Centre Number	Candidate Number

Candidate Name _____

MINISTRY OF EDUCATION, BOTSWANA
in collaboration with
UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE

Botswana General Certificate of Secondary Education

BIOLOGY 0572/3

PAPER 3

OCTOBER/NOVEMBER SESSION 2001 1 hour 15 minutes

Additional materials:
Answer paper

TIME 1 hour 15 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 **both** questions.

Write your answers on the separate answer paper provided.

At the end of the examination, fasten all separate answer paper securely to the question paper.

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 no longer than 30 minutes on Section A.

FOR EXAMINER'S USE	
Section A	
Section B	
7	
8	
TOTAL	

This question paper consists of 8 printed pages.

[Turn over

Section A

Answer **all** the questions.

Write your answers in the spaces provided.

1 Fig. 1.1 shows some parts of an animal cell.

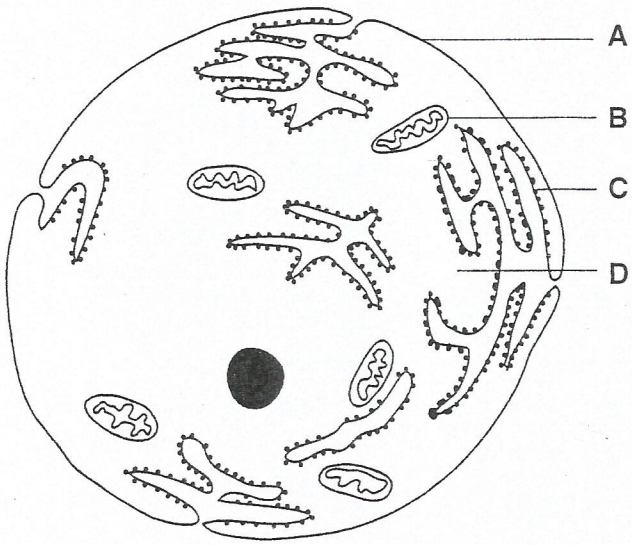

Fig. 1.1

(a) Name structures **A** and **D**.

A .....

D .....[2]

(b) State the functions of structures **B** and **C**.

B .....

.....

C .....

.....[2]

[Total : 4]

2 Fig. 2.1 shows the four main blood groups.

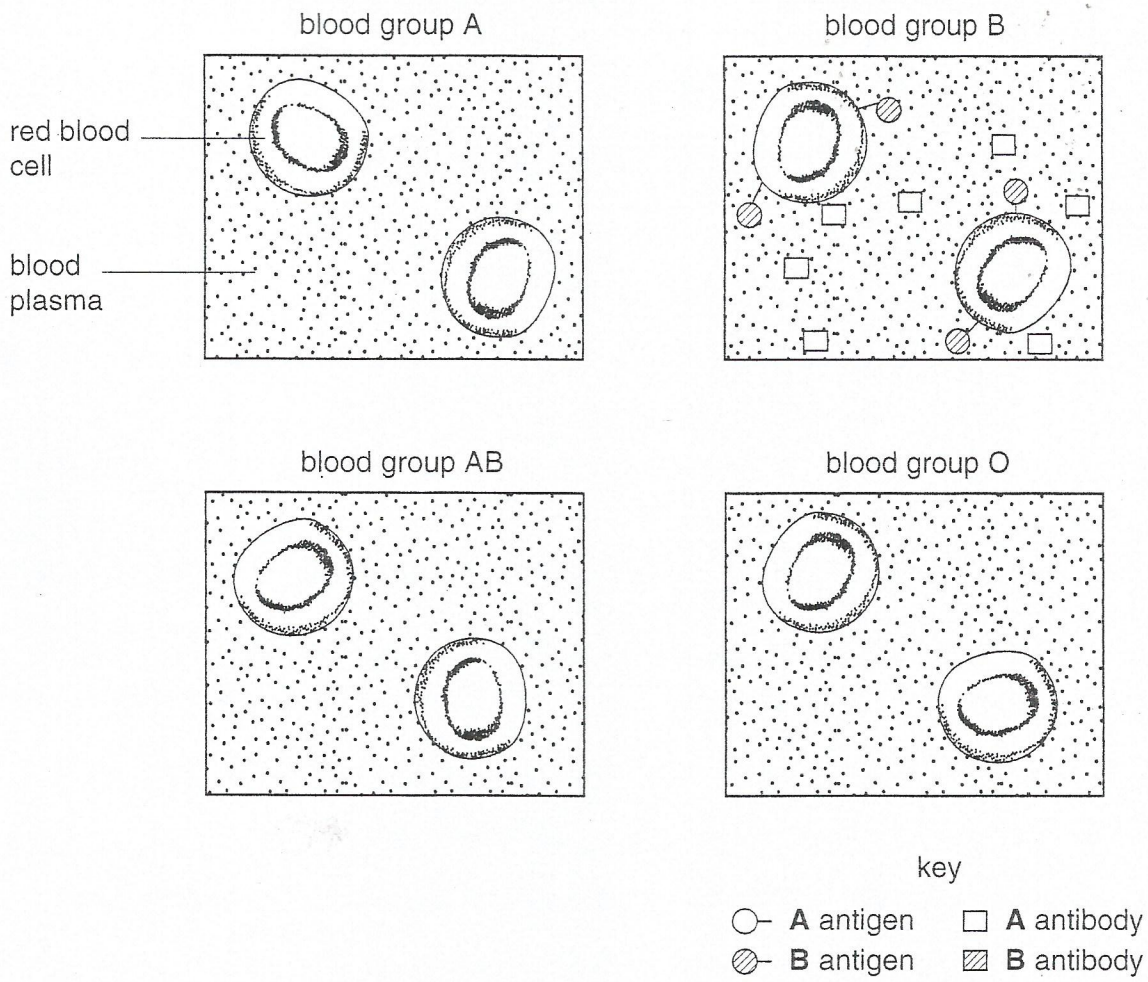

Fig. 2.1

(a) Using the key provided, complete Fig. 2.1 by showing antibodies and antigens for blood groups A, AB and O. Blood group B has been done for you, as an example. [3]

(b) Explain what happens when a person of blood group A donates blood to a patient with blood group O.

.....

.....

.....

.....

.....[3]

[Total : 6]

3 Fig. 3.1 shows a section through a flower.

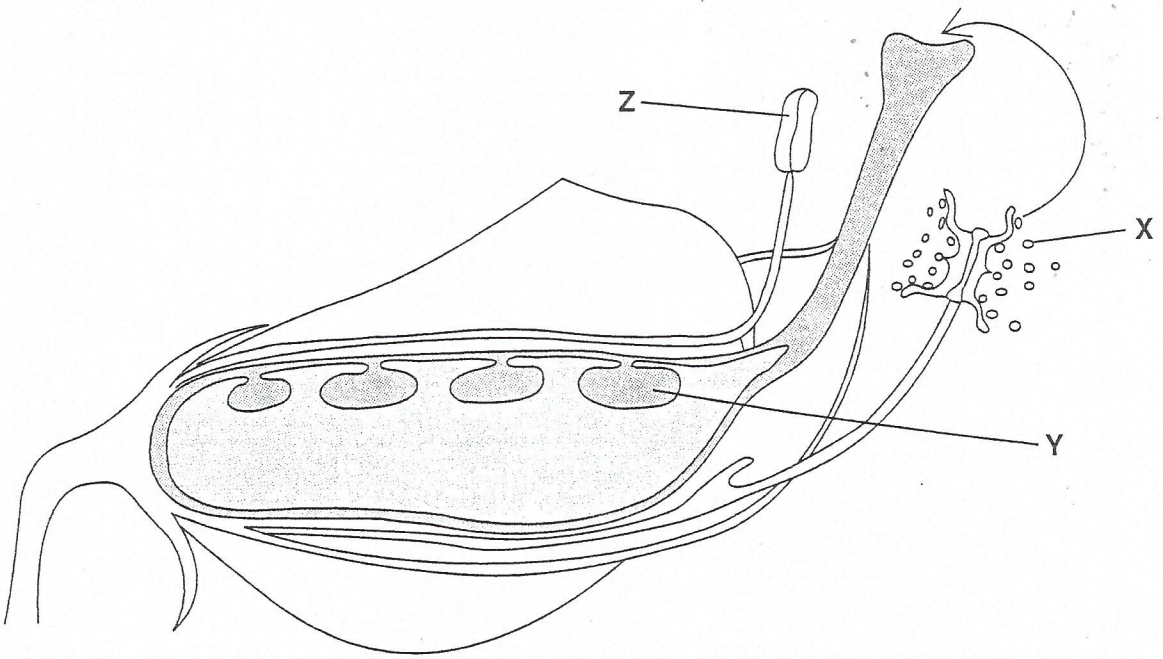

Fig. 3.1

(a) Identify structures **X** and **Y**.

X .....

Y .....[1]

(b) (i) Which type of cell division is responsible for the formation of gametes in structure **Z**?

.....[1]

(ii) What is the importance of the cell division in **(i)** in the life cycle of a flowering plant?

.....

.....

.....[3]

(iii) Describe the events occurring from pollination up to fertilisation.

.....

.....

.....

.....[3]

[Total : 8]

For Examiner's Use

4 Complete the passage by writing the most appropriate word(s) in each space.

Plants absorb water and mineral salts from the soil water surrounding the roots. The ..... increase the absorptive surface area of the roots.

Water molecules move into the root cells by ..... , while the mineral salts diffuse from the soil solution into the root cells. When the concentration of mineral ions in the cell sap is greater than in the soil solution, ... is used to move the ions into the root cells against the concentration gradient. This process is called ..... . The water in the roots moves up the plant through the ..... . The process that helps move the water and mineral salts up through the plant is called ..... .

[Total : 6]

[Turn over

5 Fig. 5.1 shows the control of the blood sugar level in the body.

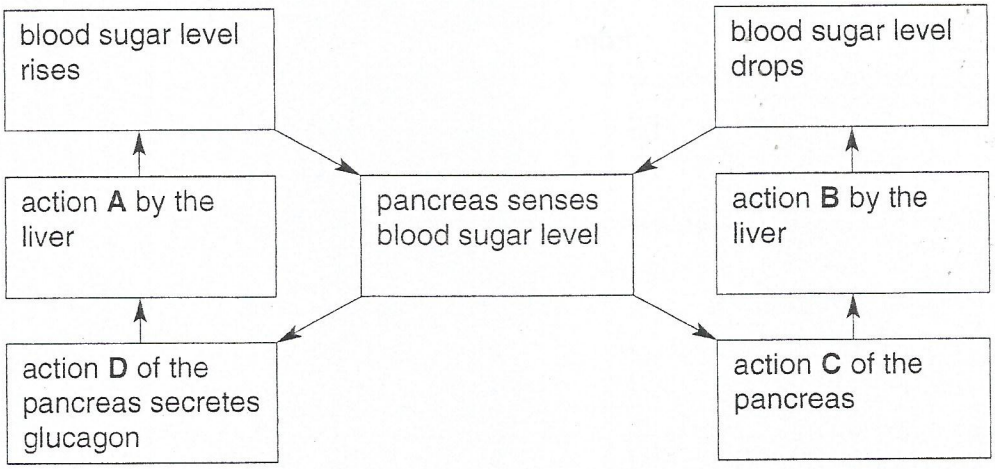

Fig. 5.1

(a) Name the blood sugar.

.....[1]

(b) Describe actions **A**, **B** and **C**.

A .....

.....

B .....

.....

C .....

.....[3]

(c) Fig. 5.1 shows an example of negative feedback.

Explain *negative feedback*, with reference to the control of body temperature.

.....

.....

.....

.....[3]

[Total : 7]

Fig. 6.1 shows a dialysis machine.

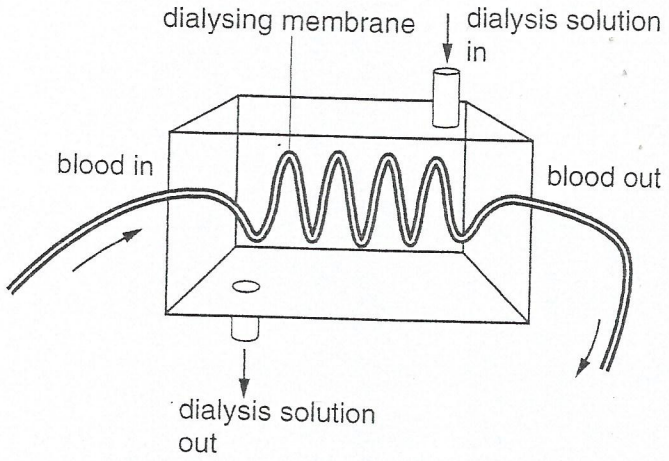

Fig. 6.1

(a) Name two substances that move from the patient's blood into the dialysis solution.

1. .....

2. .....[2]

(b) Explain why the blood in the dialysis tubing does not lose glucose to the dialysis solution.

.....

.....

.....[2]

(c) What property of the dialysis tubing enables urea to be 'excreted' from the patient's blood?

.....[1]

(d) Explain why the dialysis tubing is coiled.

.....

.....

.....[2]

(e) Suggest the advantages of using a dialysis machine over having a kidney transplant.

.....

.....

.....[2]

[Total : 9]

[Turn over

Section B

Answer **both** questions.

Write your answers on the separate answer paper provided.

7 **(a)** List **four** differences between bacteria and viruses. [4]

(b) State **four** ways in which AIDS is spread. [4]

(c) With reference to the structures of the male and the female reproductive systems, suggest why

(i) the risk of AIDS infection might be higher in females than in males;

(ii) a burning sensation when urinating is more likely to be experienced by males infected with gonorrhoea than by females infected with gonorrhoea. [5]

(d) Explain how infection by gonorrhoea affects the rate of AIDS transmission. [2]

[Total : 15]

8 **(a)** Briefly outline how energy flow compares with the movement of the element carbon in an ecosystem. [2]

(b) Describe the pollution of

(i) river water by sewage;

(ii) air by sulphur dioxide.

In each case, state the effect of such pollution on organisms. [11]

(c) State **two** benefits of the conservation of bees. [2]

[Total : 15]