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Candidate Name _____ Centre Number | | | Candidate

CAMBRIDGE INTERNATIONAL EXAMINATIONS

General Certificate of Education Advanced Subsidiary Level and Advanced Level

BIOLOGY 9700/2

PAPER 2

OCTOBER/NOVEMBER SESSION 2002

1 hour

Candidates answer on the question paper.
No additional materials are required.

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces on the question paper.
All working for numerical answers must be shown.

INFORMATION FOR CANDIDATES

The intended number of marks is given in brackets [ ] at the end of each question or part question.

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
6	
TOTAL	

This question paper consists of 11 printed pages and 1 blank page.

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For Examiner's Use

Answer **all** the questions.

Write your answers in the spaces provided.

1 Fig. 1.1 is a drawing made from an electron micrograph showing a cross-section of an alveolus and two adjacent capillaries.

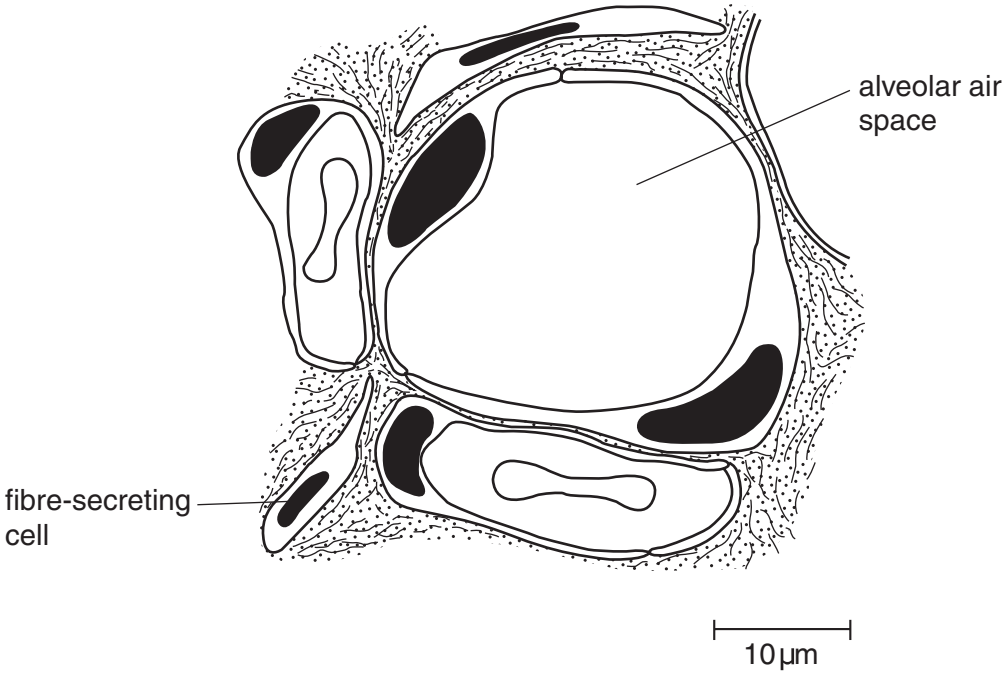


Fig. 1.1

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

.....

.....[2]

(b) With reference to Fig. 1.1, describe the process of gaseous exchange in the alveolus.

.....

.....

.....

.....

.....[4]

Allergies, such as asthma, are the result of an over reaction by the immune system to a harmless antigen. When people suffer from an asthma attack, their immune systems respond to the presence of a specific antigen by producing antibodies. These antibodies attach to the surface of mast cells in the airways causing these cells to release histamine. This hormone-like chemical stimulates inflammation in the lining of the airways, which then makes breathing very difficult.

(c) State the name of the cells of the immune system that secrete antibodies.

.....[1]

(d) Describe the changes that occur in airways, such as the bronchioles, during an asthma attack that make breathing difficult.

.....

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.....[3]

[Total : 10]

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2 Fig. 2.1 shows the reaction to form triglycerides.

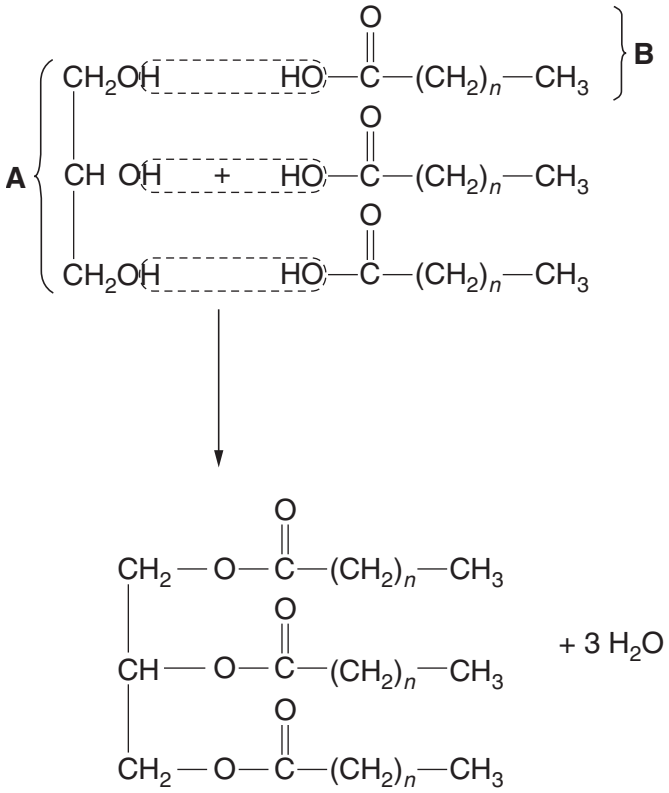


Fig. 2.1

(a) With reference to Fig. 2.1,

(i) name the molecules **A** and **B**;

A .....

B .....[2]

(ii) state the name of the reaction shown.

.....[1]

(b) Animals and plants store triglycerides as energy reserves.

Explain the advantages of storing triglycerides as energy reserves rather than carbohydrates, such as starch.

.....

.....

.....[2]

Overconsumption of fat in the diet may lead to obesity.

(c) State how it is determined whether a person is sufficiently overweight to be classed as obese.

.....

.....

.....[1]

(d) Outline two risks to health of being obese.

1. .....

2. .....[2]

[Total : 8]

For Examiner's Use

3 **(a)** Explain why transpiration is the inevitable consequence of gaseous exchange in land plants.

.....

.....

.....

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.....[3]

Fig. 3.1 shows some of the cells from the lower part and under surface of a leaf. The water potentials of three cells, **A**, **B** and **C**, are shown.

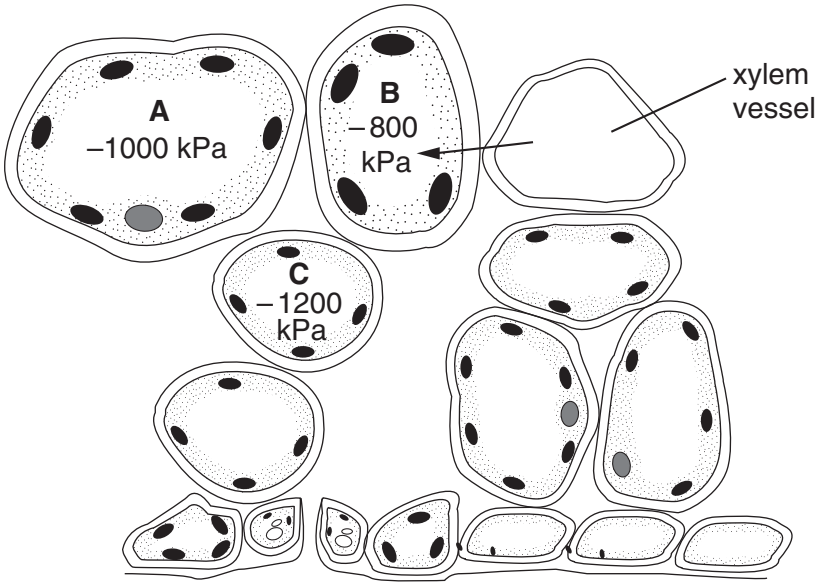


Fig. 3.1

(b) Explain how water moves from the xylem vessel to cell **B**.

.....

.....

.....

.....[3]

(c) Draw labelled arrows on Fig. 3.1 to show the direction in which

(i) water flows between the cells **A**, **B** and **C**; [2]

(ii) water vapour diffuses. [1]

(d) State two features of xerophytic plants that help to reduce the loss of water by transpiration from their leaves.

1. .....

.....

2. .....

.....[2]

[Total : 11]

4 Enzymes are globular proteins that catalyse specific reactions.

(a) Explain how enzymes catalyse specific reactions.

.....

.....

.....

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.....

.....[3]

(b) Restriction enzymes cut DNA into fragments. They cut at specific sites determined by the sequence of bases. Fig. 4.1 shows the base sequences cut by three restriction enzymes and a section of DNA cut by one of these enzymes.

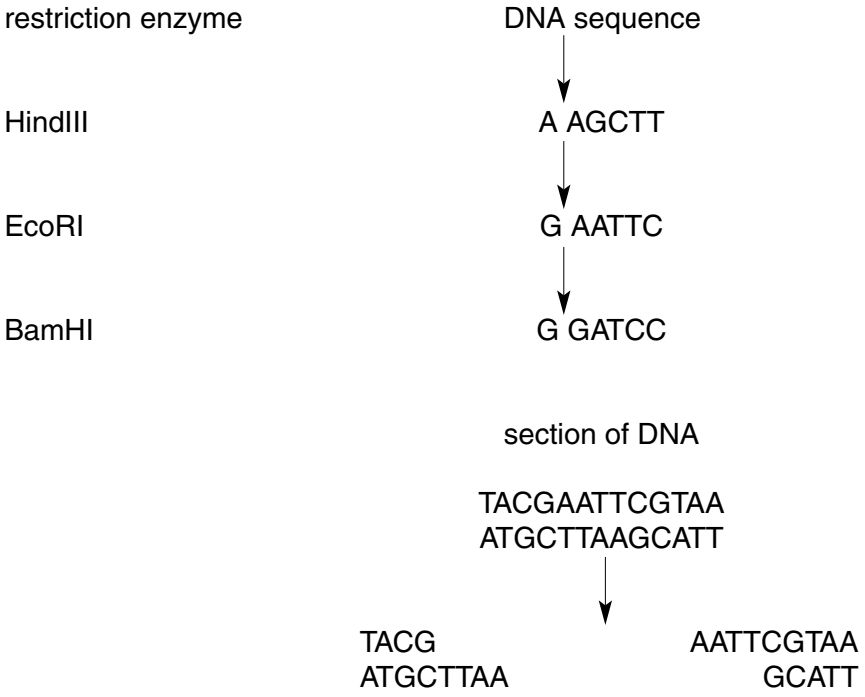


Fig. 4.1

(i) Identify the restriction enzyme that has cut the section of DNA shown in Fig. 4.1.

.....[1]

(ii) State the name given to the unpaired base sequences that remain after DNA has been cut by the three restriction enzymes shown in Fig. 4.1.

.....[1]

(c) Human genes may be cloned by inserting lengths of DNA into bacteria. This may be carried out by inserting the DNA into a plasmid.

Explain how lengths of DNA, cut by restriction enzymes, are inserted into plasmids.

.....

.....

.....

.....

.....

.....[3]

[Total : 8]

[Turn over

For Examiner's Use

5 **(a)** Describe how the malarial parasite is normally transmitted from an infected person to an uninfected person.

.....

.....

.....

.....[2]

Fig. 5.1 is drawn from an electron micrograph of a red blood cell taken from a person suffering from malaria.

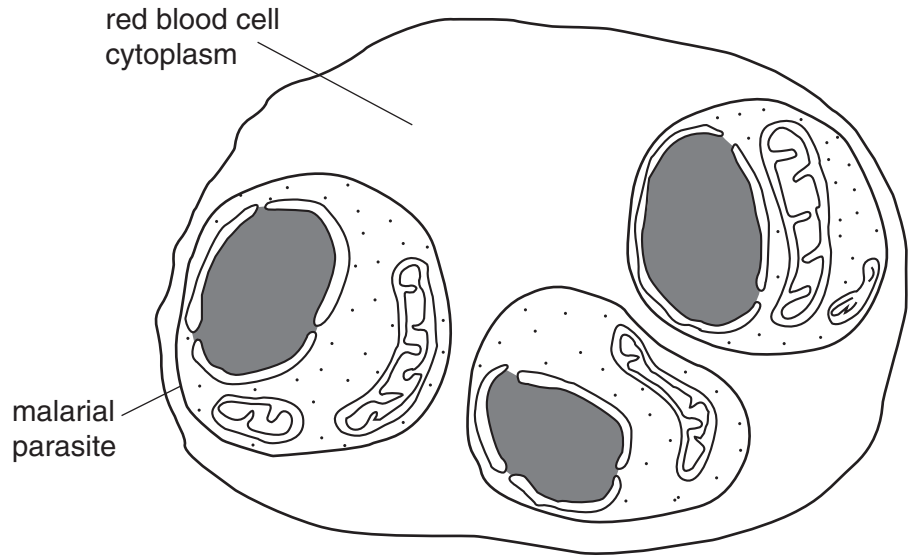


Fig. 5.1

(b) State two features, **visible in Fig. 5.1**, that indicate that the malarial parasite is eukaryotic.

1. .....

2. .....[2]

(c) Outline the likely effects on the body of the presence of malarial parasites in red blood cells.

.....

.....

.....

.....[3]

[Total : 7]

6 Complete the following passage.

During strenuous exercise, muscles often do not receive sufficient oxygen to support aerobic respiration. As a result, muscles carry out ..... respiration and produce ..... , which diffuses into the blood. Most is then absorbed by the ..... , which respires it to form carbon dioxide and water or uses it to form glucose. The volume of oxygen absorbed by the lungs does not return to normal immediately after strenuous exercise because the body has to repay an oxygen ..... .

Exercise that uses the cardiovascular and gaseous exchange systems is termed ..... exercise. Improvements in fitness of the cardiovascular system can be followed by measuring the decrease in the ..... pulse rate. [6]

[Total : 6]

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