Unit 2 · Life and Life Process

WORKSHEET

Full marks 46

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 46

1 Key words [4]

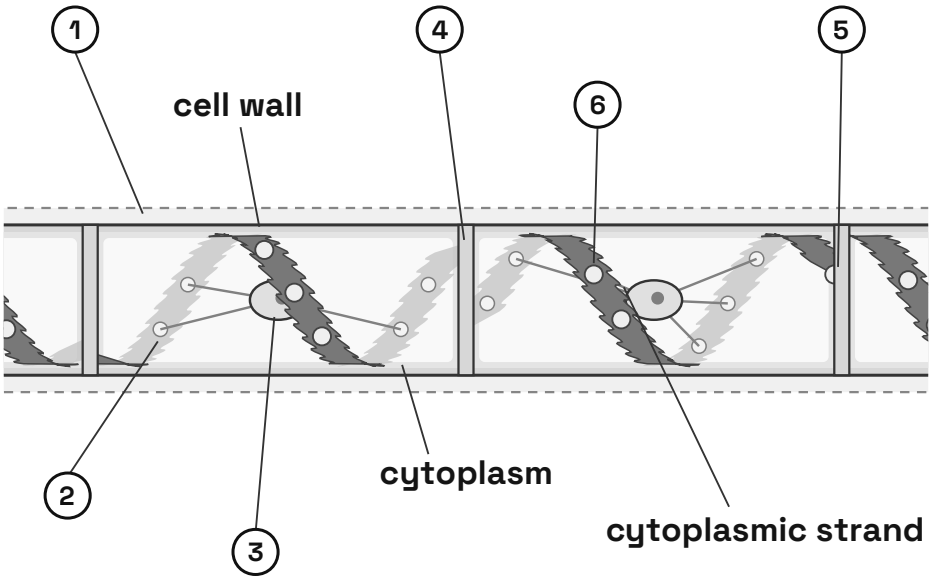
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

ATP	**filament**	**guttation**	**isotonic**	**karyosome**	**osmosis**	**plasmolyzed**	**potometer**
pyrenoids	**scalariform**						

The body of *Spirogyra* is an unbranched _____. Food is gathered as starch round the _____ on its ribbon-shaped chloroplasts. Conjugation between two filaments lying side by side is _____ conjugation. The movement of water through a semipermeable membrane from a less concentrated to a more concentrated solution is _____. A plant cell that has lost water, its protoplast shrunk away from the wall, is _____. A solution with the same concentration as the cell sap is _____. The rate at which a leafy shoot takes up water is measured with a _____. In a cell, energy from food is caught in a molecule called _____.

2 Label the diagram [3]

The diagram shows part of a *Spirogyra* filament. Name the parts numbered 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. Conjugation between two adjacent cells of the same filament of *Spirogyra* is called: [1]

a. scalariform conjugation
b. lateral conjugation
c. fragmentation
d. binary fission

ii. The infective stage of *Entamoeba histolytica* is the: [1]

a. trophozoite
b. precystic form
c. uninucleate cyst
d. tetranucleate (four-nucleate) cyst

iii. A red blood cell placed in distilled water: [1]

a. shrinks
b. stays the same
c. swells and bursts
d. becomes plasmolyzed

iv. Which of these shows that osmosis needs living cells? [1]

a. a raw potato osmometer
b. a boiled potato osmometer used as a control
c. a bell jar over a plant
d. cobalt chloride paper

v. The end products of aerobic respiration are: [1]

a. glucose and oxygen
b. ethanol and carbon dioxide
c. lactic acid and water
d. carbon dioxide and water

4 Very short answers [4]

Write very short answers to the following questions.

a. How many new filaments does one zygospore of *Spirogyra* give? [1]

b. Name the only form of *Entamoeba histolytica* that infects a person. [1]

c. What does a blue cobalt chloride paper turning pink show? [1]

d. In which part of the cell does glycolysis take place? [1]

5 Short answers [10]

Write short answers to the following questions.

a. Conjugation in *Spirogyra* is called physiological anisogamy. [2]

b. The pot and soil are covered with polythene in the bell jar experiment on transpiration. [2]

c. Why is a healthy-looking carrier of *Entamoeba histolytica* a greater source of new infections than a person ill with dysentery? [2]

d. Write any two differences between osmosis and diffusion. [2]

e. A red blood cell bursts in pure water, but a plant cell doesn't. Give the reason. [2]

6 Long answers [8]

Write long answers to the following questions.

a. Describe how *Spirogyra* forms a zygospore in scalariform conjugation and how the zygospore germinates. [4]

b. Name the three stages of aerobic respiration. Write where each happens and what it produces, and write the overall equation. [4]

7 Numerical problems [9]

Solve the following problems. Show your working.

a. A potato strip weighing 3.20 g is left in a sugar solution for an hour and then weighs 2.88 g. Find the percentage change in its mass. Was the solution hypotonic, isotonic or hypertonic to the potato cells? [2]

Answer:

b. In a potometer the air bubble moves 60 mm in 5 minutes along a tube whose cross-sectional area is 1.0 mm^2. When a fan blows on the shoot, it moves 60 mm in 3 minutes. Find the rate of water uptake in each case, and explain the difference. **[3]**

Answer: _____

c. One mole of glucose (180 g) gives about 2,870 kJ in aerobic respiration, and one mole of ATP stores 30.5 kJ. a. How much energy is stored in ATP from 360 g of glucose, at 38 ATP per glucose? b. How many moles of ATP would 360 g of glucose give in anaerobic respiration? **[4]**

Answer: _____

8 Think **[3]**

After a sprint, a runner goes on breathing hard for several minutes, though she is now standing still. Explain why.

9 Activity: Potato strips in sugar solutions (not marked)

Weigh five potato strips and leave one in each solution for an hour. Dry their surfaces, weigh them again, and fill in the table. Then say which solution is closest to isotonic with the cell sap.

Sugar solution	Mass at start (g)	Mass after an hour (g)	Change (%)
water			
weak			
medium			
strong			
very strong			