UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/62**

Paper 6 Alternative to Practical **October/November 2011**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen in the space provided on the Question paper.
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.

Answer **both** questions.
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.

This document consists of **7** printed pages and **1** blank page.

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UNIVERSITY of CAMBRIDGE International Examinations

[Turn over

1 An investigation was carried out into the effect of temperature on the rate of activity of the enzyme, catalase, found in liver, on its substrate, hydrogen peroxide :

- Some fresh liver was ground with a small volume of water and sand in a mortar.
- This mixture was then filtered to produce a solution that contained the enzyme.
- Small samples of the enzyme solution and the substrate were each kept at the temperatures shown in Table 1.1 before being mixed together.
- On mixing, a mass of bubbles was released, forming a layer of foam on the surface of the liquid.
- The depth of this layer was measured after a time as an indication of the rate of reaction.

The results are shown in Table 1.1.

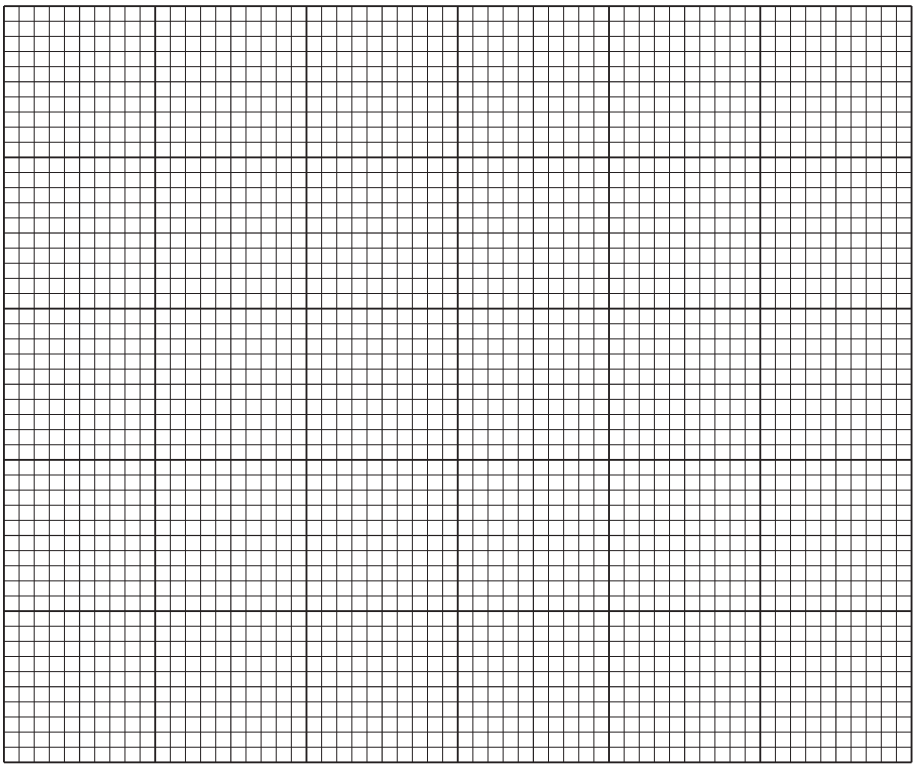
Table 1.1

temperature / °C	depth of foam / mm
10	07
20	15
35	41
45	39
55	19
60	06

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(a) (i) Construct a graph from the figures in Table 1.1 on the grid below.

The curve should be a line of best fit.



[4]

(ii) By referring to the curve, suggest the optimum temperature for this enzyme and the depth of foam that would be produced.

optimum .....

foam depth .....

[2]

(iii) Suggest what would have been observed if both the enzyme solution and the substrate had been kept at 90 °C before being mixed together. Explain your answer.

.....

.....

..... [2]

(b) (i) Suggest why sand was added to the liver during the grinding.

.....

.....

..... [2]

(ii) State how you could test that the bubbles of gas forming the foam are oxygen.

.....

.....

..... [2]

(c) (i) State how this investigation could be improved to give a more accurate figure for the optimum temperature.

.....

.....

..... [2]

(ii) Suggest ways in which the results of this investigation could be made more reliable.

.....

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.....

..... [4]

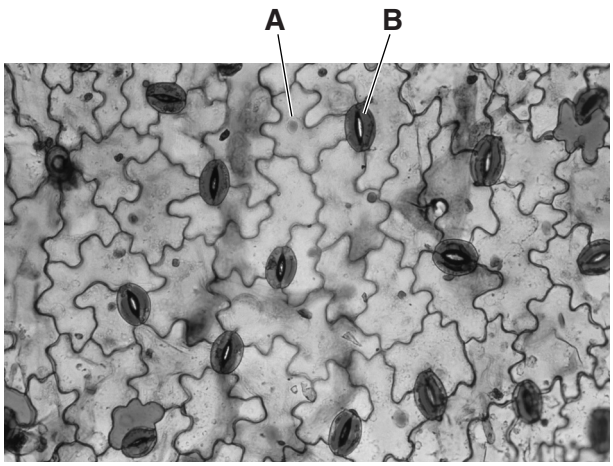
[Total: 18]

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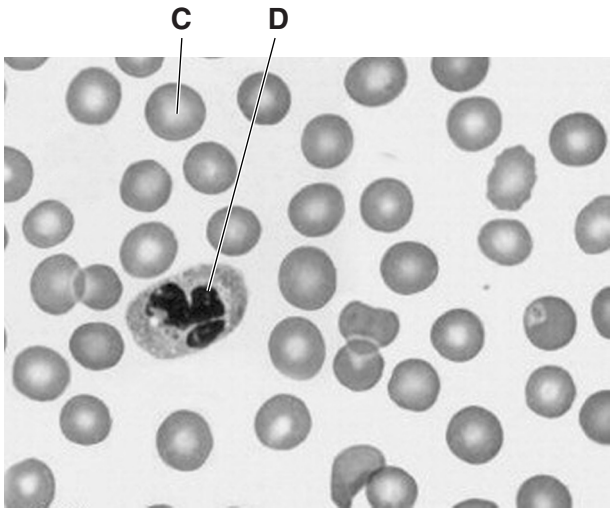
Turn over for Question 2

2 Fig. 2.1 and Fig. 2.2 show two different tissues.



× 400

Fig. 2.1



× 800

Fig. 2.2

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

A .....

B .....

C .....

D .....

[4]

(ii) State the functions of cells **A**, **B**, **C** and **D**.

A .....

.....

B .....

.....

C .....

.....

D .....

.....

[4]

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(b) Describe, giving practical details, how you would prepare and examine a tissue such as that shown in Fig. 2.1.

.....

.....

.....

..... [3]

(c) **(i)** Make large, labelled drawings of cell **C** and cell **D** shown in Fig. 2.2.

[3]

(ii) Calculate the magnification of your drawing of cell **D** compared with the actual size of cell **D** that was photographed in Fig. 2.2.
Show all working clearly, including where measurements were taken.

magnification ..... [4]

(d) Complete Table 2.1 to show four differences in the appearance of cell **A** and cell **D**.

Table 2.1

	feature	cell **A**	cell **D**
1			
2			
3			
4			

[4]

[Total: 22]

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