

Candidate Name _____

Centre Number

Candidate
Number

--	--

UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE

**Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level**

BIOLOGY

5090/2

PAPER 2

OCTOBER/NOVEMBER SESSION 2001

1 hour 45 minutes

Additional materials:

Answer paper

TIME 1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer any **three** questions.

Write your answers on the separate answer paper provided.

At the end of the examination,

1. fasten all separate answer paper securely to the question paper;
2. enter the numbers of the Section B questions you have answered in the grid below.

INFORMATION FOR CANDIDATES

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

You are advised to spend about one hour on Section A and 45 minutes on Section B.

FOR EXAMINER'S USE	
Section A	
Section B	
TOTAL	

This question paper consists of 12 printed pages.

Section A

Answer **all** the questions.

Write your answers in the spaces provided.

- 1 Fig. 1.1 shows an experiment set up to investigate any change in the mass of plants potted in damp soil over a period of time.

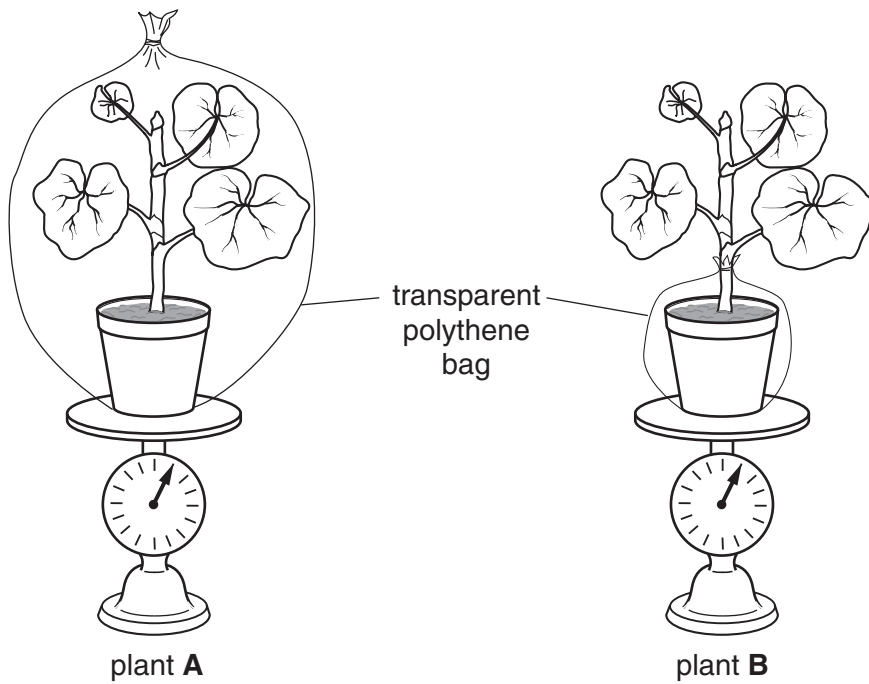


Fig. 1.1

Fig. 1.2 is a graph showing the loss in mass of the plants over the next five days.

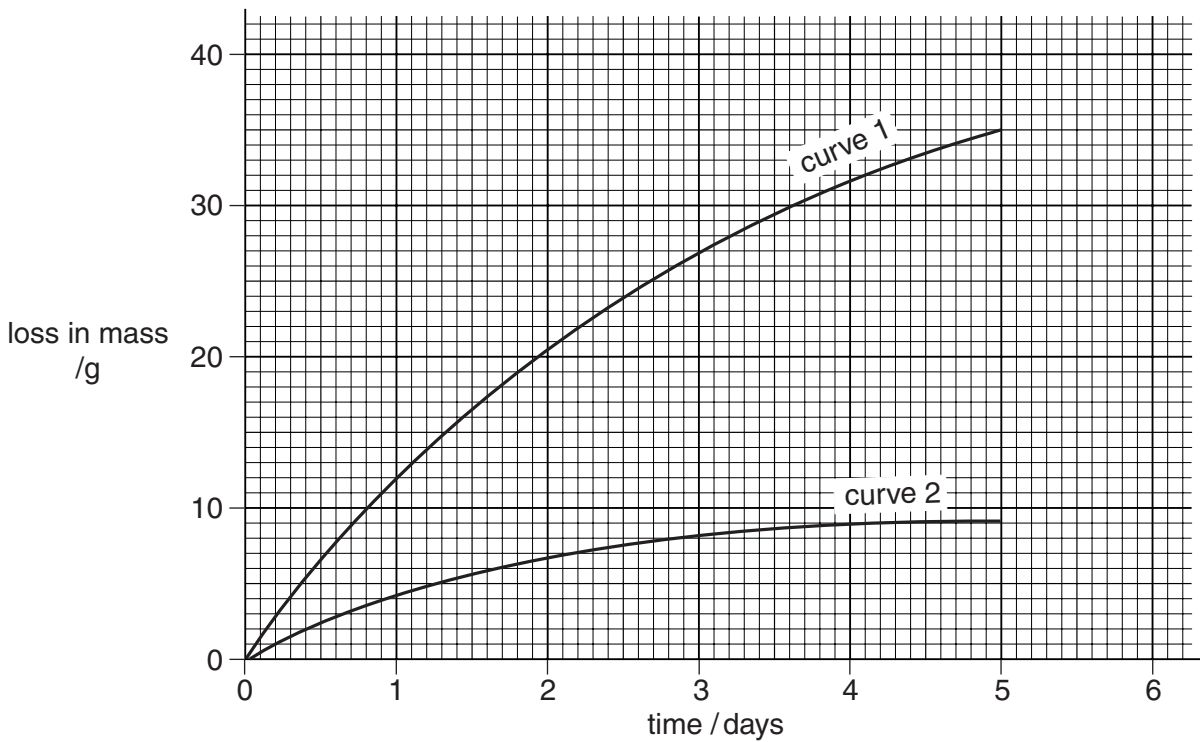


Fig. 1.2

- (a) (i) Which plant gives the result shown by curve 1?[1]
- (ii) On Fig. 1.2, continue curve 1 to day 6 and calculate the mass that would be lost by this plant between day 5 and day 6. Show your working.

[2]

- (b) (i) Name the process responsible for this loss in mass.[1]
- (ii) Explain how this process is affected by the polythene bag around plant **A**.

.....

.....

.....[2]

- (c) Explain the effect on the loss of mass in plant **B** of smearing a thin layer of Vaseline (petroleum jelly) on the **upper** surfaces of all the leaves.

.....

.....

.....[2]

[Total : 8]

[Turn over

2 Fig. 2.1 shows two interlinked natural cycles.

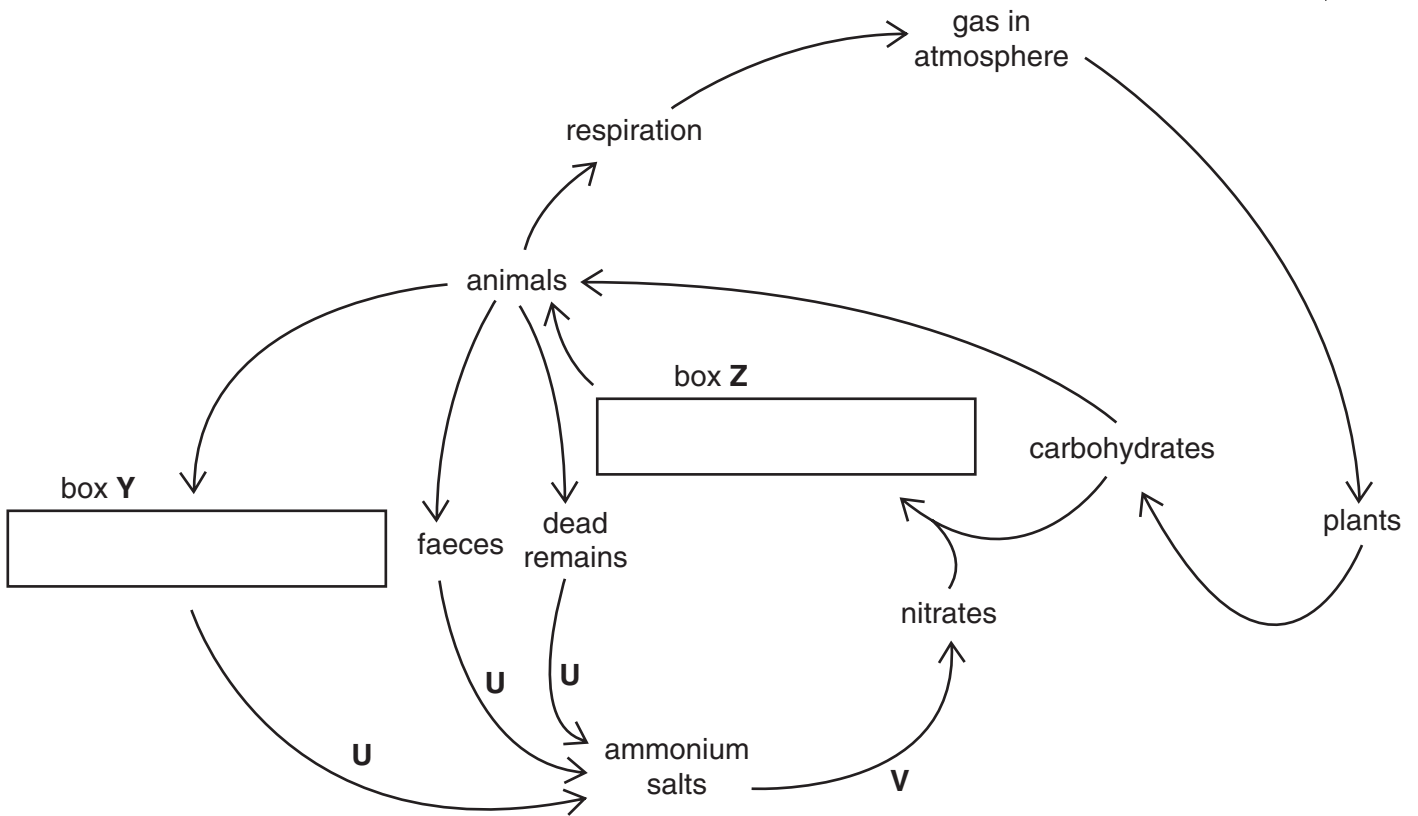


Fig. 2.1

(a) (i) Name the two cycles.

1.[2]
2.[2]

(ii) Name the processes occurring at **U** and **V** and a type of organism that brings about each process.

- process U*
- type of organism*
- process V*
- type of organism*[4]

(b) Complete Fig. 2.1 by filling in boxes **Y** and **Z**. [2]

(c) Suggest how plants that can digest insects grow successfully in soils lacking in nitrates.

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

[Total : 10]

3 Fig. 3.1 shows two different fruits.

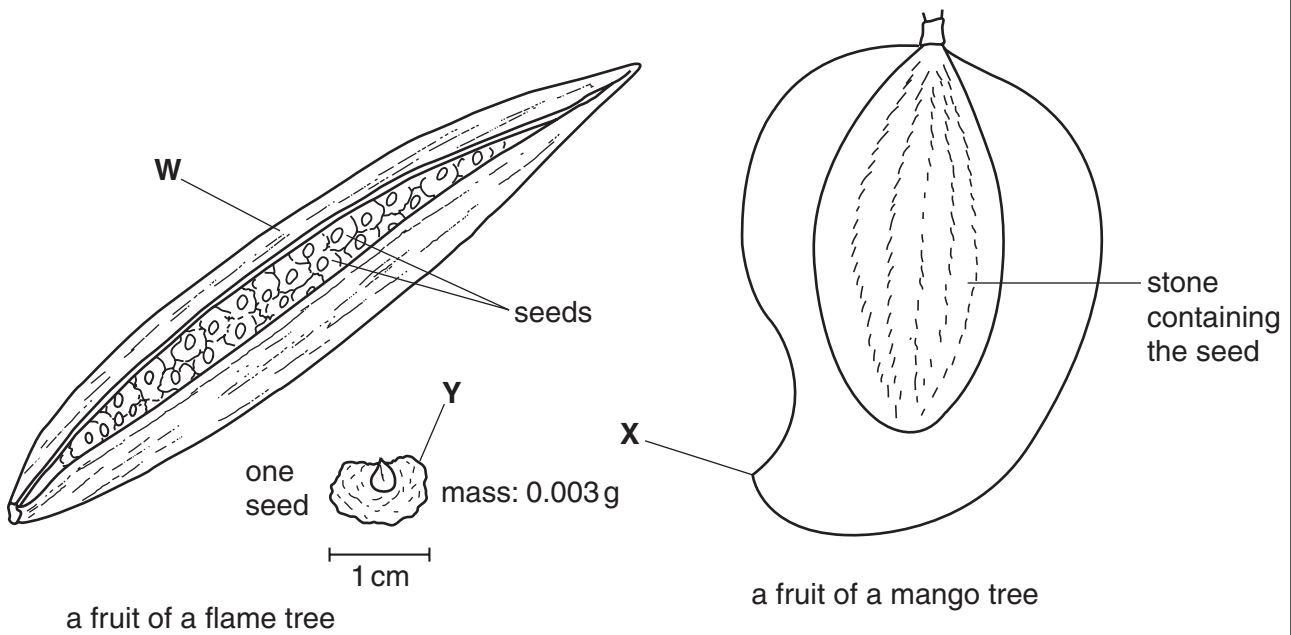


Fig. 3.1

(a) (i) Name the parts of the carpel from which **W** and **X** have developed.

W

X[2]

(ii) From which part of the seed does the dry, papery extension, **Y**, develop?

.....[1]

(b) Suggest how the seeds of the flame tree are dispersed after being released from the fruit. State two reasons for your answer.

method of dispersal

reason 1

reason 2[3]

(c) (i) State which part of the mango tree manufactures the sugar found in the mango fruit.

.....[1]

(ii) Describe how the sugar reaches the fruit.

.....
.....[1]

(iii) Suggest advantages to plants of their fruits being sweet when they are ripe.

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

[Total : 10]

- 4 (a) Fig. 4.1 shows the front view of a person's rib cage.

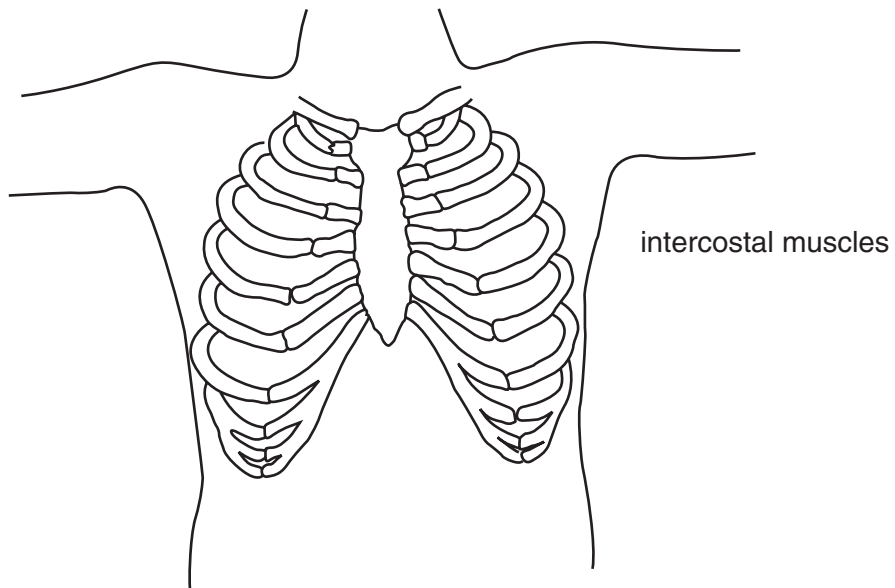


Fig. 4.1

On Fig. 4.1,

- (i) draw a label line to show the position occupied by the intercostal muscles; [1]
- (ii) draw in the diaphragm as it appears after breathing out. [1]

(b) The apparatus shown in Fig. 4.2 can be used to illustrate the action of breathing.

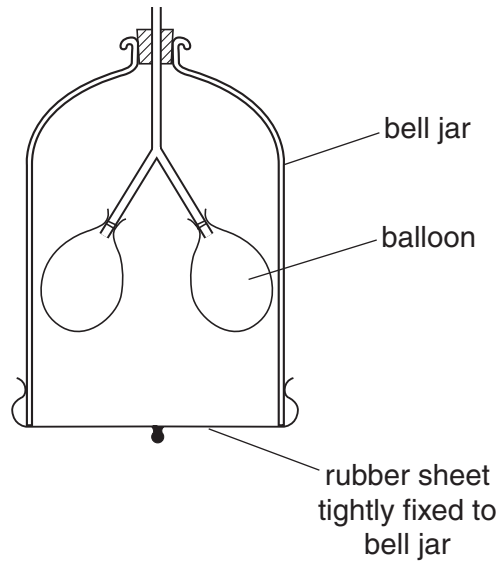


Fig. 4.2

(i) Describe and explain what would happen to the balloons if the rubber sheet is pulled down.

.....

.....

.....[2]

(ii) Suggest how Fig. 4.2 is **not** an accurate model to show the action of breathing.

.....

.....

.....[3]

[Total : 7]

- 5 Fig. 5.1 shows a 'heart-lung' machine being used during an operation on the heart. Fig. 5.2 shows details of the internal structure of the exchanger unit.

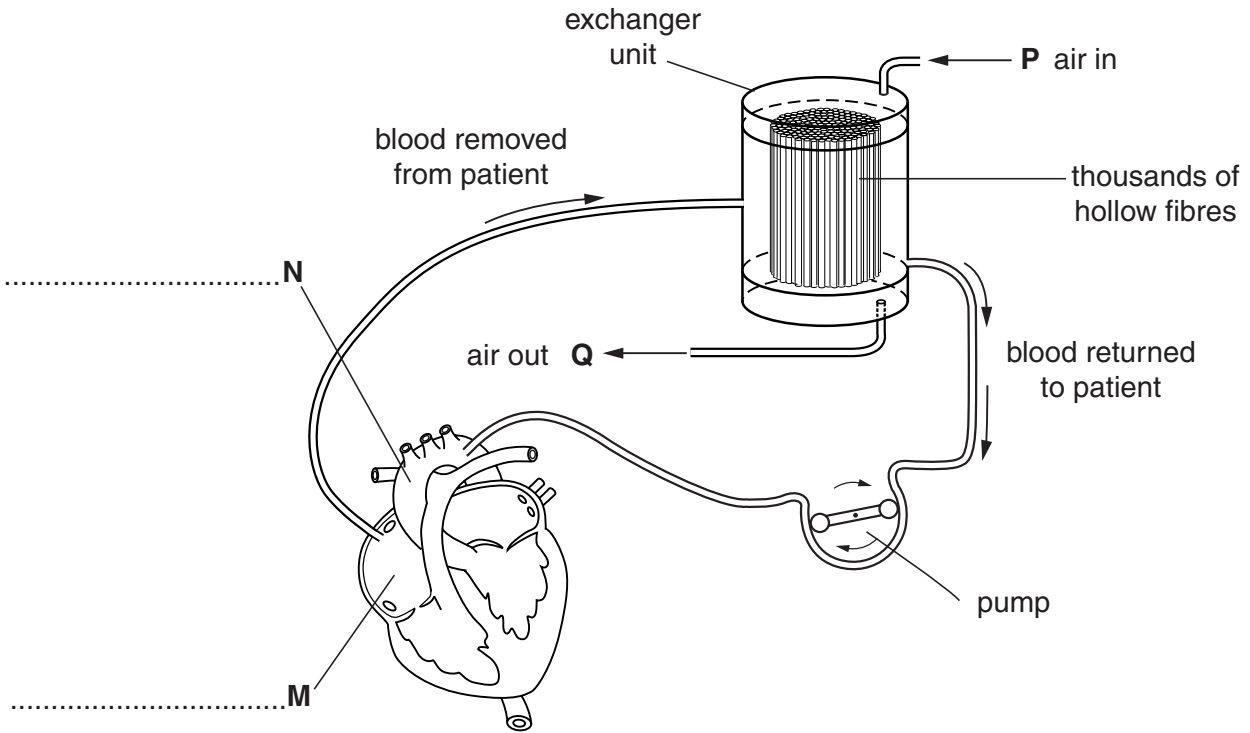


Fig. 5.1

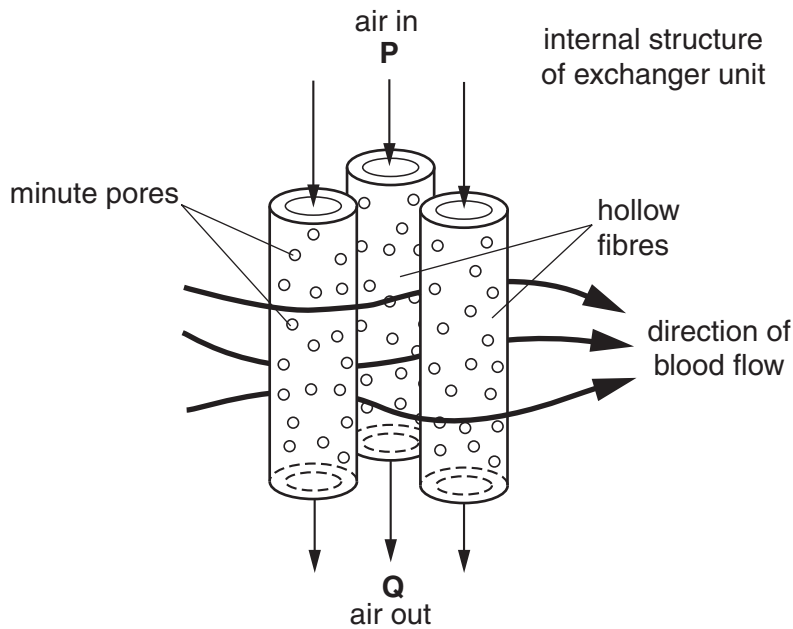


Fig. 5.2

(a) On Fig. 5.1, label structures **M** and **N**. [2]

(b) State two ways in which the air entering the machine at **P** differs from the air leaving it at **Q**.

1.

2. [1]

(c) Which part of the structure of the lungs is represented by the hollow fibres?

.....[1]

(d) With reference to Fig. 5.2, suggest why the pores in the fibres must be

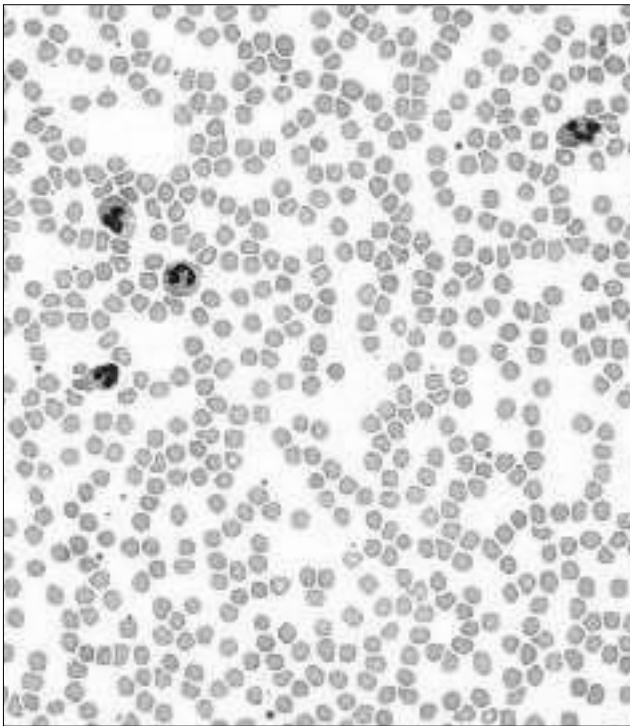
(i) very large in number;

.....[1]

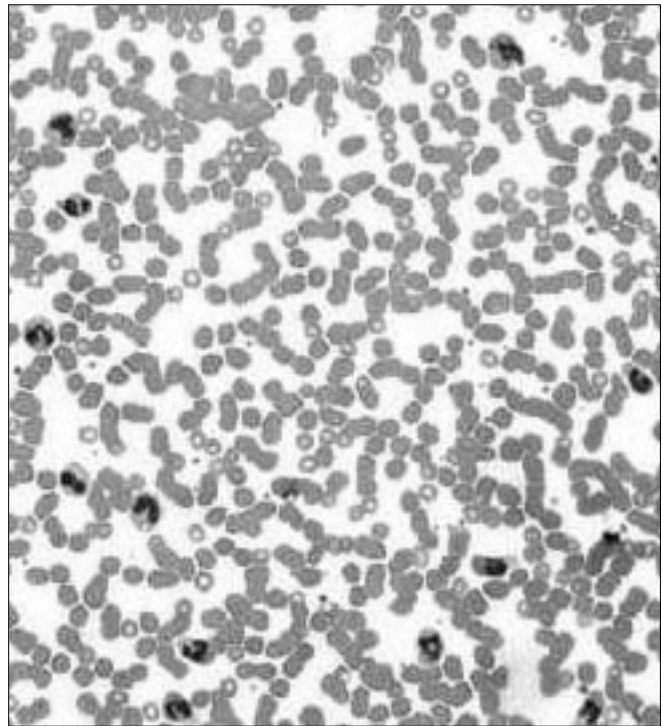
(ii) very small in diameter.

.....[1]

(e) Fig. 5.3 shows micrographs of blood from a healthy person, **A**, and from a patient shortly after heart surgery, **B**.



A



B

Fig. 5.3

(i) Which type of cell has increased in number in **B**?

.....[1]

(ii) State and explain **one** possible cause of this increase after heart surgery.

.....

.....

.....[2]

[Total : 9]

Section B

Answer any **three** questions.

Write your answers on the separate answer paper provided.

- 6 (a) Describe the parts played in the digestion and assimilation of food by
- (i) the pancreas;
 - (ii) the liver.
- [6]
- (b) As a result of intestinal disease, parts of the alimentary canal are sometimes surgically removed. Suggest the effect on lifestyle and on digestive function of removing
- (i) the stomach;
 - (ii) the colon.
- [6]
[Total : 12]
- 7 (a) Explain the effect of a few minutes' vigorous exercise on a person's
- (i) muscles;
 - (ii) pulse rate;
 - (iii) composition of the air they breathe out.
- [10]
- (b) Suggest, with reasons, a suitable diet for an athlete.
- [2]
[Total : 12]
- 8 (a) Describe the process of fertilisation in
- (i) a mammal;
 - (ii) a flowering plant.
- [8]
- (b) Explain why a plant species in which self-pollination usually occurs can become adapted to new surroundings better than one that reproduces asexually, but less well than a species that is always cross-pollinated.
- [4]
[Total : 12]
- 9 (a) Explain
- (i) how a vertical plant shoot grows towards light coming from one side;
 - (ii) how a horizontal plant root responds to gravity.
- [7]
- (b) Describe an experiment to show the response of a **named** invertebrate animal to a **named** stimulus.
- [5]
[Total : 12]
- 10 (a) Explain why water is an essential part of our diet.
- [6]
- (b) Describe, with examples, the transfer of dissolved materials from the blood to the cells of the body.
- [6]
[Total : 12]