of the longest duration?

Q14. Which tissue of animals and plants exhibits meiosis? Give a reason for your answer.

Q15. a) Given that the average duplication time of *E. coli* is 20 minutes, how much time will two *E. coli* cells take to become 32 cells?

b) What attributes does a chromatid require to be classified as a chromosome?

Q16. a) The diagram shows a bivalent at prophase-I of meiosis. Which of the four chromatids can cross over? Briefly explain the process.



Q17. Draw a neatly labeled structure of nucleus.

OR

Diagrammatically represent the types of chromosomes based on the position of centrosome.

Q18. What are unicellular organisms? give two examples.

Q19. Why is it considered that the nucleolus's contents are continuous with nucleoplasm?

Q20. What are plasmodesmata? what is their function?

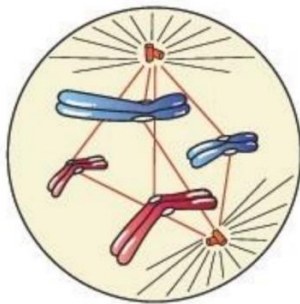
Long Answer Type Question (3 Mark Each)

Q21. Who proposed the fluid mosaic model of plasma membrane? Describe the fluid mosaic model of plasma membrane with the help of a labelled diagram.

Q22. Draw a diagram of an animal cell and label any ten parts in it.

Q23. a) State the role of centrioles in cell division.
b) Mitochondria and plastids have their own DNA (genetic material). What is known about their fate during nuclear division like mitosis?

Q24. a) Label the diagram and also determine the stage and any two features of this stage.



b) A cell has 32 chromosomes. It undergoes mitotic division. What will be the chromosome number (N) during metaphase? What would be the DNA content during anaphase? Give reasons for each answer.

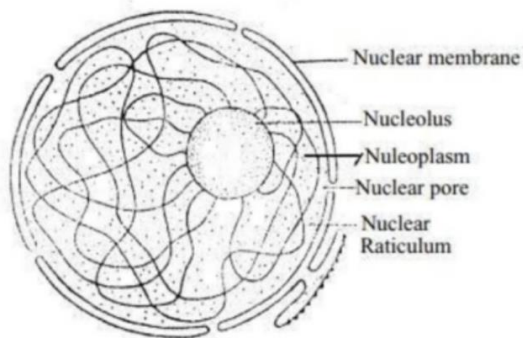
Answers to the questions.

Case study Answers (2 Marks)

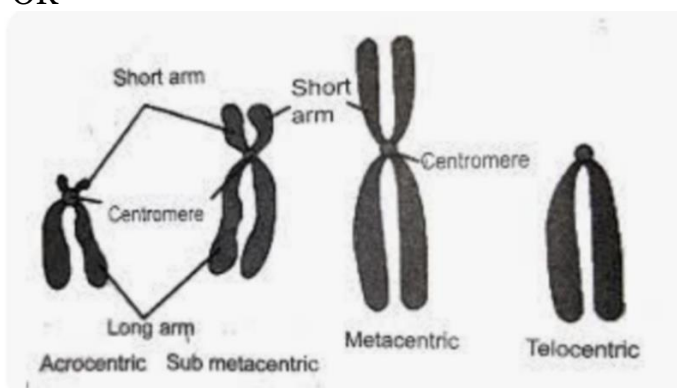
1. d.) All statement is correct.
2. Rudolph Virchow (1855)

Objective type Questions (1 mark Each)

3. Robert Brown discovered the cell.
4. ER
5. Tonoplast
6. Lysosome
7. Ribosomes
8. Pili-Reproduction
9. Schleiden and Schwann
10. Cell membrane and Nucleolus
11. Extrinsic Proteins are more towards the cytoplasmic face of the plasma membrane.
12. Lysosomes have hydrolytic enzymes.
- 13.a) Prokaryotes
b) Interphase
14. Germ cells or meicytes- to form gametes with half the no. of chromosomes (unpaired) –
gametes fertilize to form Zygote (paired) -chromosomal no. retained.
- 15.
- 16.(Top two) Non-sister chromatids- Exchange of genetic material between two homologous chromosomes
- 17.



OR



18. Unicellular organisms are living organisms which can perform all the functions of a living organism within one cell. Example: Bacteria, protists.

19. Because there is no boundary membrane for the nucleolus.

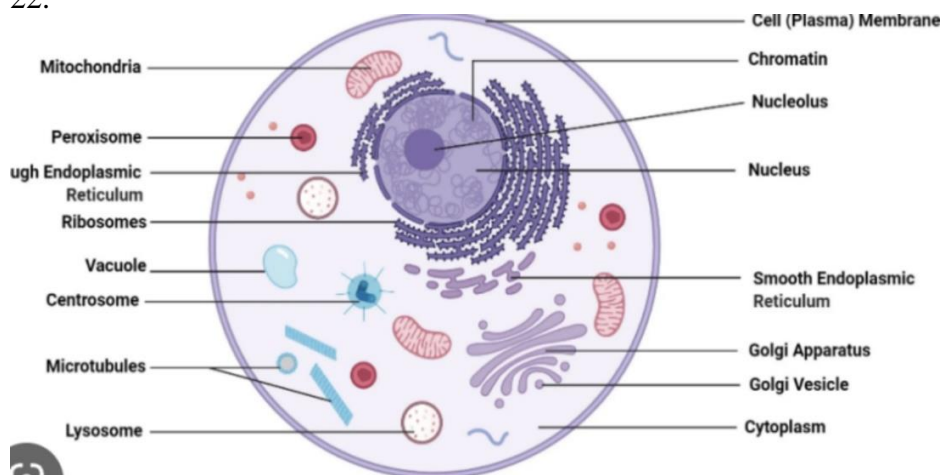
20. Plasmodesmata are the cytoplasmic bridges, that transverse the primary cell wall and middle lamella and connect the adjacent cells.

21. proposed by Singer and Nicolson

- lipids are arranged within the membrane, with the polar head towards the outer sides (outer and inner) and the hydrophobic tails towards the inner part; this makes the non-polar tail of saturated hydrocarbons protected from the aqueous environment.

- this model accounts for the quasifluid nature of membrane, that facilitates the movement of proteins in the phospholipid bilayer.

22.



23. Centromere is the non-strained region that holds the chromatids together in a chromosome.

24. a) Metaphase, the sister chromatids align along the equator of the cell by attaching their centromeres to the spindle fibres.

b) N, 2C

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