



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

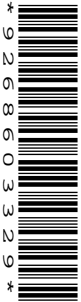
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**SCIENCE**

**5125/04**  
**5126/04**

Paper 4 Biology

**October/November 2008**

**1 hour 15 minutes**

Additional Materials: Answer Booklet/Paper

**READ THESE INSTRUCTIONS FIRST**

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.  
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.  
**DO NOT WRITE IN ANY BARCODES**

**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, fasten all your work securely together.  
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
<b>Section A</b>	
<b>Section B</b>	/
<b>Total</b>	

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

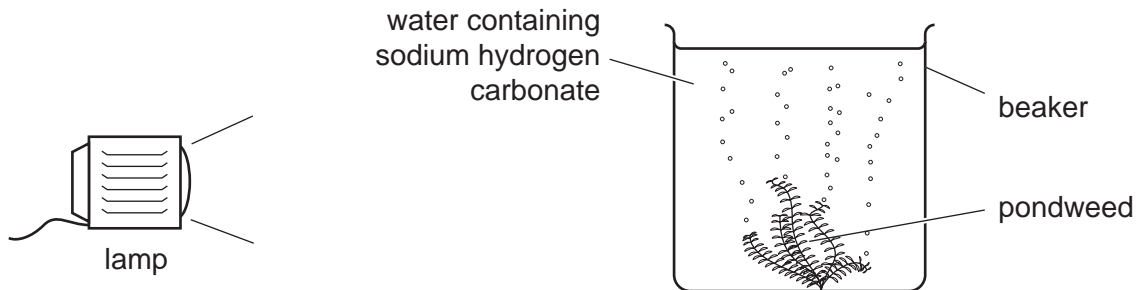


## Section A

Answer **all** the questions in the spaces provided.

For  
Examiner's  
Use

- 1 A student uses the apparatus shown in Fig. 1.1 to investigate the effect of changing light intensity on the rate of photosynthesis.



**Fig. 1.1**

The student counts the number of bubbles released by the pondweed in one minute. She repeats this with the lamp at different distances from the beaker.

- (a) How can the student make sure that this investigation uses fair testing?

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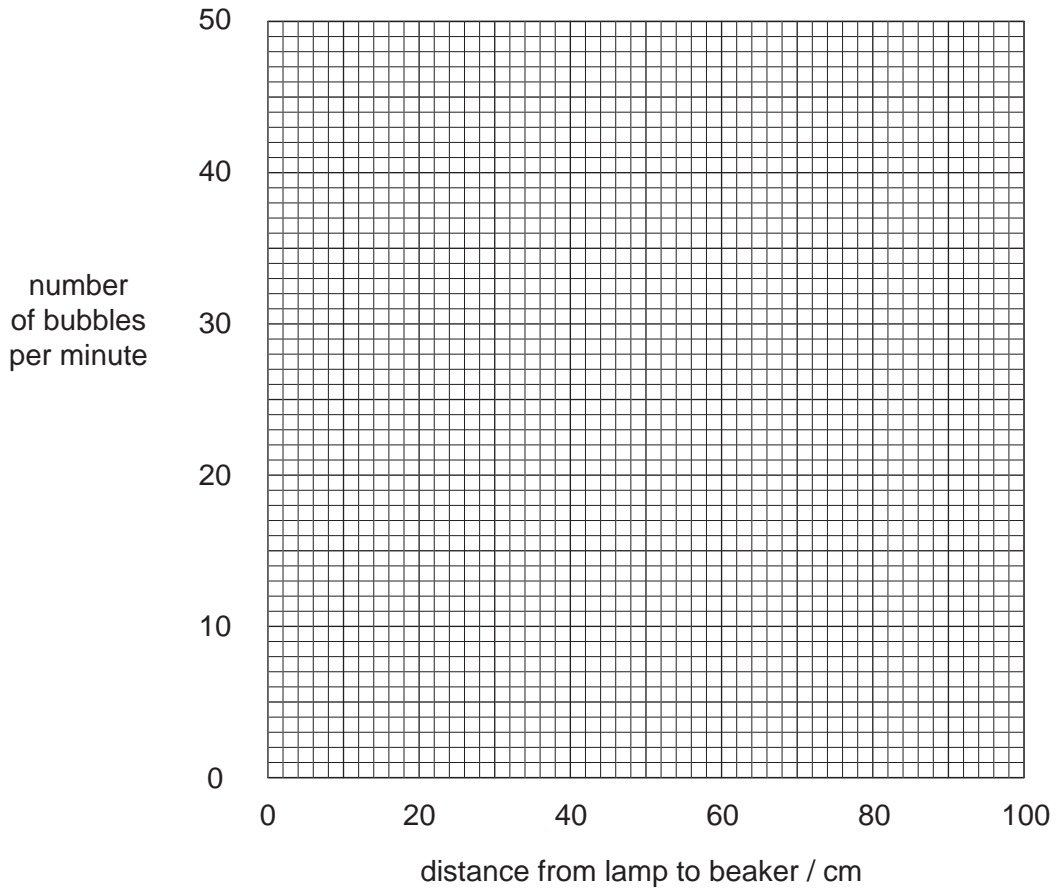
.....

..... [2]

- (b) Results from this investigation are shown in the table.

distance from lamp to beaker / cm	20	40	60	80	100
number of bubbles per minute	47	39	33	25	18

- (i) Plot these results on the grid. [3]
- (ii) Draw a line of best fit. [1]



(c) (i) What do these results show about the relationship between light intensity and rate of photosynthesis?

.....

.....

..... [2]

(ii) Suggest why light intensity has an effect on the rate of photosynthesis.

.....

..... [1]

(iii) Write a word equation for photosynthesis.

..... [1]

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

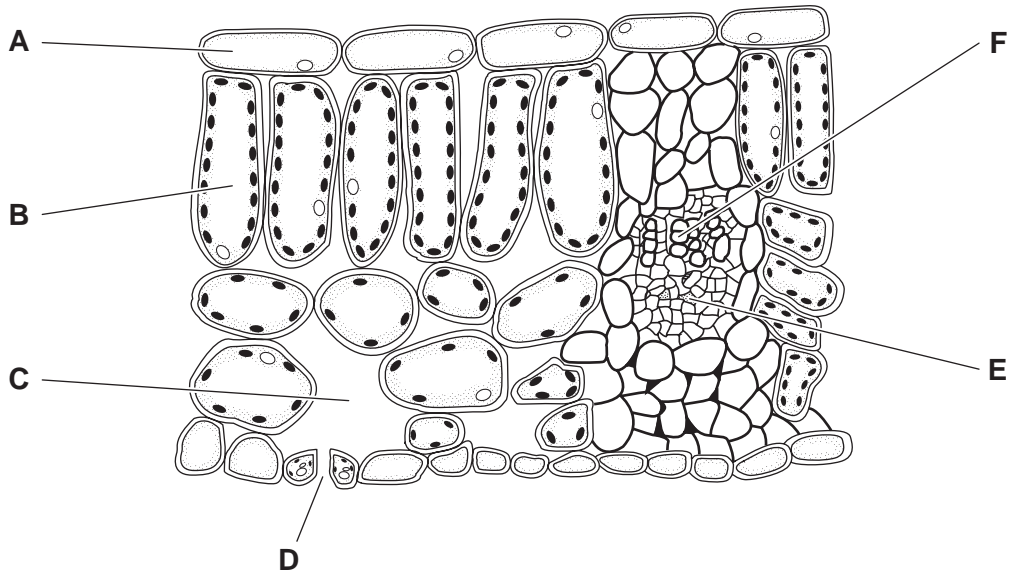


Fig. 2.1

(a) (i) Give the letter of the label line that points to a xylem vessel.

.....

[1]

(ii) Describe the functions of the xylem.

.....  
 .....  
 .....  
 .....

[3]

(b) (i) Name the part labelled D in Fig. 2.1.

..... [1]

(ii) Carbon dioxide moves from the air outside the leaf to the cell marked B.

Describe the role of the parts labelled C and D in this movement.

.....  
 .....  
 .....

[2]

(iii) What other function does the part labelled **D** have?

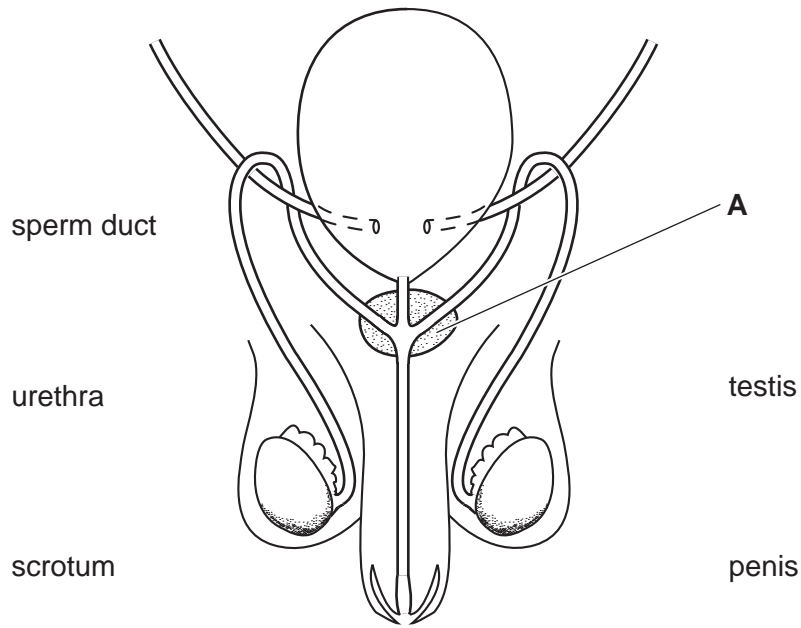
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.....

.....

..... [2]

3 Fig. 3.1 shows human male reproductive organs.



**Fig. 3.1**

(a) Draw a line from each of the five named organs to show its position in Fig. 3.1. [3]

(b) Describe the reproductive functions of the following organs.

(i) testis

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

(ii) penis

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

(iii) urethra

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

(c) Name the structure labelled **A**.

..... [1]

- (d) (i) Describe and explain a surgical method of birth control that can be carried out on male reproductive organs.

*For  
Examiner's  
Use*

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

- (ii) Mark with an X on Fig. 3.1 where this method is performed. [1]

4 After it is eaten, food passes through the alimentary canal.

(a) The list shows processes carried out by parts of the alimentary canal.

**absorption      digestion      egestion      ingestion**

List these processes in the order in which they are carried out.

first .....

.....

.....

last .....

[3]

(b) In the alimentary canal, starch is broken down. This chemical reaction is speeded up by an enzyme.

(i) Name the enzyme involved in the breakdown of starch.

..... [1]

(ii) Name the product of this breakdown.

..... [1]

(iii) Explain why it is necessary for starch to be broken down before it can be used by the body.

.....

.....

..... [2]

(c) If a person eats more carbohydrate than needed for energy production, the excess may be converted into fat.

(i) Suggest a function of this fat in the body.

..... [1]

(ii) What health problems may be caused by an excess of fat formation?

.....

.....

..... [2]



- 5 A farmer sprays the crops in a field with herbicide each year. A few weeks after spraying he counts the number of weed plants in sample areas of the field. The number of weed plants counted after each spraying is shown in Fig. 5.1.

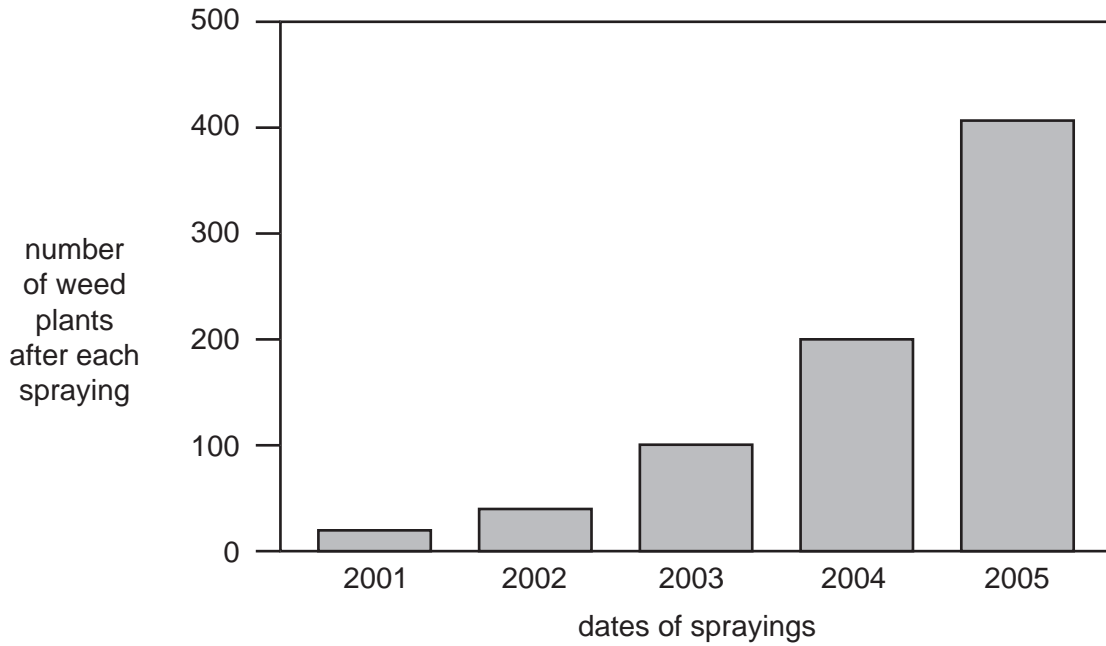


Fig. 5.1

The farmer thinks that a mutation has caused the weeds to become resistant to the herbicide.

- (a) Explain what is meant by the term *mutation*.

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

- (b) Explain how the results in Fig. 5.1 suggest that a mutation has taken place.

.....  
 .....  
 .....  
 ..... [3]

- (c) The farmer thinks that chemicals in the herbicide may have caused this mutation.

What else could have caused the mutation?

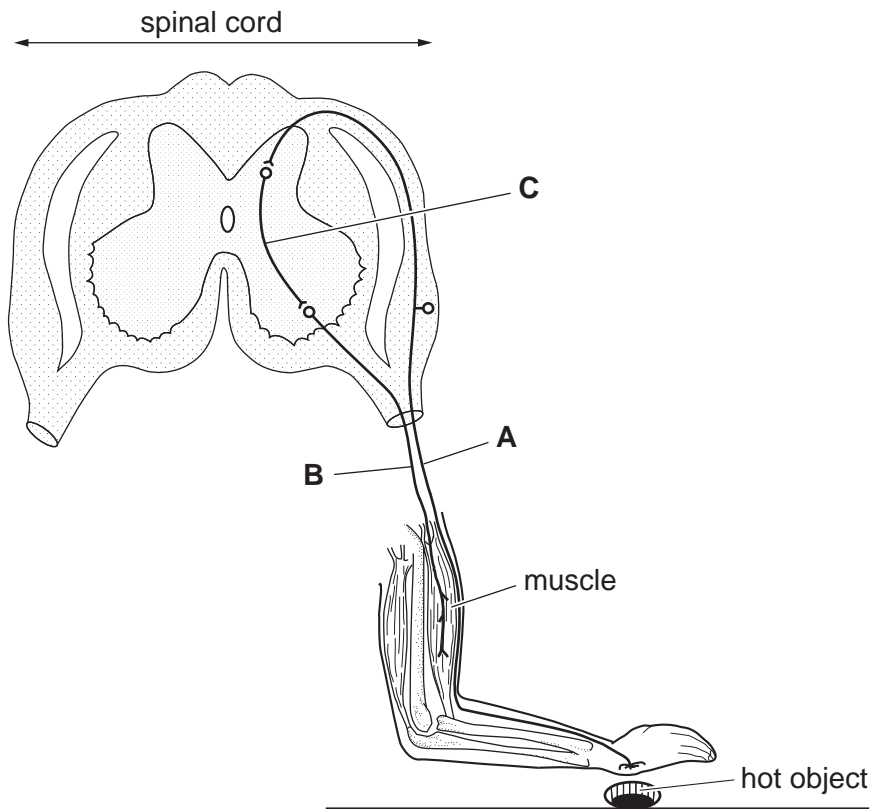
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## Section B

Answer **two** questions from this section.

Write your answers on the separate answer paper provided.

- 6 When a hand touches a hot object it is quickly moved away from the heat. This movement results from a reflex action.

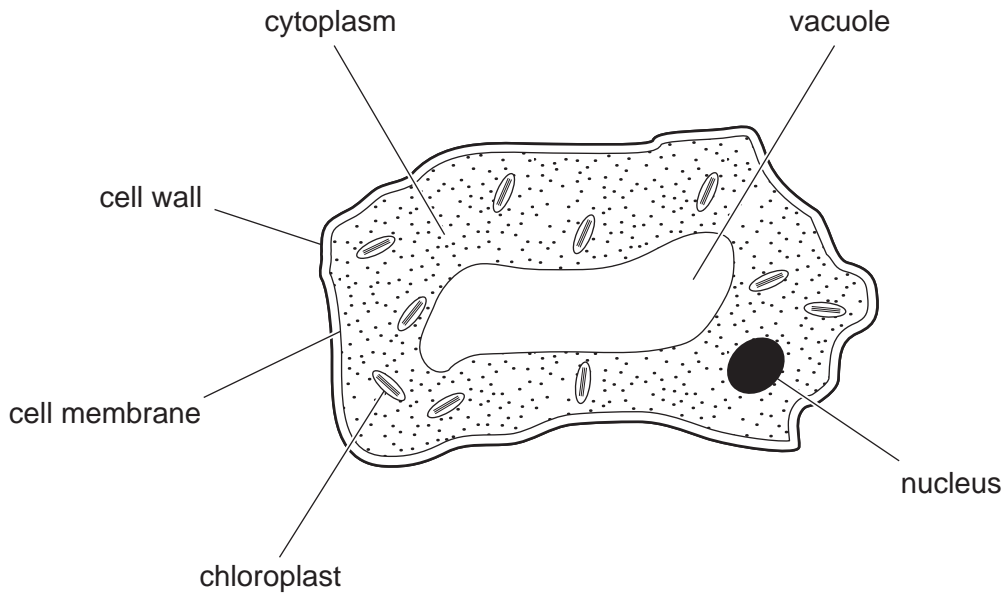


**Fig. 6.1**

- (a) Name the parts labelled **A**, **B** and **C** in Fig. 6.1, and explain how they are involved in the reflex action. [6]
- (b) Reactions to external stimuli are slowed down by the presence of alcohol in the body. This increases the chances of a car driver having an accident.

What other harmful effects can excessive intake of alcohol have? [4]

7 Fig. 7.1 shows a typical plant cell.



**Fig. 7.1**

(a) Explain how substances pass into and out of this cell. [5]

(b) Name a specialised plant cell.

Describe how the structure of the cell you have named is different from the typical plant cell shown in Fig. 7.1.

Explain how these differences enable the specialised cell to perform its functions. [5]

8 The list shows organisms in a food web in an area of forest and rivers.

**algae    caterpillar    fish    hawk    sparrow    tree    water flea**

(a) Construct a food web containing all of these organisms.

Explain why, although there are large numbers of caterpillars and water fleas in this area, there are only a few hawks. [7]

(b) Suggest the effect on this food web when the trees in this area are cut down. [3]

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