

Candidate Name \_\_\_\_\_

Centre Number	Candidate Number

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

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

**SCIENCE**

**5125/4, 5126/4**

PAPER 4 Biology

**OCTOBER/NOVEMBER SESSION 2002**

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 any **two** 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 left hand column of the grid below.

**INFORMATION FOR CANDIDATES**

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

FOR EXAMINER'S USE	
Section A	
Section B	
<b>TOTAL</b>	

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



**Section A**

Answer **all** the questions.

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

1 (a) The following processes take place in the human gut.

**absorption      digestion      egestion      ingestion**

Use correct words from this list to fill in the gaps in the table in Fig. 1.1.

description of process	name of process
large food molecules are broken down into small molecules	
small molecules pass through the wall of the intestine into the blood	
undigested food is passed out of the anus	

[3]

**Fig. 1.1**

(b) Explain why large food molecules must be broken down into small molecules.

.....

.....

.....[2]

(c) The gall bladder stores a secretion involved in the process of digestion.

(i) Name this secretion.

.....[1]

(ii) Describe **two** functions of this secretion in digestion.

.....

.....

.....[2]

2 The diagram in Fig. 2.1 shows a section through part of a dicotyledonous leaf.

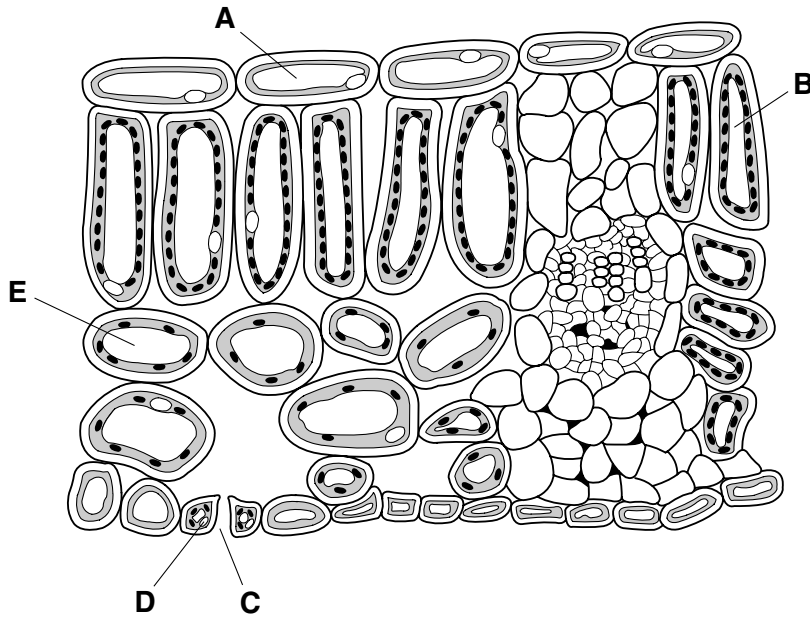


Fig. 2.1

(a) Name the parts labelled **A**, **B**, **C** and **D**.

**A** .....

**B** .....

**C** .....

**D** .....

[4]

(b) Cell **B** contains far more chloroplasts than cell **E**.

(i) What is the function of chloroplasts?

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

(ii) Explain the reason for the difference in the numbers of chloroplasts in cells **B** and **E**.

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

(c) (i) What is the function of **C**?

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

(ii) Briefly explain how cell **D** helps this function.

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

3 In some areas of the world a 'slash and burn' method of agriculture is used. Areas of tropical rain forest are cleared in this way to grow crops on the land. This is shown in the photograph in Fig. 3.1.



Fig. 3.1

After crops have been grown on this land for a few years it will be abandoned and a new area of forest will be cleared.

(a) Why can crops be grown on this land only for a few years?

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

(b) Describe **one** harmful effect that 'slash and burn' may have on the local area.

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

(c) Describe **one** harmful effect that 'slash and burn' may have on a wider international area.

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

4 The diagram in Fig. 4.1 shows part of the male human body.

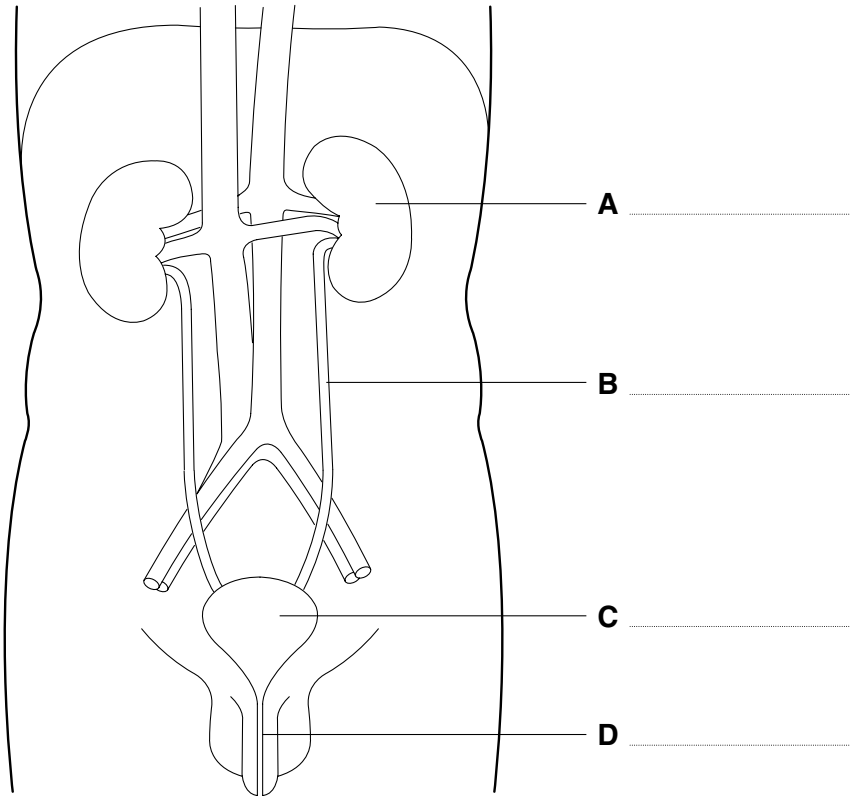


Fig. 4.1

(a) Label parts **A**, **B**, **C** and **D** on the diagram. [4]

(b) Describe the role played by each of these parts in the excretion of urea from the body.

**A**.....  
 .....  
**B**.....  
 .....  
**C**.....  
 .....  
**D**.....  
 ..... [4]

- 5 Gerbils are small rodents commonly kept as pets.

Gerbils can have brown or white fur. Brown fur is controlled by a dominant allele. The allele for white fur is recessive.

- (a) A pair of brown-furred gerbils have four offspring.

Three are brown and one is white.

Complete the diagram in Fig. 5.1 to show the genotypes of the gametes and of the offspring. Use **B** for the dominant allele for brown fur and **b** for the recessive allele for white fur.

		mother	
	gametes	Ⓚ	Ⓛ
father		<b>BB</b>	
		<b>Bb</b>	

Fig. 5.1

[4]

- (b) A breeder of gerbils wants to produce only offspring with white fur.

State the genotypes of the gerbils he must use as parents.

.....[1]

- 6 The diagram in Fig. 6.1 shows a section through the human heart.

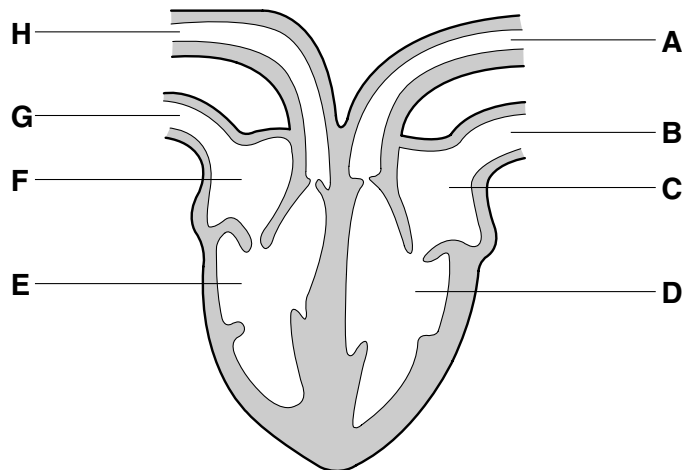


Fig. 6.1

- (a) (i) Which letter is used to label the main artery taking oxygenated blood to the body?  
 .....[1]
- (ii) Which letter is used to label the vein bringing deoxygenated blood back to the heart from the body?  
 .....[1]
- (iii) Which letters are used to label the **two** chambers of the heart that contain oxygenated blood?  
 .....[1]
- (b) Blood passes from chamber **F** to chamber **E**.
- (i) What makes blood flow from one chamber to another?  
 .....[1]
- (ii) What prevents the blood from flowing back into chamber **F**?  
 .....[1]



(c) (i) State **two** differences between the structure of an artery and that of a vein.

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

(ii) For **one** of these differences, explain how it is related to the functions of arteries and veins.

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

## Section B

Answer any **two** questions.

Write your answers on the separate answer paper provided.

- 7 (a) Describe the main features of the 28-day human menstrual cycle.

What may cause this cycle to last more or less than 28 days? [6]

- (b) Name and describe **two** methods of birth control. [4]

- 8 A student carried out an experiment to investigate how the activity of the enzyme amylase varies with pH. She measured the time taken for the same quantity of starch to be digested to sugar at different pH values.

Her results are shown in the graph in Fig. 8.1.

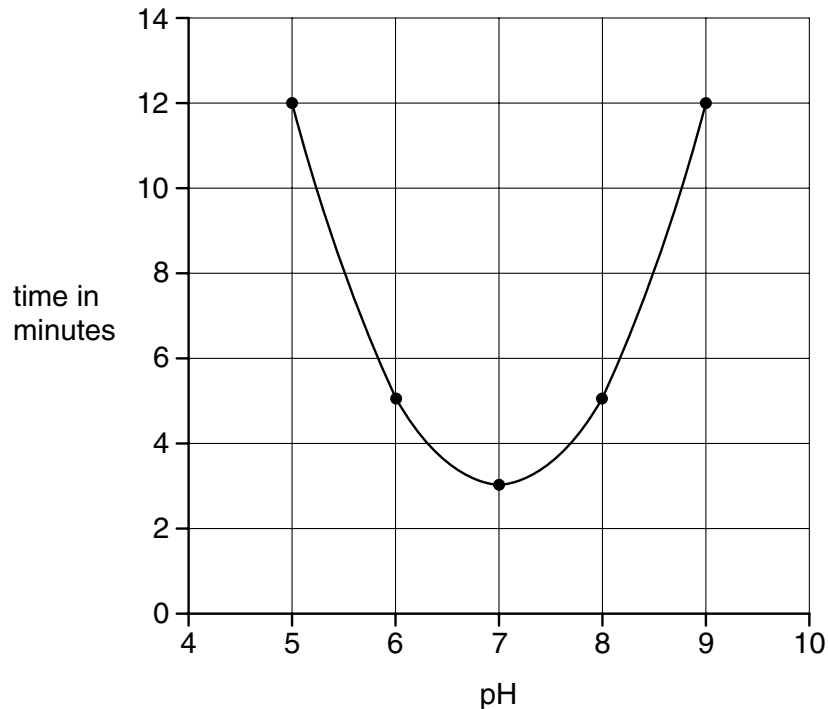


Fig. 8.1

- (a) Describe how you would carry out this investigation. [6]

- (b) Describe and explain what this experiment shows about the effect of pH on the action of amylase.

Name **one** other factor that affects the activity of enzymes. [4]

9 (a) Describe the path of water and the path of sugar in a plant.

How would you demonstrate the pathway of water in a plant stem? [6]

(b) Explain how water enters plant roots from the soil.

Describe the part played by root hairs in this process. [4]

