

Centre Number	Candidate Number	Name
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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

BIOLOGY**5090/02**

Paper 2 Theory

May/June 2005

Additional Materials: Answer Paper

1 hour 45 minutes**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Sections AAnswer **all** questions.

Write your answers in the spaces provided on the Question Paper.

Section BAnswer **all** the questions including questions 6, 7 and 8 **Either** or **8 Or**.

Write your answers on the separate Answer Paper provided.

At the end of the examination,

1. fasten all your work securely together;
2. write an E (for Either) or an O (for Or) next to the number 8 in the grid below to indicate which question you have answered.

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

You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.

For Examiner's Use	
Section A	
Section B	
6	
7	
8	
Total	

This document consists of **11** printed pages and **1** blank page.

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

- 1 Three different populations in a small lake are linked in a food chain. Fig. 1.1 shows the changes in size of these populations over a period of time.

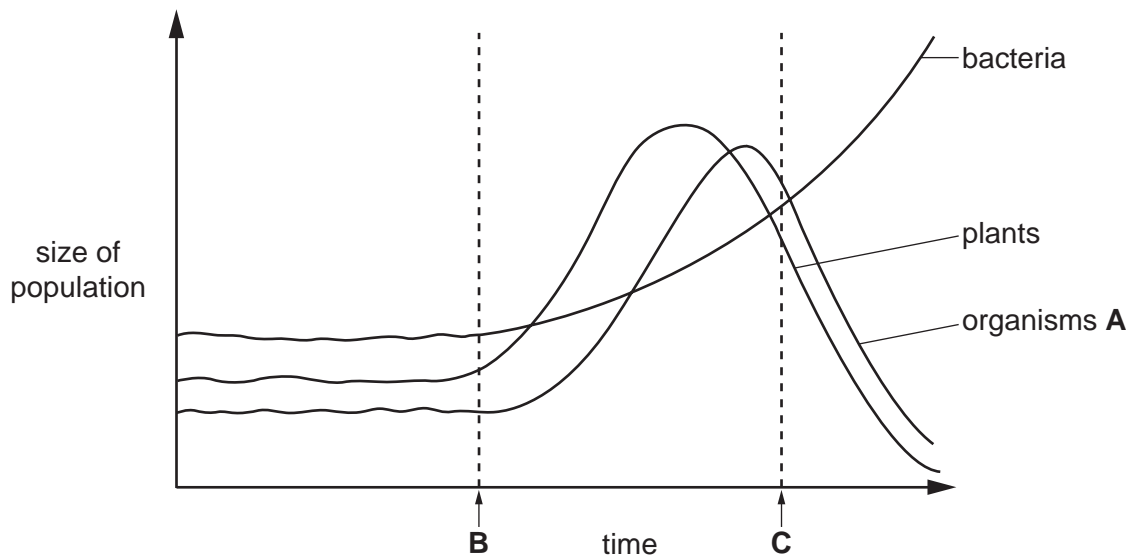


Fig. 1.1

- (a) Using the information in Fig. 1.1,

(i) identify the producer;

.....

(ii) name the trophic level in the food chain of organisms **A**.

.....

[2]

- (b) Suggest what may have entered the lake at time **B** and, by referring **only** to the plant population, explain your answer.

what entered the lake:

explanation

.....

.....[4]

- (c) Explain how the change in the size of the population of bacteria after time **C** is related to the size of the plant population.

.....

.....

.....[2]

- (d) Fig. 1.2 is a graph that shows the amount of oxygen in the same lake before time **B**. Complete the graph to show how the oxygen concentration will change over the same time period shown in Fig. 1.1. [2]

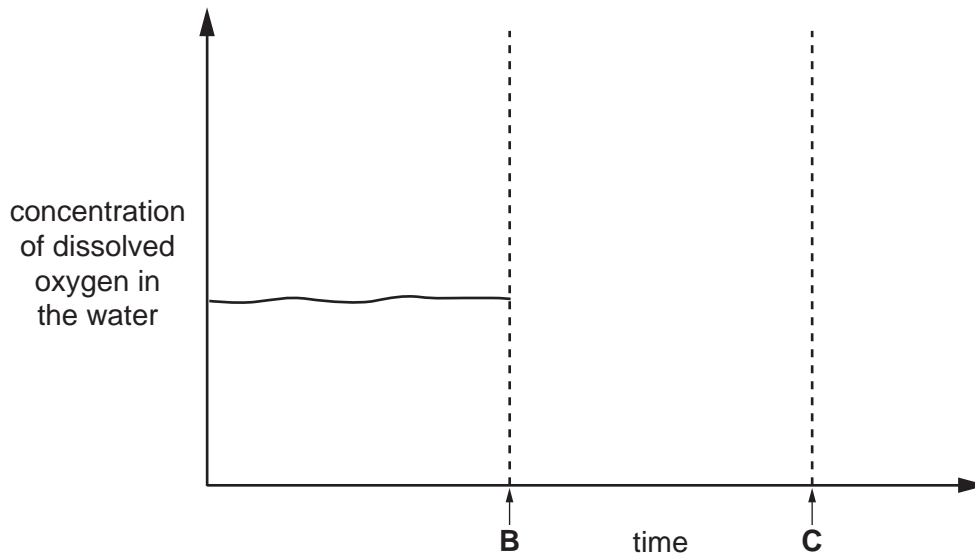


Fig. 1.2

[Total: 10]

2 Fig. 2.1 shows some parts of an insect-pollinated and a wind-pollinated flower.

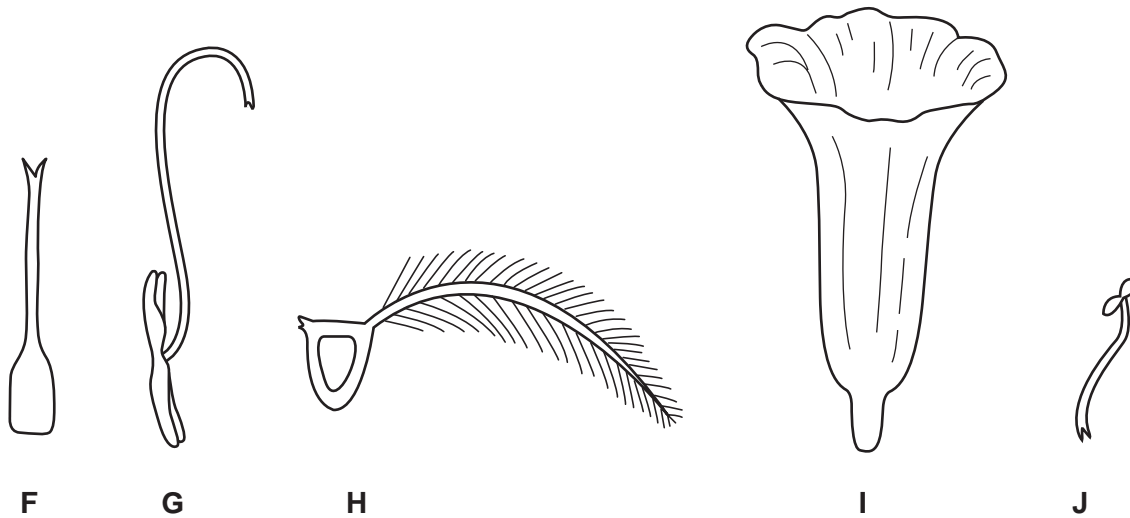


Fig. 2.1

- (a) Using the letters **F**, **G**, **H**, **I** and **J**, list the parts that are from
 the insect-pollinated flower:
 the wind-pollinated flower:
 [2]

(b) (i) In the table below, identify parts **H**, **I** and **J** and state the function of each.

part	name	function
H		
I		
J		

[3]

(ii) Explain how the structure of part **H** helps it to carry out its function.

.....

 [2]

(c) Fig. 2.2 shows a pollen grain with its pollen tube.

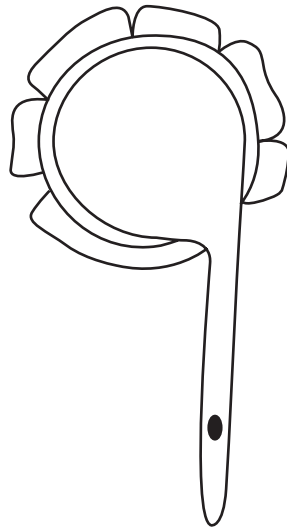


Fig. 2.2

On Fig. 2.1, use a line labelled **L** to show exactly where the pollen grain as shown in Fig. 2.2 is found. [1]

(d) State and explain the difference between a nucleus in a pollen grain and a nucleus found in a cell in structure **I**.

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

[Total: 10]

3 Fig. 3.1 shows a section through a leaf with only some of the cells drawn.

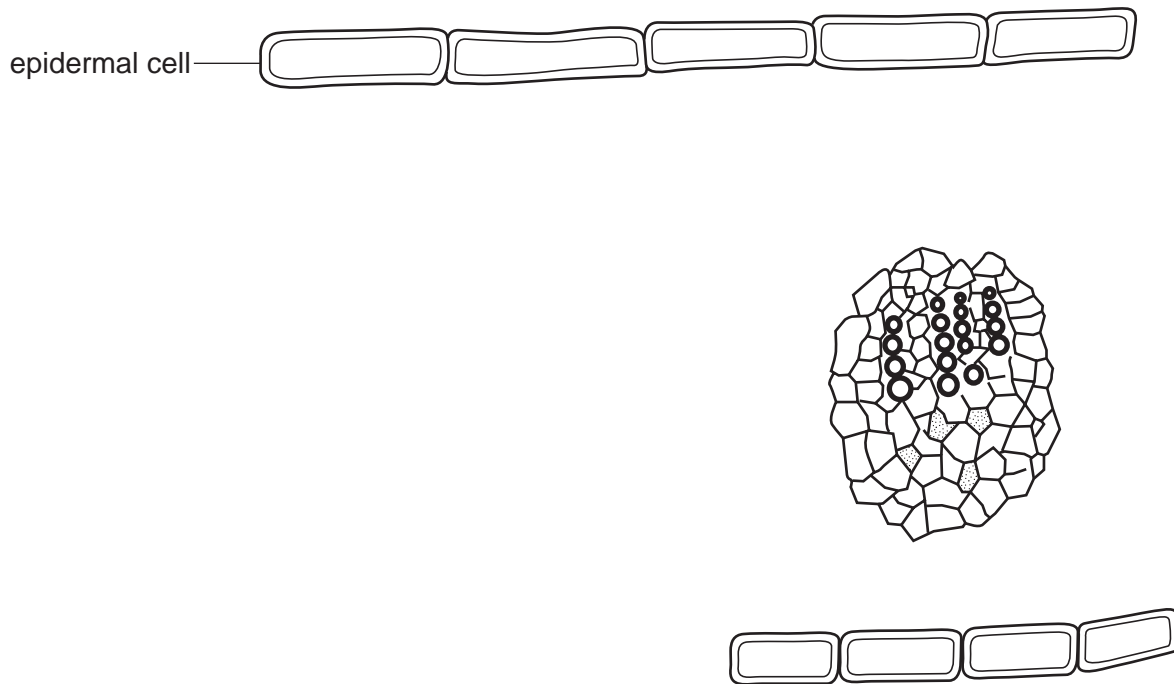


Fig. 3.1

(a) On Fig. 3.1, draw and label in their correct positions:

- (i) a palisade mesophyll cell;
- (ii) a spongy mesophyll cell;
- (iii) a pair of guard cells;
- (iv) a cuticle.

[4]

(b) On Fig. 3.1, label and name the tissue bringing water into the leaf.

[2]

(c) Explain how an increase in atmospheric humidity slows down the process of transpiration.

.....

[3]

(d) Suggest **one** reason why epidermal cells are important to a leaf.

.....
[1]

[Total: 10]

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4 Fig. 4.1 shows a section through a small surface wound to the skin.

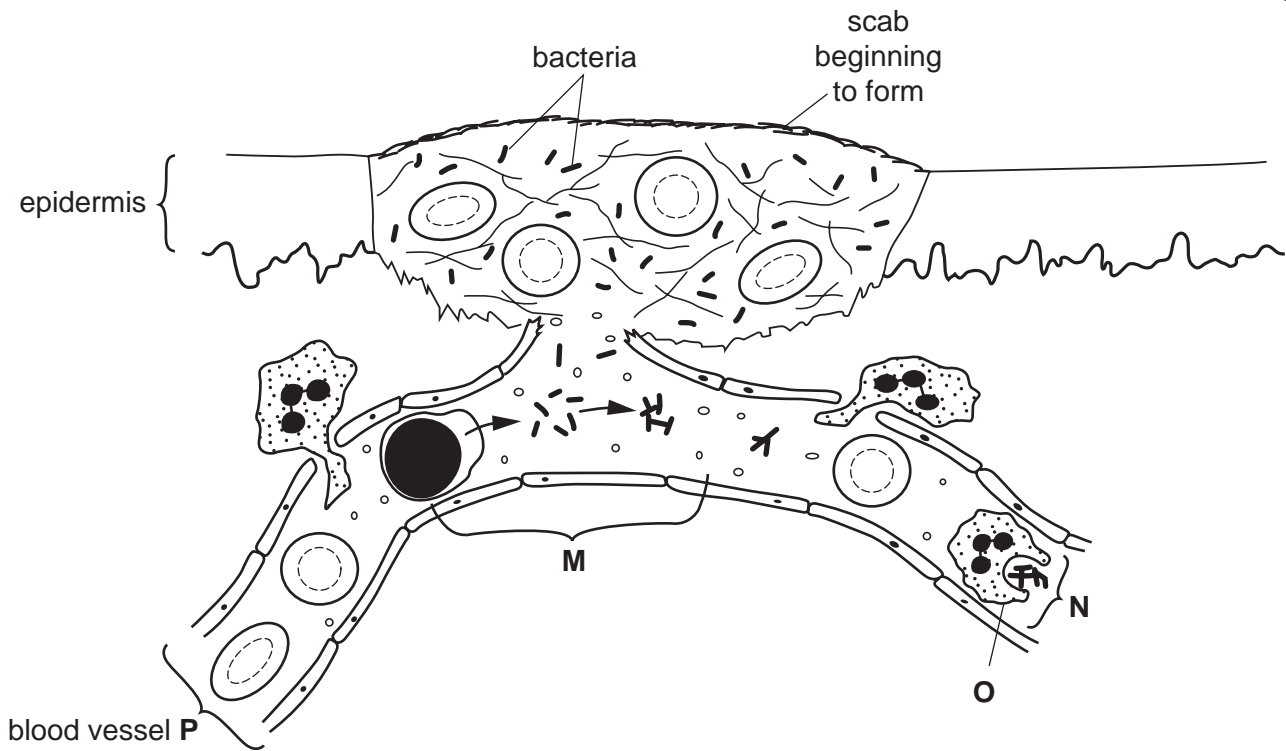


Fig. 4.1

(a) Name structure **O** and the type of blood vessel **P** shown in Fig. 4.1.

O

P [2]

(b) State two features that are characteristic of the type of blood vessel **P**.

1.

2. [2]

(c) Explain what is happening to the bacteria in Fig. 4.1.

(i) at **M**:

.....

..... [2]

(ii) at **N**:

..... [1]

(d) Explain how the wound is being sealed in the region under the scab.

.....

.....

.....

.....

.....

.....[4]

[Total: 11]

- 5 (a) (i) Name the hormone, released after a meal, which controls the level of glucose in the blood.

.....[1]

Fig. 5.1 shows some organs in the body of a woman.

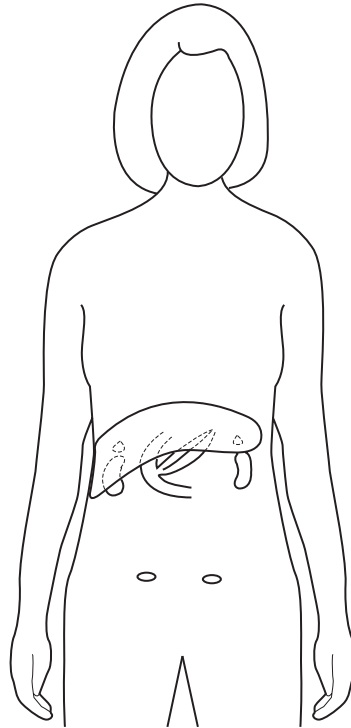


Fig. 5.1

- (ii) On Fig. 5.1, label and name the gland which produces the hormone you mention in (i). [2]
- (iii) Name two other substances produced by this gland.

1.

2.[2]

(b) The hormone in (a)(i) can be manufactured in the laboratory by adding a piece of human DNA to the DNA in a host cell. Fig. 5.2 shows how this is done.

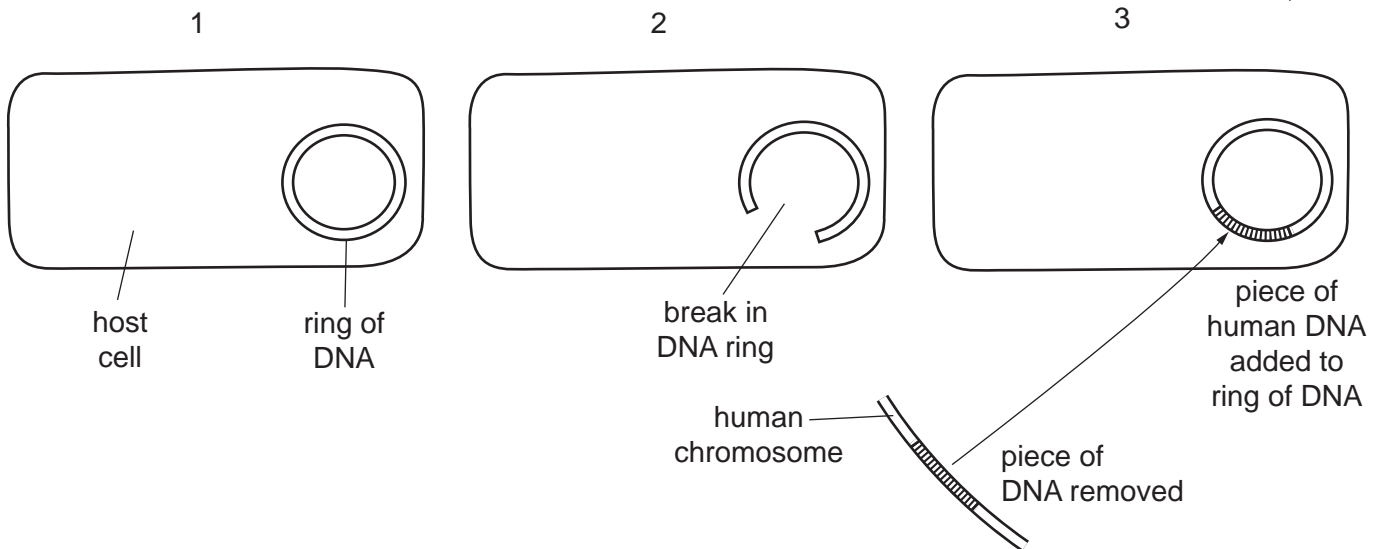


Fig. 5.2

(i) Name the type of host organism used in this process.

.....[1]

(ii) After the process in Fig. 5.2, the host cell will produce the hormone in (a)(i). Describe the piece of human DNA which must be used in this process.

.....

[2]

(c) Suggest what is used to break and rejoin the DNA molecules.

.....[1]

[Total: 9]

Section B

Answer **all** the questions including questions 6, 7 and 8 **Either** or 8 **Or**.

Write your answers on the separate answer paper provided.

- 6 Describe how the following processes differ from each other:
- (a) diffusion and active transport, [3]
- (b) excretion and egestion, [3]
- (c) breathing and respiration. [4]
- [Total: 10]

- 7 (a) Explain how a knowledge of genetics has helped breeders to improve the quality of wool produced by sheep. [6]
- (b) Explain how variation can occur in a natural population of organisms. [4]
- [Total: 10]

Question 8 is in the form of an **Either/Or** question. Answer only question 8 **Either** or question 8 **Or**. Do **not** answer both parts of question 8.

- 8 **Either** (a) Explain what is meant by an enzyme. [3]
- (b) Describe and explain how
- (i) pH and
- (ii) temperature
- affect enzyme activity. [7]
- [Total: 10]

- Or** (a) Describe
- (i) chlorophyll,
- (ii) a chloroplast. [4]
- (b) Describe and explain how
- (i) temperature and
- (ii) light intensity
- affect the rate of photosynthesis. [6]
- [Total: 10]

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