Eukaryotic cell structure

Question Paper

Level	Pre U
Subject	Biology
Exam Board	Cambridge International Examinations
Topic	The Cell
Sub Topic	Eukaryotic cell structure
Booklet	Question Paper

Time Allowed: **24 minutes**

Score: **/20**

Percentage: **/100**

Part - A

1 Fig. 1.1 is a transmission electronmicrograph of a cell.

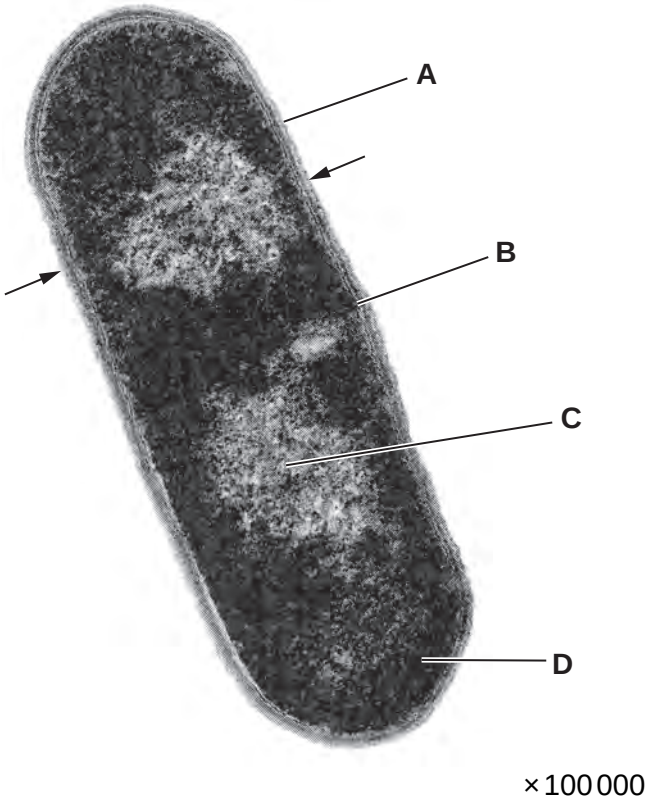

Fig. 1.1

(a) With reference to Fig. 1.1:

(i) identify the type of cell shown;

..... [1]

(ii) name structures **A**, **B** and **C**;

A .....

B .....

C ..... [3]

(iii) name an organelle that would be found in region **D**;

..... [1]

(iv) calculate the actual width of the cell between the arrows. Show your working.

width ..... [2]

(b) Cells like the one shown in Fig. 1.1 turn blue or purple when stained with the Gram stain.

Explain why the Gram staining procedure gives this result with some, but not all, of these types of cells.

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..... [4]

[Total: 11]

Part - B

2 Cell membranes consist mainly of proteins and phospholipids. The arrangement of these molecules in cell membrane structure is described by the fluid mosaic model.

(a) Give **one** example of the function of proteins in membranes.

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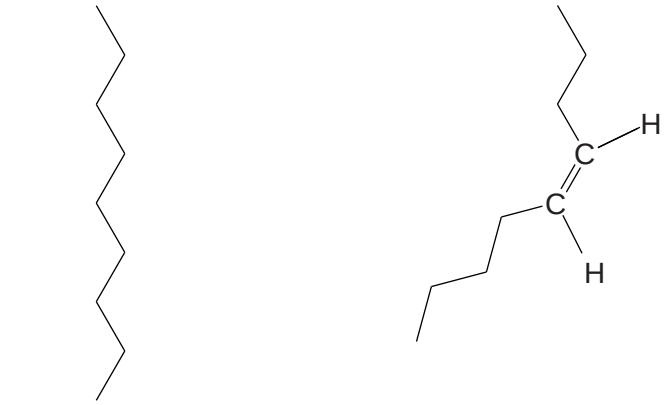
..... [1]

(b) Fatty acid chains of natural membrane phospholipids may be saturated or *Z*-unsaturated. Unsaturated fatty acid chains include one or more double bonds.



saturated fatty acid chain

Z-unsaturated fatty acid chain

Fig. 2.1

(i) Explain why a membrane whose phospholipids contain mainly *Z*-unsaturated fatty acids has a greater fluidity than one whose phospholipids predominantly contain saturated.

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..... [3]

(ii) Explain why the presence of phospholipids with *Z*-unsaturated chains eases the passage of small, non-polar molecules, such as oxygen, through membranes.

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..... [3]

(c) In an experiment, a mouse cell and a human cell were fused. The cell surface membranes of mouse and human cells possess species-specific proteins. The species-specific proteins did not remain at opposite ends of the fused cell, but became intermingled.

Explain what this observation suggests about membrane structure.

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..... [2]

[Total: 9]