Unit 2 · The Cell

WORKSHEET

Full marks 39

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 39

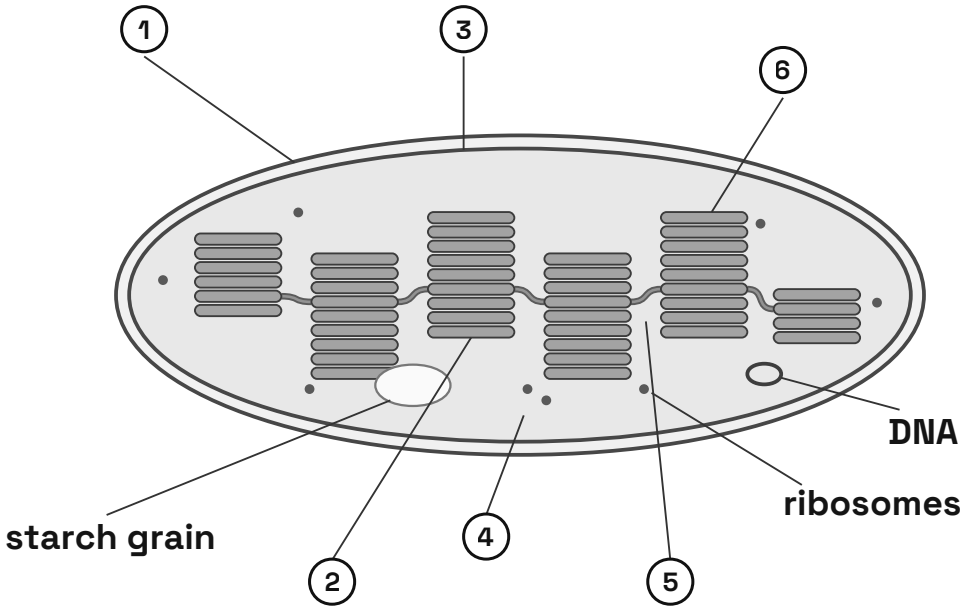
1 Key words [4]

Match each term in column A with its description in column B. Two items in column B are not needed. Each match carries 0.5 mark.

Column A		Column B
1. plasmodesmata	☐	**a.** several ribosomes working along one strand of mRNA
2. middle lamella	☐	**b.** the separate small Golgi stacks of a plant cell
3. cyclosis	☐	**c.** folds of the inner membrane of a mitochondrion
4. cristae	☐	**d.** tightly packed, darkly staining chromatin whose genes are mostly inactive
5. dictyosomes	☐	**e.** the streaming of the cytoplasm round a plant cell
6. autophagy	☐	**f.** a dense body in the nucleus with a membrane of its own
7. polysome	☐	**g.** channels through cell walls joining the cytoplasm of neighboring cells
8. heterochromatin	☐	**h.** the digestion of a cell's whole contents after its death
		i. the digestion of a cell's own worn-out organelles by lysosomes
		j. a layer of calcium and magnesium pectates cementing neighboring cell walls

2 Label the diagram [3]

The diagram shows a chloroplast cut lengthwise. Write the names of the parts 1 to 6. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____ **4.** _____

5. _____ **6.** _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. What enzyme is responsible for the synthesis of ATP in mitochondria? [1]

a. Oxidase
b. ATP synthase (also called ATP synthetase, or ATPase)
c. Ribonuclease
d. Hexokinase

ii. Which of the following organelles is not membrane-bound? [1]

a. Mitochondrion **b.** Chloroplast
c. Plastid **d.** Ribosome

iii. A ribosome of 50S joins one of 30S. What is the whole ribosome, and where could it be found? [1]

a. 80S, in the cytoplasm of a plant cell
b. 70S, in a bacterium or inside a mitochondrion
c. 80S, in a bacterium
d. 70S, on the rough ER of a liver cell

iv. In a cross-section of a cilium, which part makes it beat? [1]

a. the two central microtubules, made of dynein
b. the basal body's triplets
c. the dynein arms on the A tubules of the doublets
d. the plasma membrane round the shaft

v. A cell from the pancreas makes large amounts of a digestive enzyme for export. Which of its parts would you expect to be especially well developed? [1]

a. smooth ER and lysosomes
b. rough ER and the Golgi complex
c. chloroplasts and cell wall
d. nucleoid and plasmids

4 Very short answers [3]

Write very short answers to the following questions.

a. Name two semi-autonomous organelles. [1]

b. What is the protoplast of a plant cell? [1]

c. A potato tuber left in sunlight turns green. Which change of plastid explains this? [1]

5 Short answers [9]

Write short answers to the following questions.

a. Which organelle is called the "suicidal bag"? Why is it called so? [2]

b. Write any four differences between smooth ER and rough ER. [2]

c. A mammal's mature red blood cell has no nucleus and no mitochondria. Give one disadvantage and one advantage of this. [2]

d. Write the three kinds of lysosome named by what is inside them, and say how each forms. **[3]**

6 Numerical problems **[4]**

Solve the following problem. Show your working.

Treat a cell as a cube. i. Find the surface area, the volume and the surface area for each unit of volume of a cube of side 1 μm and of a cube of side 10 μm. ii. By how many times did the volume grow, and by how many times the surface? iii. Use your answer to explain why most cells are small.

Answer:

7 Long answers **[8]**

Write long answers to the following questions.

a. Describe the fluid mosaic model of the plasma membrane. How does it differ from the sandwich model? **[4]**

b. Trace the path of a digestive enzyme in a pancreatic cell, from its gene to the outside of the cell, naming each part of the cell it depends on. **[4]**

8 Think **[3]**

Mitochondria and chloroplasts are thought to have come from bacteria that lived inside another cell. Give three pieces of evidence from their structure, and say why they still can't live on their own.

9 Activity: Watch the cytoplasm stream (not marked)

You need a young leaf of *Hydrilla* or pondweed, a slide, a cover slip, a dropper, a lamp and a microscope. Mount the leaf in a drop of water, warm the slide under the lamp for a minute or two, and look with the 10× and then the 40× objective.

What you looked at	What you saw
the shape of one cell	
the green bodies inside it	
how they move, and which way	
after warming the slide	

What is this movement called, and what drives it?