Cell Structure

Question Paper 2

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Cell Structure
Sub Topic	Cell Structure
Booklet	Theory
Paper Type	Question Paper 2

Time Allowed : **53 minutes**

Score : **/ 44**

Percentage : **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 All living organisms are divided into five kingdoms.

The table below lists some features possessed by living organisms and some processes that they carry out.

Place a tick or a cross in the table to indicate the presence or absence of the feature or process in any or all members of the kingdom.

The first row has been done for you.

feature or process	kingdom				
	Prokaryotae	Protoctista	Fungi	Plantae	Animalia
80s ribosomes	✗	✓	✓	✓	
cell walls contain chitin					
circular DNA					
endoplasmic reticulum					
most species unicellular					
autotrophic					
heterotrophic					

[6]

[Total: 6]

2 *Vibrio cholerae* is a prokaryotic organism.

Fig. 1.1 shows the structure of a cell of *V. cholerae.*

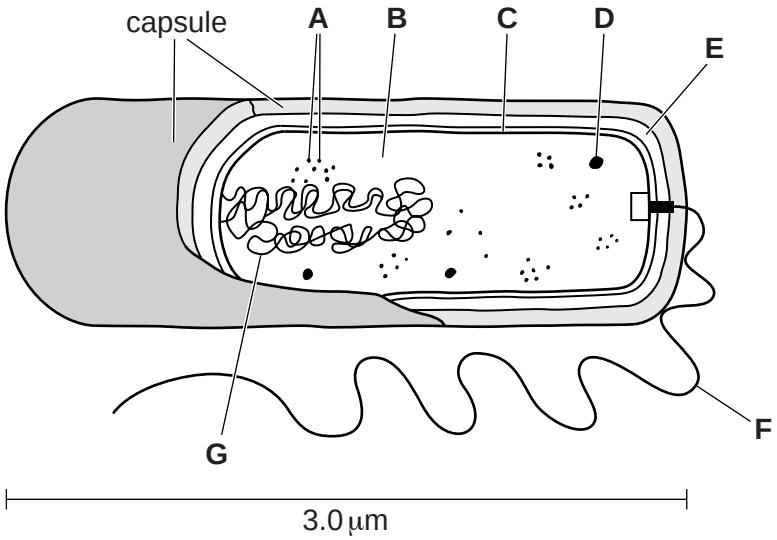

Fig. 1.1

(a) Calculate the magnification of Fig. 1.1.
Show your working and give your answer to the nearest whole number.

magnification × ..... [2]

(b) Locate the structures in Fig. 1.1 that apply to each of the features shown in Table 1.1.
Complete Table 1.1 by writing the appropriate letter and the name of the structure.
You must only give one letter in each case. You may use each letter once, more than once or not at all. The first answer has been completed for you.

Table 1.1

feature	identity	name
provides motility	**F**	flagellum
stores genetic information		
partially permeable		
composed of murein (peptidoglycan)		
site of translation		

[4]

(c) State three **structural** features that are present in a mesophyll cell in a leaf that are **not** present in a prokaryotic cell such as that of *V. cholerae*.

1. .....

2. .....

3. .....

[3]

(d) Describe how *V. cholerae* is transmitted from an infected person to an uninfected person.

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..... [2]

(e) It is important to know how pathogens are transmitted in order to develop effective control methods.

Explain how this knowledge is used to control the spread of *V. cholerae* in the human population.

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..... [3]

[Total: 14]

3 Fig. 2.1 is a transmission electron micrograph of a plasma cell. Plasma cells are antibody-secreting cells that are formed from B-lymphocytes.

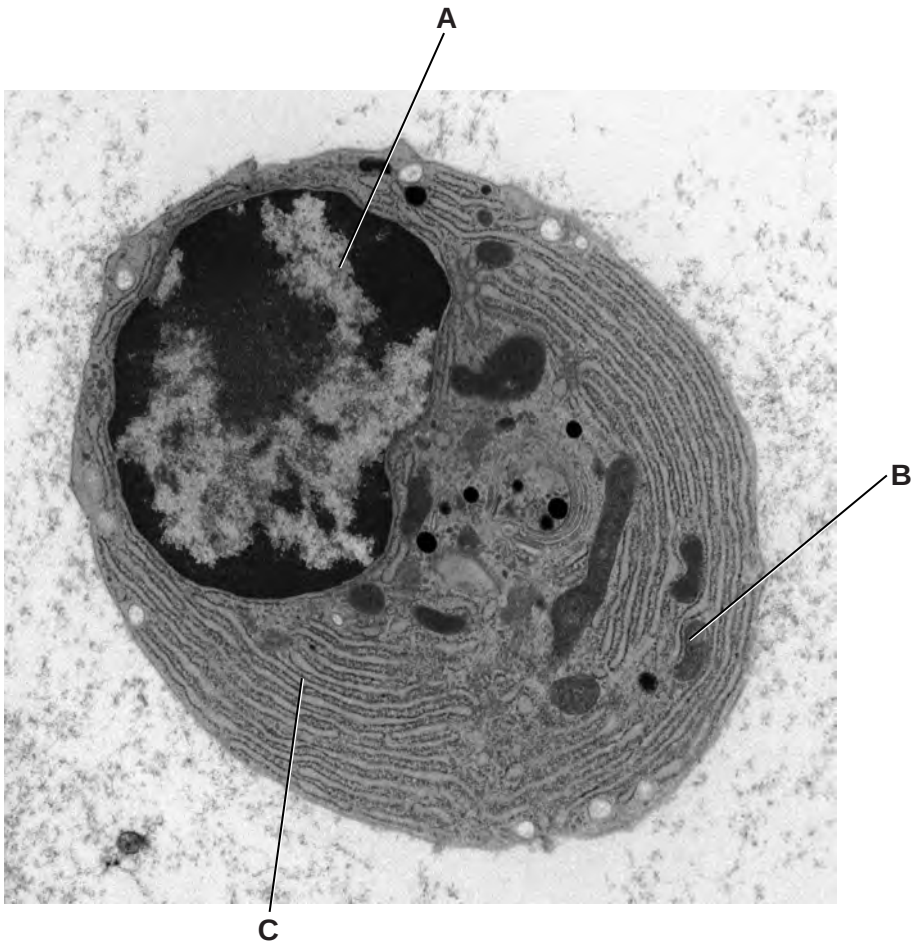

Fig. 2.1

(a) Complete Table 2.1 to:

- name in full, structures **A**, **B** and **C**
- outline how each structure functions to contribute to the **specific role of the plasma cell**.

Table 2.1

structure	name of structure	function of structure within plasma cell
A		
B		
C		

[6]

(b) An activated B-lymphocyte divides repeatedly by mitosis to produce many identical plasma cells.

(i) Explain why it is important that many identical plasma cells are produced.

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..... [3]

(ii) B-lymphocytes have centrioles and a spindle that can be observed during mitosis.

Describe and explain how the behaviour of the centrioles and spindle of a cell dividing by mitosis is associated with the behaviour of the chromosomes.

You may use the space below for labelled diagrams.

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..... [4]

[Total: 13]

4 Fig. 1.1 is an electron micrograph of cells from the lining of the small intestine.

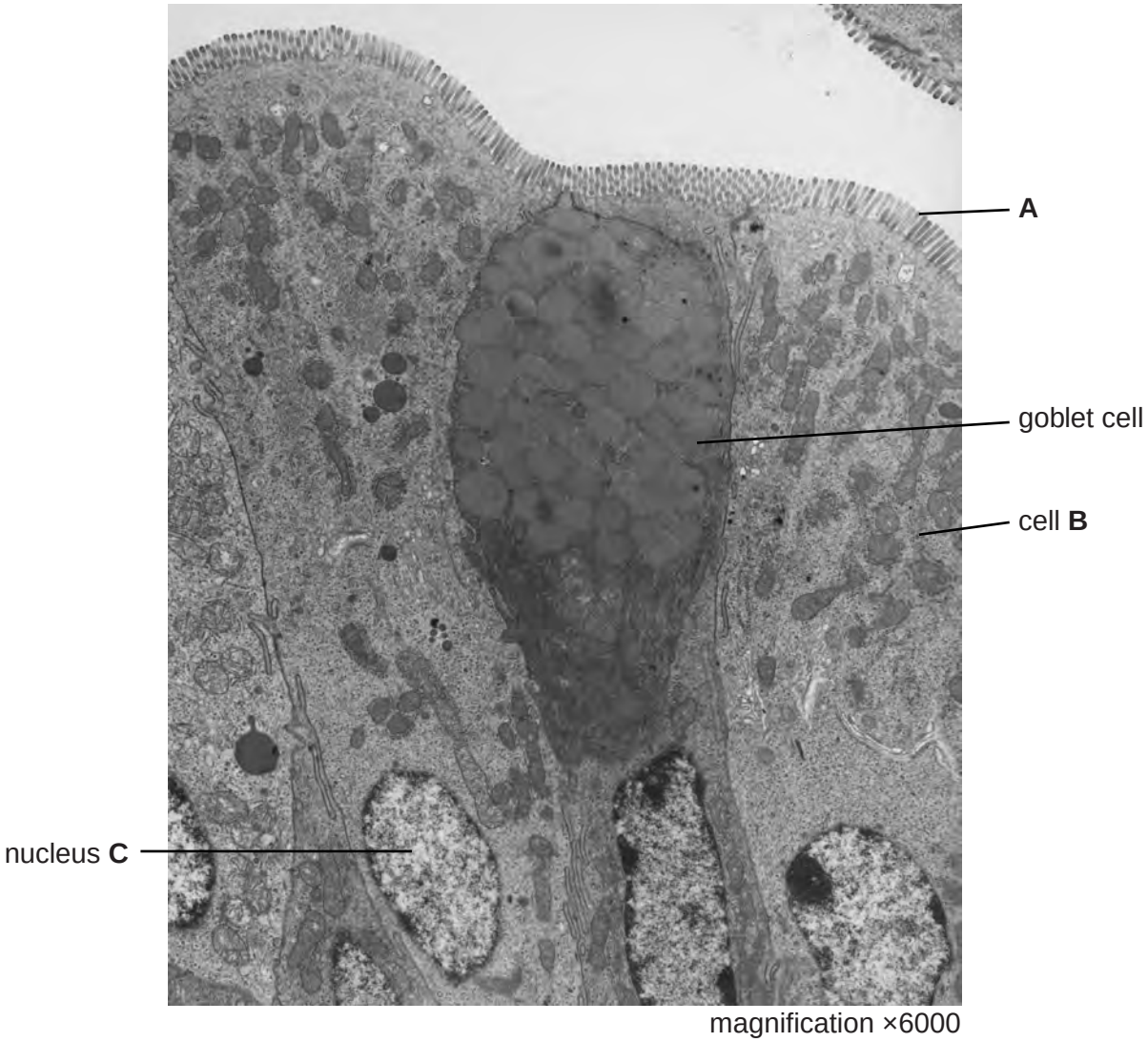

Fig. 1.1

(a) Identify the structures labelled **A** and state their role for the cell.

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..... [2]

(b) There are many mitochondria in cell **B**.

Suggest why cell **B** contains a large number of mitochondria.

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..... [2]

(c) Calculate the actual length of the nucleus **C**.

Show your working and express your answer to the nearest 0.1 micrometre.

answer ..... μm [2]

(d) There are many goblet cells within the epithelium lining the trachea and the bronchi in the gas exchange system.

Describe the role of goblet cells in the gas exchange system.

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..... [3]

(e) State two ways in which the cells lining the alveoli in the lungs differ from cell **B** shown in Fig. 1.1.

1. .....

2. .....

[2]

[Total: 11]