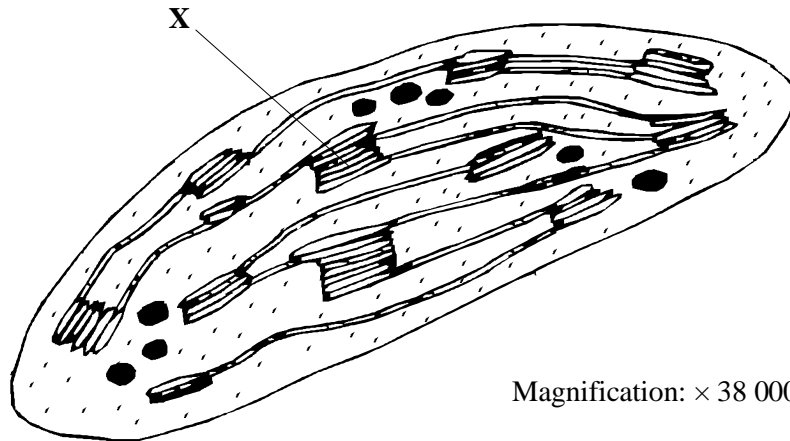


1. The diagram shows an organelle from a palisade mesophyll cell, as seen with an electron microscope.



(a) Name

(i) the organelle;

.....

(ii) the part labelled X.

.....

(2)

(b) Calculate the maximum length of the organelle in micrometres. Show your working.

Length: ..... micrometres ( $\mu\text{m}$ )

(2)

(c) Give **two** ways in which the structure of this organelle is adapted for its function.

1 .....

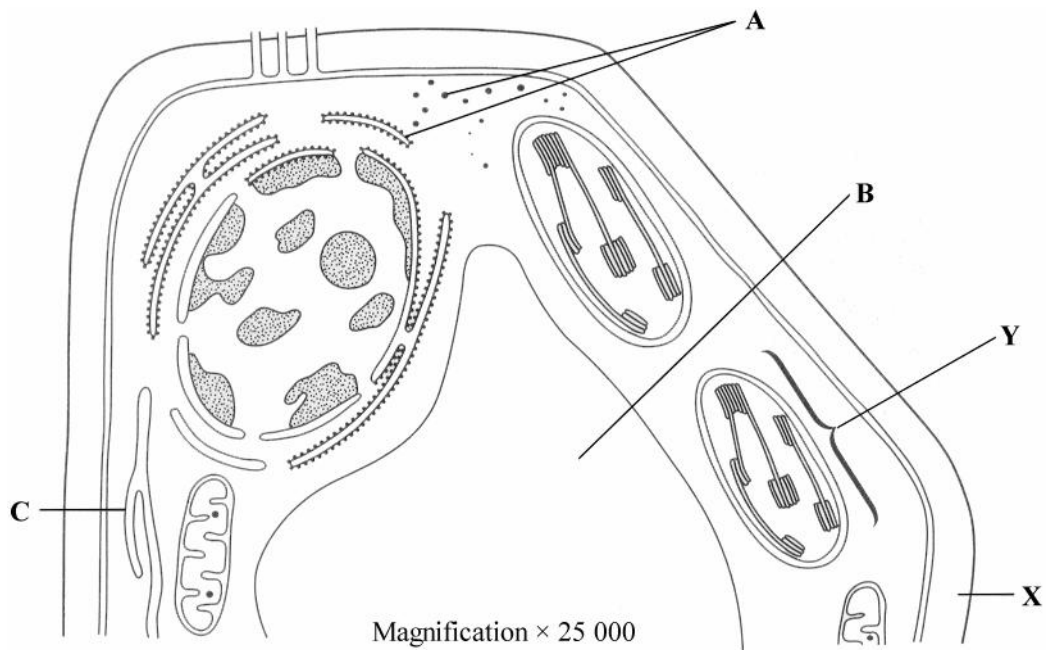
.....

2 .....

.....

(2)  
(Total 6 marks)

2. The diagram shows part of a plant cell as seen through an electron microscope.



(a) Name organelles **A**, **B** and **C**.

**A** .....

**B** .....

**C** .....

(3)

(b) Give the function of

(i) structure **X**;

.....  
.....

(ii) structure **Y**.

.....  
.....

(2)

(c) Calculate the width of the structure labelled **X** in micrometres.  
Show your working.

Width ..... micrometres ( $\mu\text{m}$ )

(2)

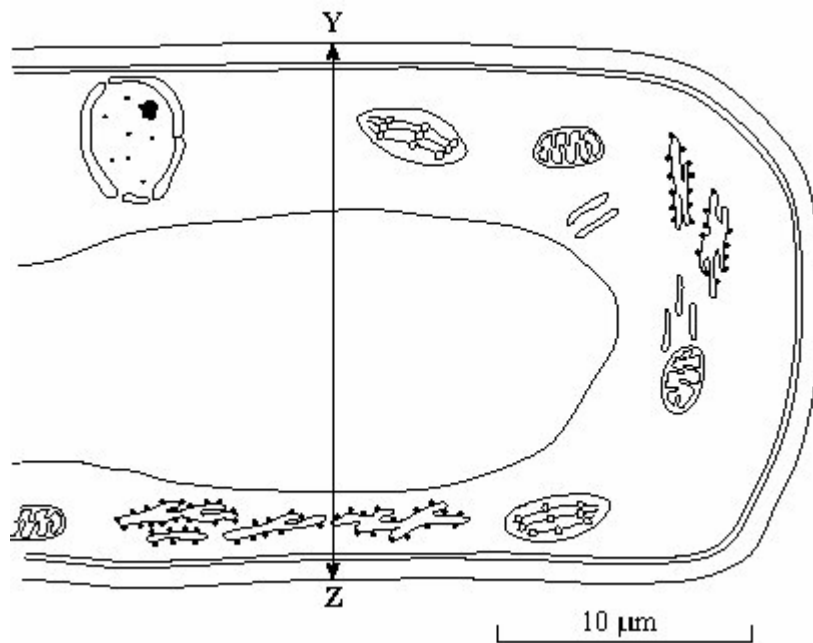
(Total 7 marks)

3. (a) Cells of multicellular organisms may undergo differentiation. What is meant by differentiation?

.....  
.....

(1)

(b) The drawing shows part of a plant cell as seen with an electron microscope.



(i) Give **two** features shown in the drawing which are evidence that this cell is eukaryotic.

- 1 .....
- .....
- 2 .....
- .....

(2)

(ii) Calculate the actual width of the cell from **Y** to **Z**. Give your answer in micrometres ( $\mu\text{m}$ ) and show your working.

Answer .....  $\mu\text{m}$

(2)

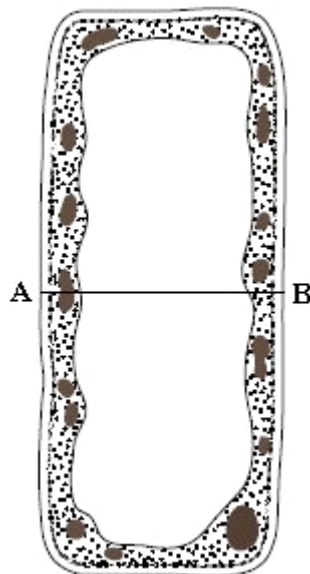
(iii) Give **one** way in which a typical animal cell differs from the cell shown in the drawing.

.....  
.....

(1)  
(Total 6 marks)

4. **Figure 1** shows a section through a palisade cell in a leaf as seen with a light microscope. The palisade has been magnified  $\times 2000$ .

**Figure 1**



(a) Calculate the actual width of the cell, measured from **A** to **B**, in  $\mu\text{m}$ . Show your working

Answer ..... $\mu\text{m}$

(2)

- (b) Palisade cells are the main site of photosynthesis. Explain **one** way in which a palisade cell is adapted for photosynthesis.

.....  
.....  
.....  
.....

(2)  
(Total 4 marks)

5. (a) What is a tissue?

.....  
.....

(1)

- (b) A student cut a thin section of tissue from a potato and examined it with an optical microscope.

- (i) Starch was present in the cells of this tissue. Describe how the student could find out where in the cells the starch was present.

.....  
.....  
.....  
.....  
.....

(2)

(ii) The student cut a thin section of the tissue. Explain why it was important that the section was thin.

.....  
.....  
.....  
.....  
.....

(2)

(c) The cell walls of potato cells contain cellulose. Cellulose and starch are both carbohydrates. Describe **two** ways in which molecules of cellulose are similar to molecules of starch.

.....  
.....  
.....  
.....

(2)

**(Total 7 marks)**