



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

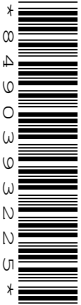
CANDIDATE  
NAME

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**SCIENCE**

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

Paper 4 Biology

**October/November 2007**

**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>	

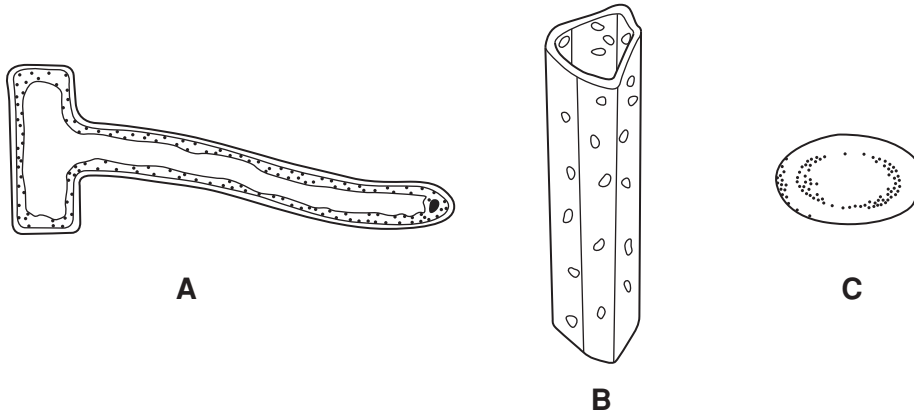
This document consists of **12** printed pages.



**Section A**

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

1 Fig. 1.1 shows three types of cells, not drawn to scale.



**Fig. 1.1**

(a) What is the name of cell **A**?

.....[1]

(b) (i) **B** is a xylem vessel.

State two functions that this vessel performs in a plant.

1. ....

2. ....[2]

(ii) The cells forming the xylem vessel have no chloroplasts or vacuoles.

In what other way is this type of cell different from a typical plant cell?

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

(iii) Explain how this difference helps this type of cell to perform its function.

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

(c) C is a component of blood.

(i) What is the name of this type of cell?

.....[1]

(ii) This cell has no nucleus.

Explain how this helps the cell perform its function in the body.

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

2 Digestion of food begins in the mouth.

The enzyme amylase is released from the salivary glands and begins to break down food components.

(a) (i) Explain why it is necessary for food to be digested.

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

(ii) Name the substrate and end product of digestion by amylase.

substrate .....

end product ..... [2]

(b) Fig. 2.1 shows how the rate of breakdown of the substrate by amylase varies with temperature.

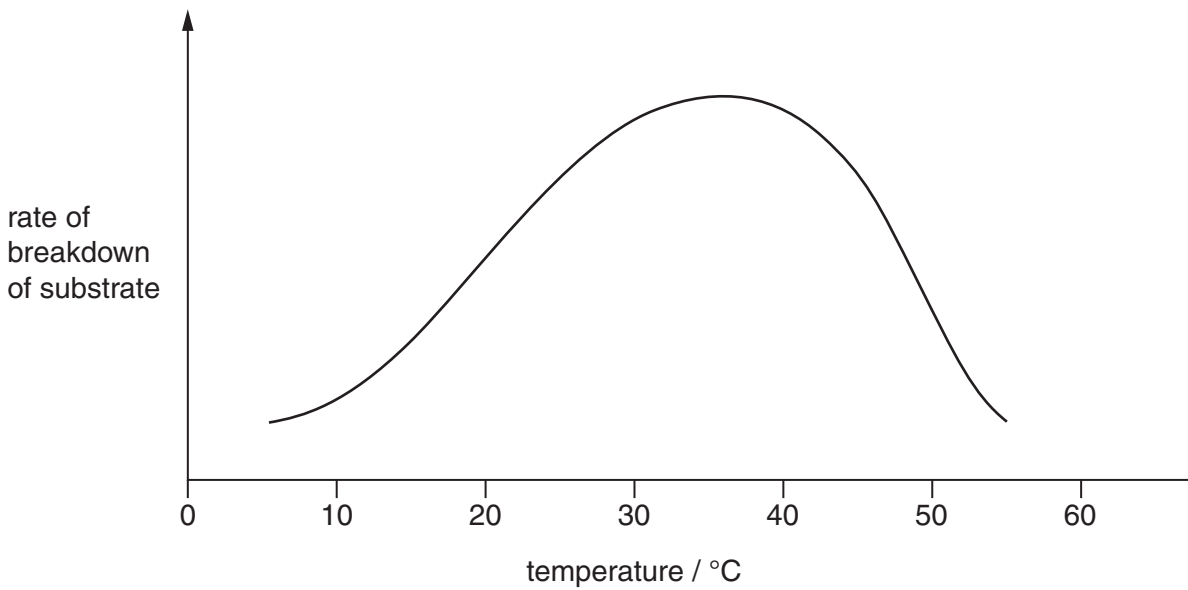


Fig. 2.1

Explain the following observations.

(i) The rate of breakdown is low at high temperatures.

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

(ii) The enzyme works best at about 37 °C.

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

(c) State **one** other factor that will affect the rate of substrate breakdown.

.....[1]

3 A student cut five identical pieces of potato, 5 cm long.

He placed each piece in a different concentration of sucrose solution for one hour.

He then measured the length of each piece of potato.

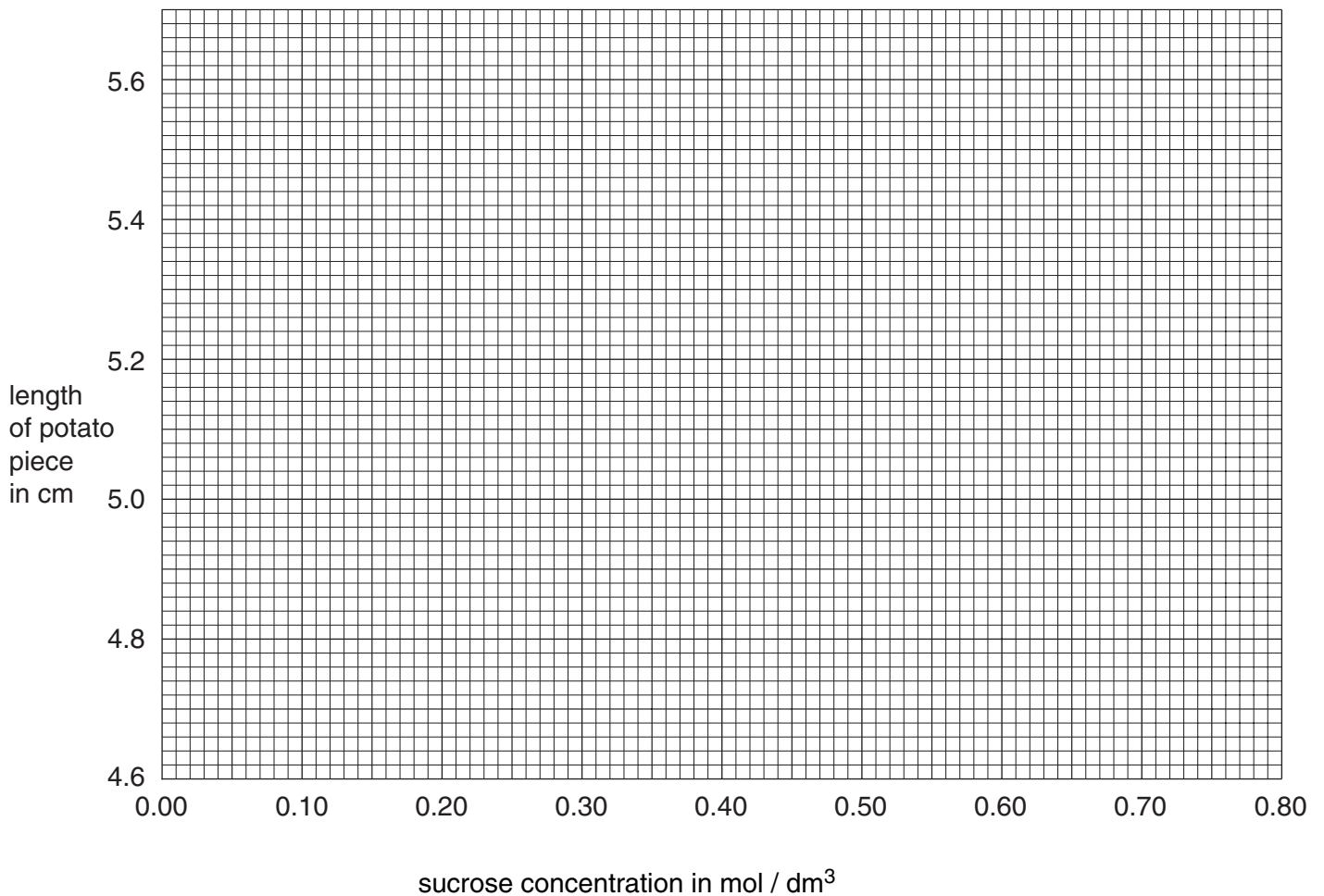
His results are shown in Fig. 3.1.

sucrose concentration in mol / dm <sup>3</sup>	length of potato piece in cm
0.00	5.62
0.20	5.38
0.40	5.12
0.60	4.87
0.80	4.62

**Fig. 3.1**

(a) (i) Plot these results on the grid. [2]

(ii) Use a ruler to draw the best fit line through the points. [1]



(b) What is the name of the process that caused the potato pieces to change length?

.....[1]

(c) (i) Explain why some of the potato pieces increased in length.

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

(ii) Explain why some of the potato pieces decreased in length.

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

(d) (i) Use your graph to find the concentration of sucrose that would have resulted in no change in the length of potato.

..... mol/dm<sup>3</sup> [1]

(ii) Explain why this sucrose concentration would not result in a change of length.

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

- 4 A student uses a plant with variegated leaves to investigate photosynthesis. She places the plant in a dark place for 24 hours. She attaches black paper to both sides of a leaf as shown in Fig. 4.1

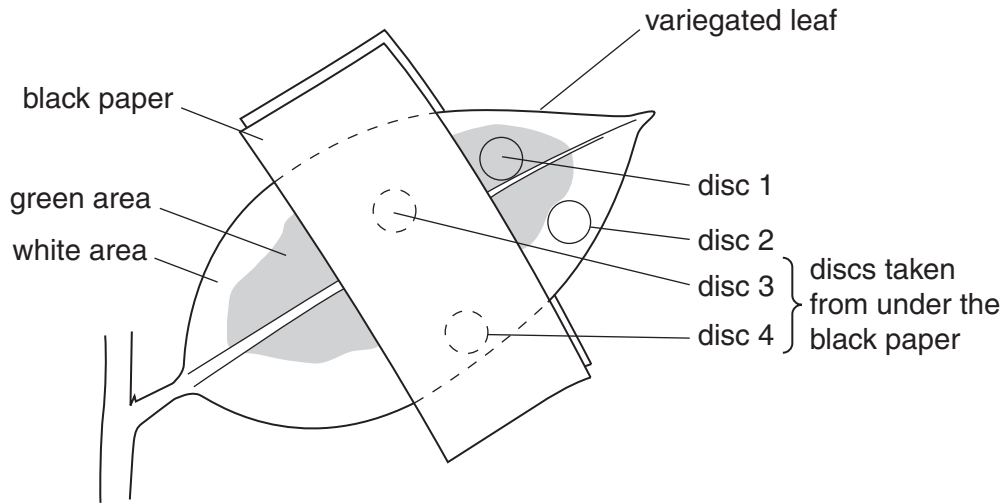


Fig. 4.1

She places the plant in bright sunlight for several hours.

She then cuts discs from the leaf as shown and tests them for the presence of starch using iodine solution.

Iodine solution is yellow, but goes a blue/black colour when in contact with starch.

The results from her experiment are shown in Fig. 4.2.

disc number	colour of iodine solution	presence of starch
1	blue/black	yes
2	yellow	no
3	yellow	no
4	yellow	no

Fig. 4.2

- (a) Write a symbol equation for photosynthesis.

.....[2]

- (b) Suggest why the student places the plant in the dark for 24 hours at first.

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



(c) Explain each of the following observations.

(i) Starch is present in disc 1.

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

(ii) There is no starch in disc 2.

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

(iii) There is no starch in disc 3.

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

(d) Suggest **two** reasons why there is no starch in disc 4.

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

5 Fig. 5.1 shows component parts of the human eye.

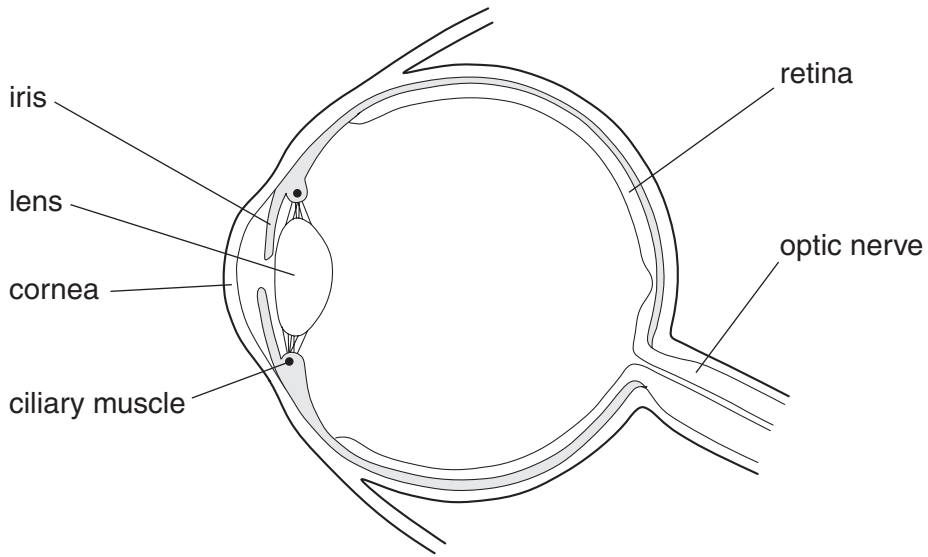


Fig. 5.1

(a) (i) Which two of the labelled parts are involved in focusing light onto the retina?

1. ....

2. ....

[2]

(ii) Describe how the eye changes focus from a distant object to a close object.

.....

..... [2]

(b) The iris is responsible for controlling the amount of light entering the eye.

The response of the iris to bright light is a reflex action.

Explain how this reflex action takes place.

Use the following terms in your answer.

- |                      |               |                        |
|----------------------|---------------|------------------------|
| <b>motor neurone</b> | <b>muscle</b> | <b>optic nerve</b>     |
| <b>relay neurone</b> | <b>retina</b> | <b>sensory neurone</b> |

.....

.....

.....

.....

.....

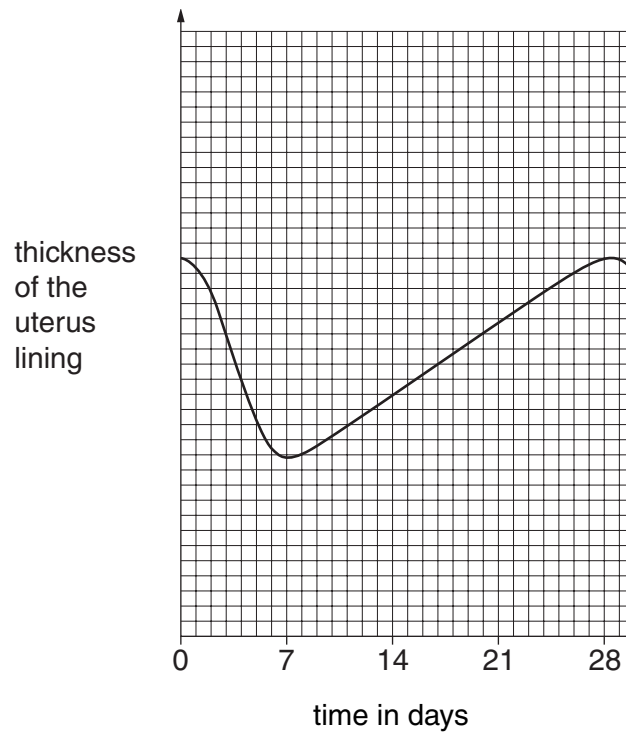
..... [5]

## Section B

Answer **two** questions from this section.

Write your answers on the separate answer paper provided.

- 6 Fig. 6.1 shows how the thickness of the uterus lining of a woman changes during each 28-day menstrual cycle.



**Fig. 6.1**

- (a) Describe and explain these changes in the thickness of the uterus lining during the menstrual cycle.

What factors may cause variation in the length of a woman's menstrual cycle? [5]

- (b) Describe fertilisation and the early development of the embryo from a zygote. [5]

7 Fig. 7.1 shows an alveolus and a nearby capillary in a human lung.

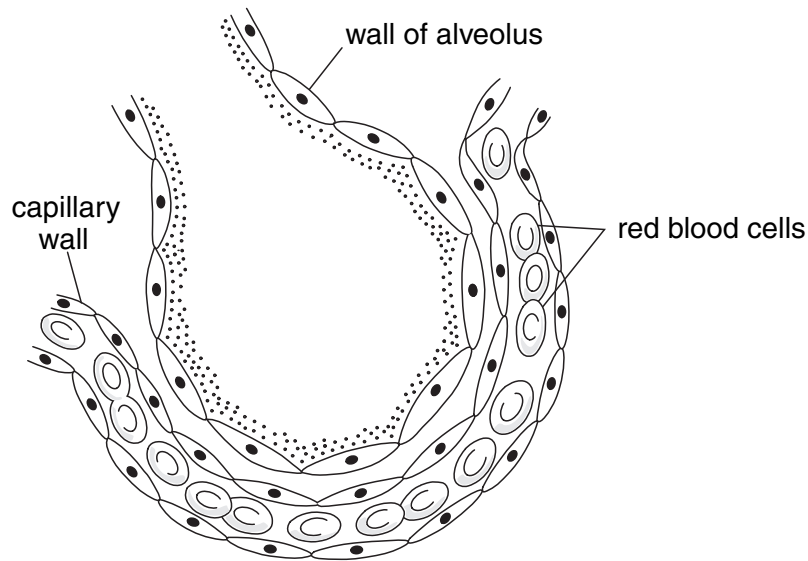


Fig. 7.1

- (a) Describe how gaseous exchange takes place in this alveolus.  
Explain how the structure of the alveoli enables this process to take place rapidly. [5]
- (b) Compare the processes of aerobic and anaerobic respiration in humans.  
Describe the circumstances under which anaerobic respiration may occur in human muscle tissue. [5]

- 8 (a) Describe the water cycle.  
Include a diagram to help your answer. [6]
- (b) Describe how water is polluted by the actions of Man.  
Explain the undesirable effects of this pollution. [4]

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