

**ADVANCED SUBSIDIARY GCE
 APPLIED SCIENCE**

Unit 4: Cells and Molecules

FRIDAY 23 MAY 2008

G623

Morning
 Time: 45 minutes

Candidates answer on the question paper
Additional materials (enclosed): None

Additional materials (required):
 Electronic calculator
 Ruler (cm/mm)



Candidate Forename

Candidate Surname

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **45**.
- You are advised to show all the steps in any calculations.
- You will be awarded marks for the quality of written communication where this is indicated in the question.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	7	
2	21	
3	10	
4	7	
TOTAL	45	

This document consists of **8** printed pages.

Answer **all** the questions.

1 A group of students were preparing a presentation on the topic 'Microscopy'.

They included some assessment items. These are found in sections (a) and (b) of this question.

(a) Describe how to produce a temporary slide of plant tissue to show the structure of a plant cell.

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.....[3]

(b) Fig. 1.1 shows illustrations of the same plant cells as seen with a light microscope (photomicrograph), and with an electron microscope (electronmicrograph).

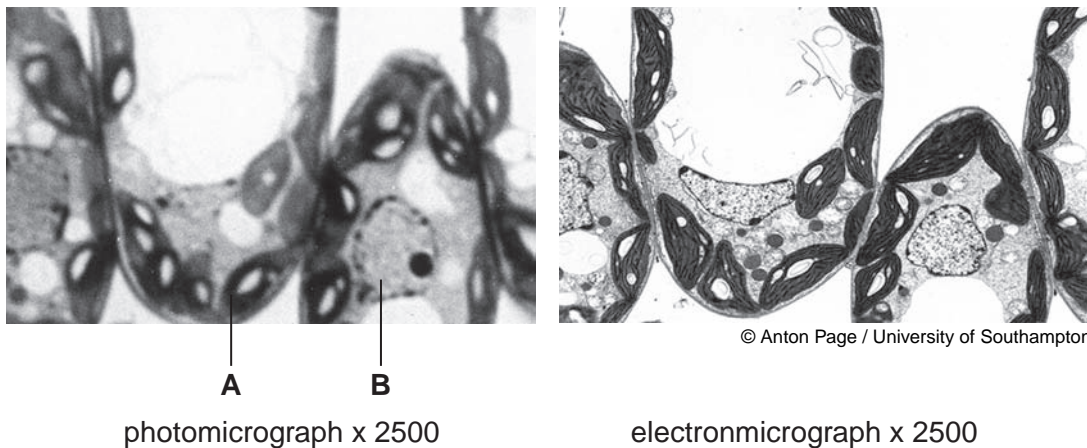


Fig. 1.1

(i) Name the structures labelled **A** and **B**.

A.....

B.....[2]

(ii) Suggest and explain **one** advantage of using the electron microscope to look at structures **A** and **B**.

.....

.....

.....

.....[2]

[Total: 7]

- 2 (a) Each of the features listed in Table 2.1 is associated with one or more of the food chemical groups: carbohydrates, lipids and proteins.

Complete Table 2.1 by placing a tick (✓) in the appropriate box or boxes for each feature.

One has been done for you.

Table 2.1

feature	carbohydrate	lipid	protein
alpha helix			
biuret test			
condensation reaction			
emulsion test		✓	
ester bond			
glycosidic bond			

[5]

- (b) (i) Draw a diagram to show how a mono-glyceride is formed from one molecule of glycerol and one fatty acid molecule.

[2]

- (ii) Explain how saturated and polyunsaturated lipids differ.

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.....

.....[3]

(d) Fig. 2.1 shows the arrangement of molecules in a cell surface membrane according to the fluid mosaic model.

Label **A**, **B**, **C** and **D**.

Choose your answers from the following list.

cholesterol

glycolipid

glycoprotein

phospholipid

protein

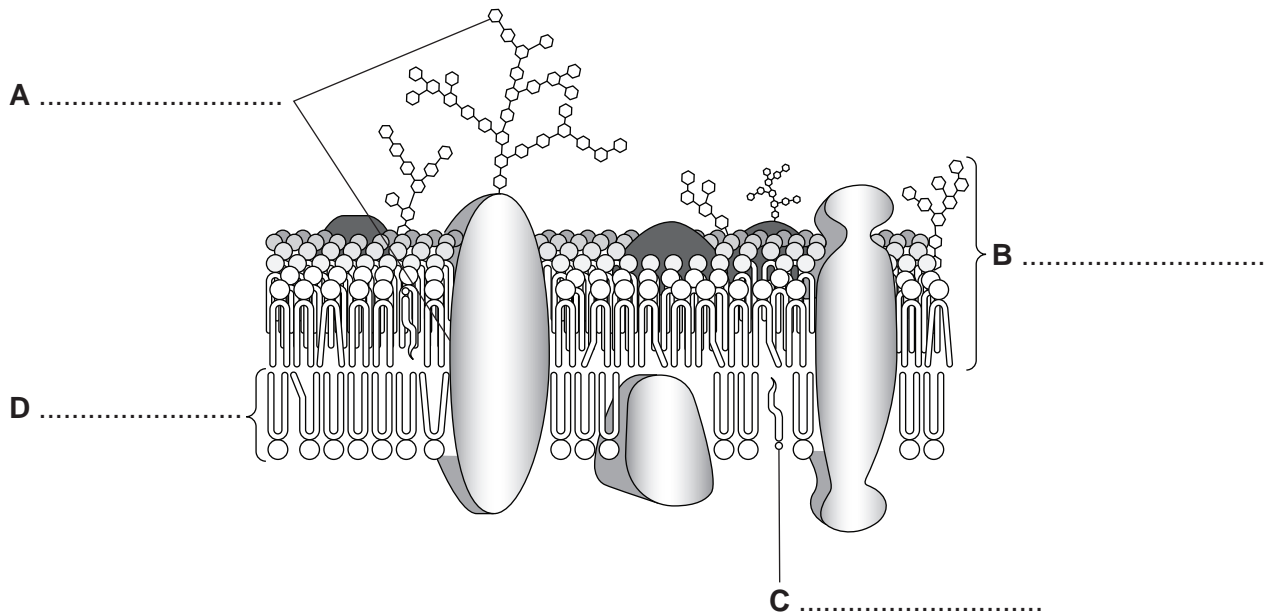


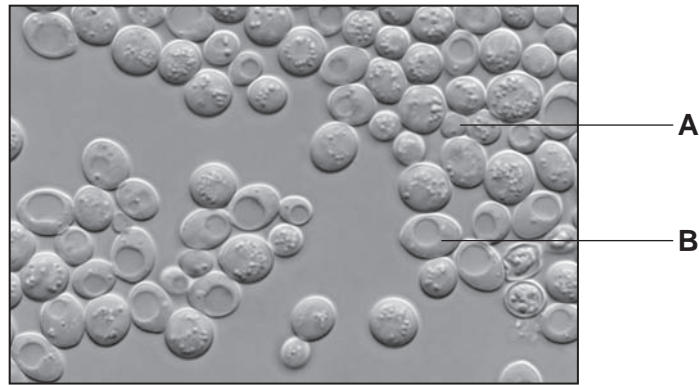
Fig. 2.1

[4]

[Total: 21]

- 3 (a) A student prepared a microscope slide of yeast cells taken from an actively growing culture.

Fig. 3.1 is a photomicrograph of the type of cells that he saw.



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Fig. 3.1

- (i) Describe how an eyepiece graticule could be used to work out the relative maximum diameters of cells **A** and **B**.

.....
.....
.....
.....
.....[2]

- (ii) Explain how a stage micrometer could be used to work out the actual maximum diameters of cells **A** and **B**.

.....
.....
.....
.....
.....[2]

(b) Technicians may have to monitor the growth of yeast populations used in the manufacture of beers or wines. One piece of equipment they use is called a Coulter Counter.

(i) Explain how a Coulter Counter determines the number of yeast cells present in beer or wine.

In this question, two marks are available for appropriate use of English, spelling, punctuation and grammar.

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.....[3]

Quality of Written Communication [2]

(ii) State **one** advantage of using a Coulter Counter, rather than a haemocytometer, to count large numbers of yeast cells.

.....[1]

[Total: 10]

4 Doctors identify diseases by careful consideration of the symptoms that an individual may have.

This question examines three different aspects of diagnosis.

(a) Students were asked to produce a leaflet to describe the clinical symptoms of Huntington's chorea (HC).

Write **two** clinical symptoms which they might include in their leaflet.

- 1.
- 2. [2]

(b) A cervical smear is analysed in a hospital pathology laboratory.

Suggest what the technician will be looking for on the slide.

-
-
-
- [2]

(c) The diagnosis of HC or cervical cancer may raise ethical issues for a doctor.

List **three** problems the doctor may have to address.

- 1.
-
- 2.
-
- 3.
- [3]

[Total: 7]

END OF QUESTION PAPER

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