UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

CANDIDATE
NUMBER

Biology

Paper 5 Practical Test

0610/05

October/November 2009

1 hour

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

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.
You may use a pencil for any diagrams or graphs.
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.

For Examiner's Use	
1	
2	
Total	

This document consists of **8** printed pages.

UNIVERSITY *of* CAMBRIDGE
International Examinations

[Turn over

1 Catalase is an enzyme found in potato tissue which breaks down hydrogen peroxide into water and oxygen.

$$2\,H_2O_2 \quad \rightarrow \quad 2\,H_2O \quad + \quad O_2$$

Safety: hydrogen peroxide is an oxidising agent and safety glasses must be worn throughout this experiment.

Please read through the whole question before you start this experiment.

You will carry out an experiment to find the effect of pH on the activity of catalase.

You are provided with five test-tubes containing the same volume and concentration of hydrogen peroxide solution.

The pH buffer has already been added to keep the pH of the reaction constant.

The tubes are labelled pH 3, pH 4, pH 5, pH 7 and pH 8.

The oxygen given off will be recorded by counting the number of bubbles from the end of the tube using the apparatus as shown in Fig.1.1.


hydrogen peroxide and buffer solution

potato pieces

water

bubbles to be counted
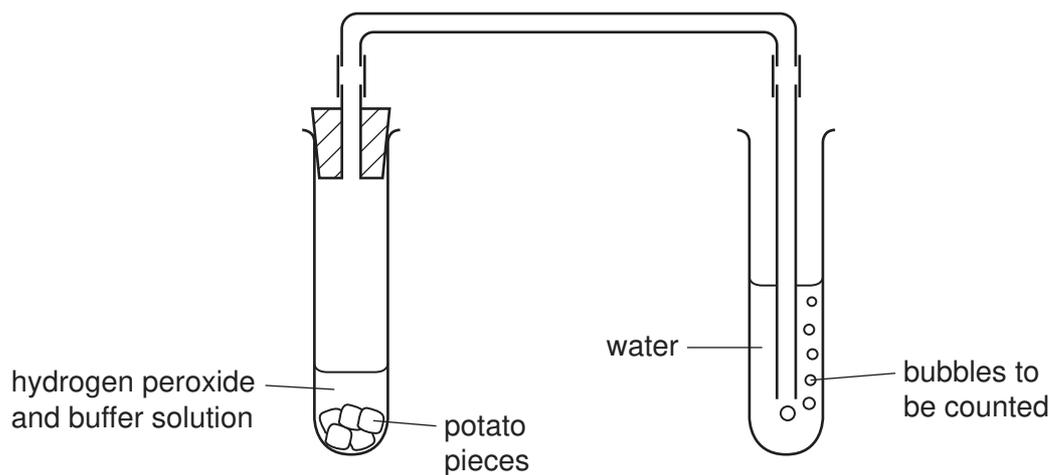
Fig. 1.1

(a) (i) Prepare a suitable table below to record your findings.

[1]

- Set up the apparatus before beginning the experiment. Make sure that the open end of the delivery tube is below the water surface in the test-tube.

- Be prepared to count the number of bubbles given off for a fixed time (no more than 2 minutes).

- Using the cutting tool, cut five cubes of tissue, each $1\,cm^3$, from the potato slice provided.

- Using the same tool, cut up one of these cubes of potato into smaller pieces.

- Quickly add the small pieces into the test-tube labelled pH 3 and push the bung into the test-tube.

- Count the bubbles given off.

(ii) Record your result in your table.

[1]

- Repeat the procedure for each of the other cubes with the remaining four pH solutions.

(iii) Record these results in your table.

[4]

(b) (i) Plot a line graph to show the number of oxygen bubbles produced against pH .
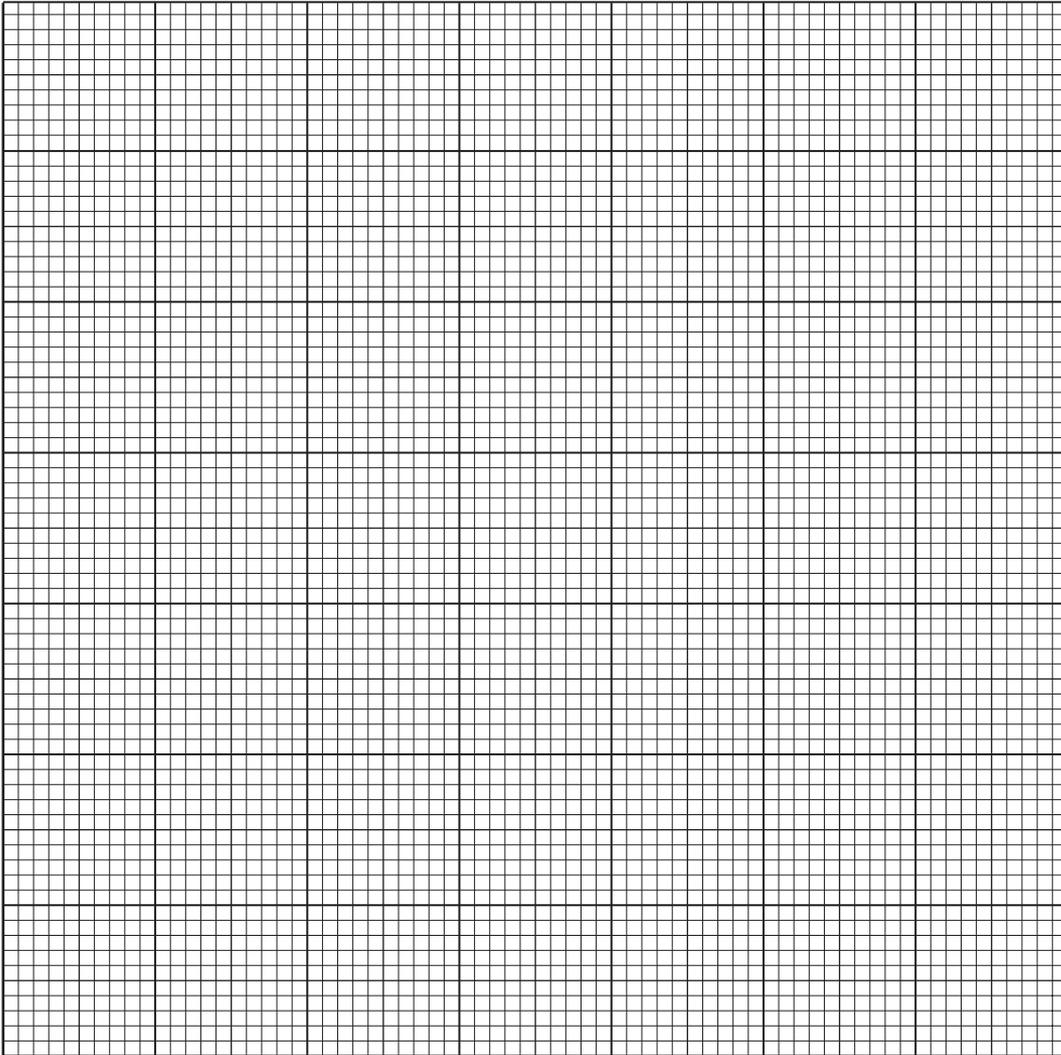
[4]

(ii) Describe the relationship between pH and the number of oxygen bubbles produced.

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.... [2]

(c) Suggest four ways in which this investigation could be improved.

1. ....

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2. ....

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3. ....

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4. ....

.... [4]

(d) Suggest how this experiment could be changed to investigate the effect of temperature on the activity of catalase.

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.... [6]

[Total: 22]

2 You have been provided with two insect-pollinated dicotyledonous flowers of the same species, **W1** and **W2**.

- Using the cutting tool, cut **W1** vertically to show the internal structures.

(a) Make a large, labelled drawing of the visible floral parts.

[6]

The second flower, **W2**, is more mature.

- Remove the petals.

- Using the cutting tool, cut horizontally through the seed producing structure as shown in Fig. 2.1. This will show the arrangement of the seeds.
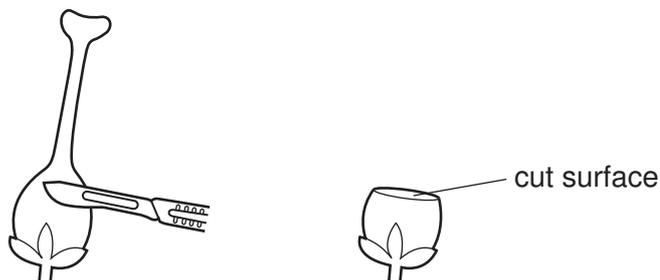

cut surface

Fig. 2.1

(b) Make a labelled drawing of this cut surface.

[4]

Fig. 2.2 shows the structure of a wind-pollinated flower, **W3**.

(c) Using labels on Fig. 2.2, explain **how** the floral parts are adapted for this type of pollination.
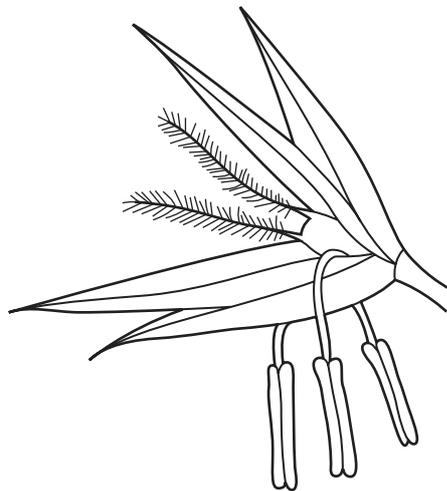

Fig. 2.2

[3]

(d) (i) State **one** similarity between the flowers **W1** and **W3** for pollination.

....

.... [1]

(ii) Complete Table 2.1 to show four adaptations for pollination of flowers **W1** and **W3**.

Table 2.1

	W1	**W3**
difference 1	………………………………….. ………………………………….	…………………………………….. ……………………………………
difference 2	………………………………….. ……………………………………	…………………………………… ……………………………………
difference 3	………………………………….. ……………………………………	…………………………………….. ………………………………………
difference 4	…………………………………… ……………………………………	…………………………………… ……………………………………

[4]

[Total: 18]