
BIOLOGY VCE UNITS 1&2 DIAGNOSTIC TOPIC TESTS 2016

TEST 1: CELL SIZE, STRUCTURE AND FUNCTION, AND CROSSING THE PLASMA MEMBRANE

TOTAL 40 MARKS (45 MINUTES)

Student's Name: _____ Teacher's Name: _____

Directions to students

Write your name and your teacher's name in the spaces provided above.
Answer all questions in the spaces provided.

SECTION A: MULTIPLE-CHOICE QUESTIONS

Instructions for Section A

For each question in Section A, choose the response that is correct and circle your choice.
Choose the response that is **correct** or **best answers** the question.
A correct answer scores 1, an incorrect answer scores 0.
Marks will **not** be deducted for incorrect answers.
No marks will be given if more than one answer is completed for any question.

Question 1

The basic unit of life is

- A. the organism.
- B. an organelle.
- C. the cell.
- D. a prokaryote.

Question 2

Ribosomes are

- A. identifiable under a light microscope.
- B. found in both prokaryotic and eukaryotic cells.
- C. membrane-bound.
- D. the site of photosynthesis.

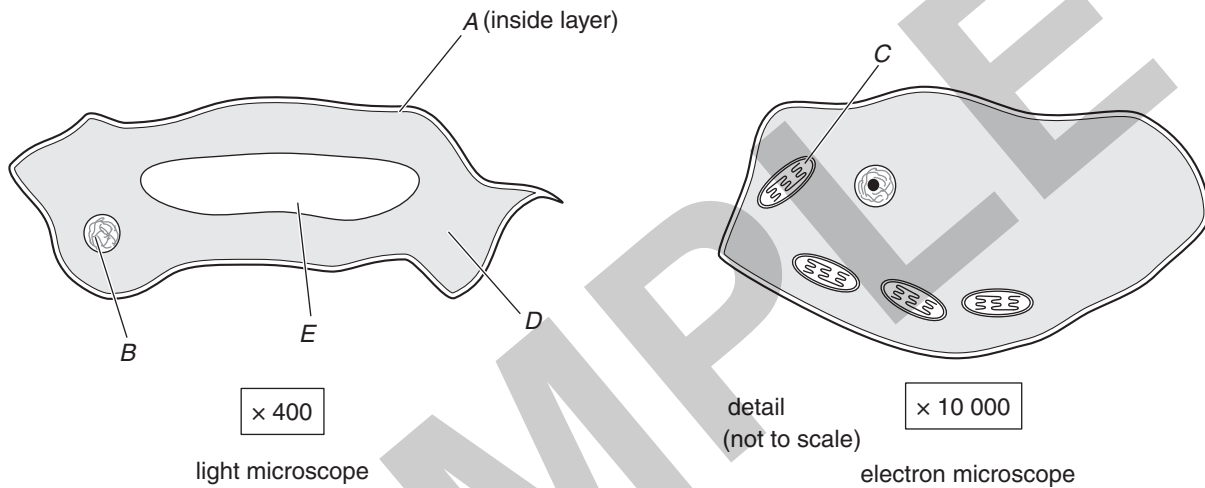
SECTION B: SHORT-ANSWER QUESTIONS

Instructions for Section B

Answer this section in pen.
 Answer **all** questions in the spaces provided.

Question 1 (11 marks)

The cells illustrated below are from different parts of the same organism. The cells are viewed – one with a light microscope, the other with an electron microscope.



a. What are two ways a clearer image can be gained when using a light microscope? 2 marks

b. i. What is an advantage of using an electron microscope? 1 mark

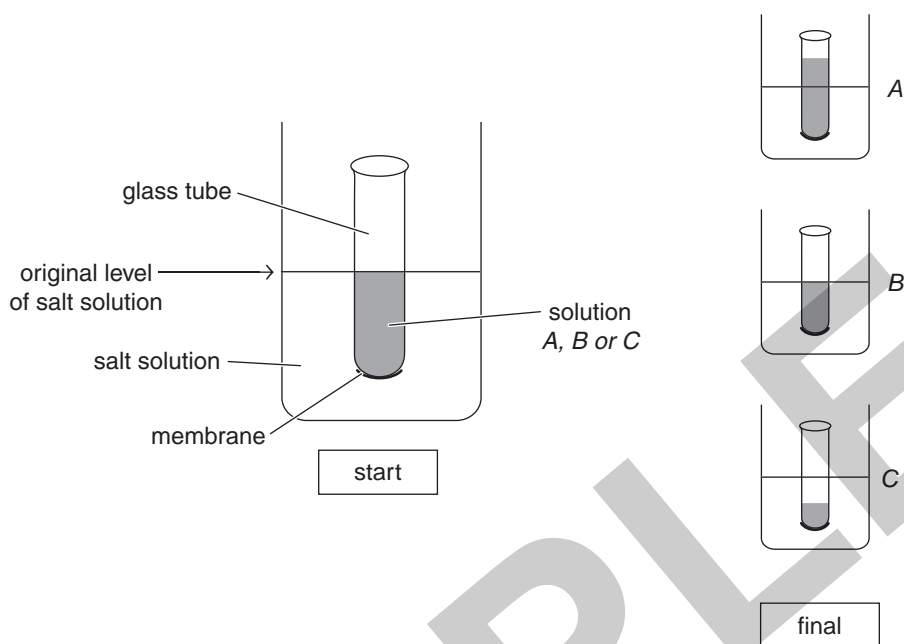
ii. What is a disadvantage of using an electron microscope? 1 mark

c. Give two features which would be used to identify the above cells as plant cells. 2 marks

d. Complete the table below. 5 marks

Structure	Name	Function
A		semipermeable barrier
B	nucleus	
C		
D		site of chemical reactions
E		maintains turgor of cell

Question 4 (9 marks)



Three tubes with three different solutions (*A*, *B*, *C*) were set up as shown above on the left of the diagram. The results after two hours are displayed to the right of the diagram. The membrane is permeable to water but not salt.

- a. What biological term describes the membrane? 1 mark

- b. By what process does water move through the membrane? 1 mark

- c. Which solution, *A*, *B* or *C*, has the highest salt concentration? Explain your answer. 2 marks

- d. Define 'diffusion'. 2 marks

- e. In which solutions does water move? 1 mark

- f. Could active transport occur in the above situation? Explain. 2 marks

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TEST 1: CELL SIZE, STRUCTURE AND FUNCTION, AND CROSSING THE PLASMA MEMBRANE

SUGGESTED SOLUTIONS AND MARKING SCHEME

SECTION A: MULTIPLE-CHOICE QUESTIONS

Question 1 **C**

Organelles are parts of cells which have specific functions. Organisms can be single-celled or multicellular. Prokaryotes are the simplest form of life.

Question 2 **B**

All cell types have ribosomes as the site of protein synthesis. They are not bounded by membranes. In plant cells, photosynthesis occurs in chloroplasts.

Question 3 **A**

V is the nucleus, also present in animal cells. W is the cell wall, X is most likely chloroplasts and Z is a (sap) large, fluid-filled vacuole.

Question 4 **B**

As the cell is magnified $\times 400$, ribosomes would not be visible. As it is a plant cell, the outer barrier would therefore be a cell wall. The cell membrane, whilst present, would not be visible unless the cell is plasmolysed (which it is not, as the sap vacuole is clearly visible).

Question 5 **D**

Shape *T* has been compressed, which greatly increases the surface area.

Question 6 **A**

As shape *S* has the smallest surface area : volume ratio, it would be the most efficient at conserving heat. *T* would gain the most nutrients and have the largest surface area : volume ratio. It would be most suitable for a water lily leaf.

SECTION B: SHORT-ANSWER QUESTIONS

Question 1 (11 marks)

a. *Any two of:*

- staining
- cutting thin slices
- increasing magnification

2 marks

b. i. *Any one of:*

- greater resolution
- greater magnification

1 mark

ii. *Any one of:*

- expensive
- difficult to use
- only black and white images
- specimen must be dead

1 mark

c. *Any two of:*

presence of

- cell wall
- chloroplasts
- large vacuole

2 marks

d.

Structure	Name	Function
A	cell membrane	semipermeable barrier
B	nucleus	controls cellular function
C	chloroplast	site of photosynthesis
D	cytoplasm	site of chemical reactions
E	(sap) vacuole	maintains turgor of cell

5 marks