UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/31**

Paper 3 Practical Test **October/November 2012**

1 hour 15 minutes

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, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** 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	
3	
Total	

This document consists of **10** printed pages and **2** blank pages.

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In order to plan the best use of your time, read through all the questions on this paper carefully before starting work.

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1 Enzymes are used commercially to extract juice from apples.

You will investigate the effect of an enzyme on the extraction of apple juice.

You are provided with

- apple pulp in a container, labelled **W1**.
- 5 cm^3 of 2% enzyme solution in a test-tube, labelled '**2% enzyme**'.
- 5 cm^3 of water in a test-tube labelled '**no enzyme**'.
- two small containers.

Proceed as follows:

- Label the two small containers, **A** and **B**.
- Using a plastic spoon divide the apple pulp equally into the two containers.
- Take the container of apple pulp, labelled **A**, add the contents of the test-tube labelled '**2% enzyme**'. Stir the mixture carefully with a plastic spoon.
- Remove, wash and wipe the spoon before using it again.
- To the container of apple pulp, labelled **B**, add the contents of the test-tube labelled '**no enzyme**'. Stir the mixture carefully with the plastic spoon.

Record the time when you have completed this.

time .....

Allow the two containers **A** and **B** to stand for 10 minutes to allow the enzyme to react.

Use the 10 minutes to read through the following instructions you will be carrying out and answer **(a)**.

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Stage 1 After the 10 minutes, filter each of the mixtures found in containers **A** and **B**, using the two sets of apparatus provided, as shown in Fig. 1.1.

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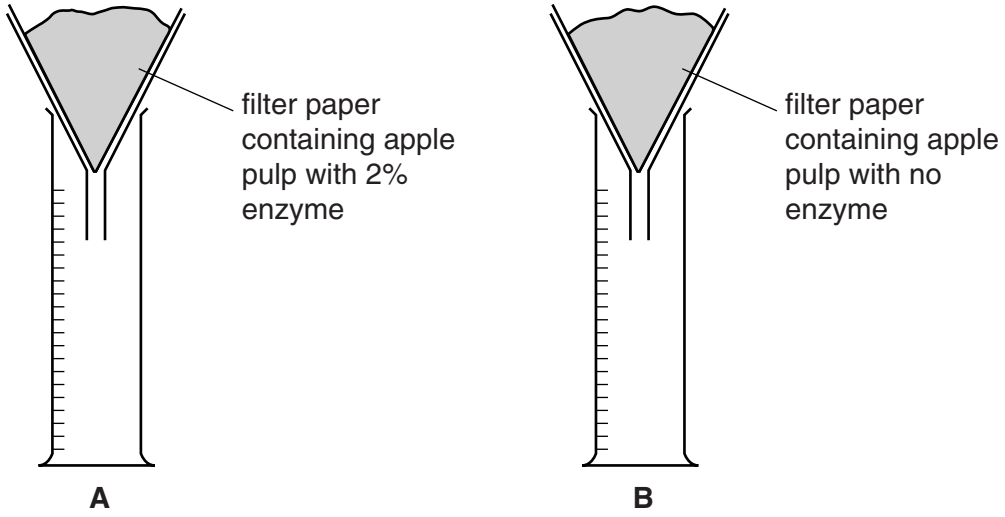


Fig. 1.1

Stage 2 Allow the juice to filter from each mixture for 12 minutes.

Use this 12 minutes to answer **(c)** and **(d)**

Stage 3 Record the appearance of juice from each container, **A** and **B**, in your table.

Stage 4 Measure the volume of juice collected from each mixture. Record the volumes in your table.

(a) Construct a table to record the appearance and volume of juice collected from each mixture.

[6]

(b) With reference to your results, compare the volume and appearance of the two juices extracted.

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.....

.....[3]

(c) Explain why the following procedures were carried out.

(i) washing the plastic spoon

.....

.....[1]

(ii) stirring the mixtures

.....

.....[1]

(iii) adding 5 cm^3 of water in the test-tube labelled '**no enzyme**'.

.....

.....

.....[2]

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(d) Some students carried out a similar investigation to find the effect of pH on the production of apple juice using this enzyme.

Fig. 1.2 shows a graph of their results.

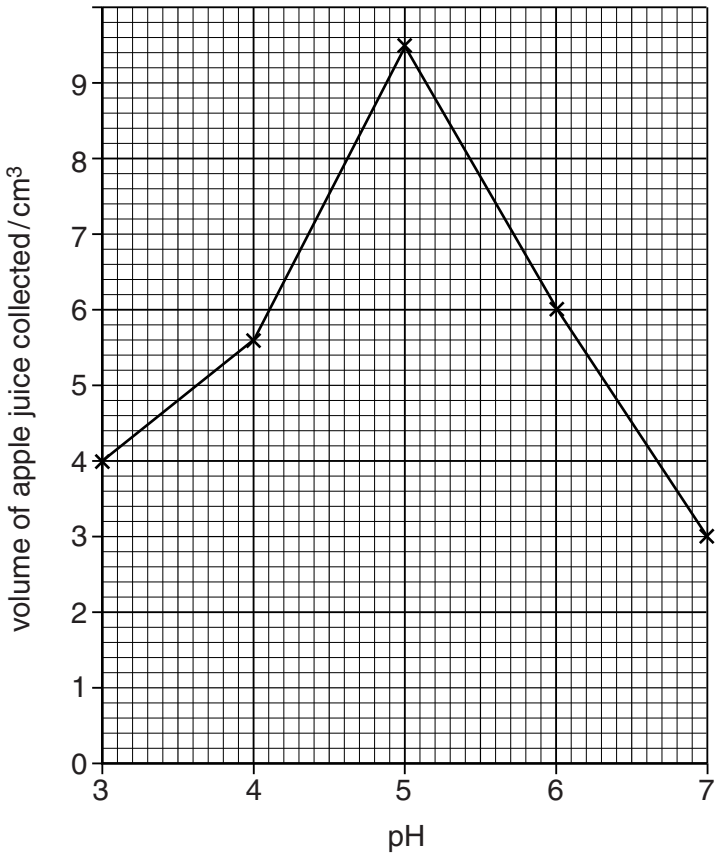


Fig. 1.2

(i) State the optimum pH for the action of this enzyme.

..... [1]

(ii) Describe and explain the effect of pH on the production of apple juice, using this enzyme.

.....

.....

.....

.....

.....

.....[2]

Return to the instructions for stages 3 and 4, complete (a) and (b).

[Total: 16]

2 You are provided with part of a cucumber fruit, labelled **K1**.

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(a) (i) Make a large drawing of the whole of one of the cut surfaces of **K1**.

[5]

(ii) Measure the diameter of your specimen, **K1**.

..... mm

Draw a line across your drawing to show where you measured the equivalent diameter.

Measure this diameter on your drawing.

..... mm

Calculate the magnification of your drawing.

Show your working.

magnification .....

[4]

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You are now to investigate the effect of water and salt solution on thin slices of this fruit, **K1**.

- Cut two fresh slices no thicker than 2 mm from one end of **K1**.
- Place these slices on the white tile, remove the central fleshy area and the seeds and discard. **Do not cut the outer green layer.**
- Leave one whole slice on the white tile for a control.
- Cut the other slice into two equal pieces as shown in Fig. 2.1.

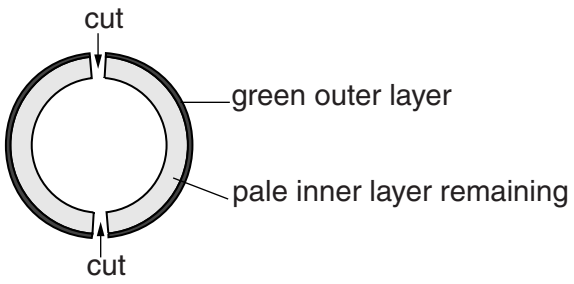


Fig. 2.1

- Place one of these pieces in the dish labelled '**water**' and the other piece into the dish labelled '**salt solution**'.
- Leave for 2 minutes.

(b) (i) After 2 minutes, complete Fig. 2.2 by drawing the two pieces and describing their appearance.

in water	**in salt solution**
before after	before after
appearance	appearance .....
.....	.....
.....	.....

[4]

Fig. 2.2

(ii) Explain any changes that you have observed in terms of osmosis.

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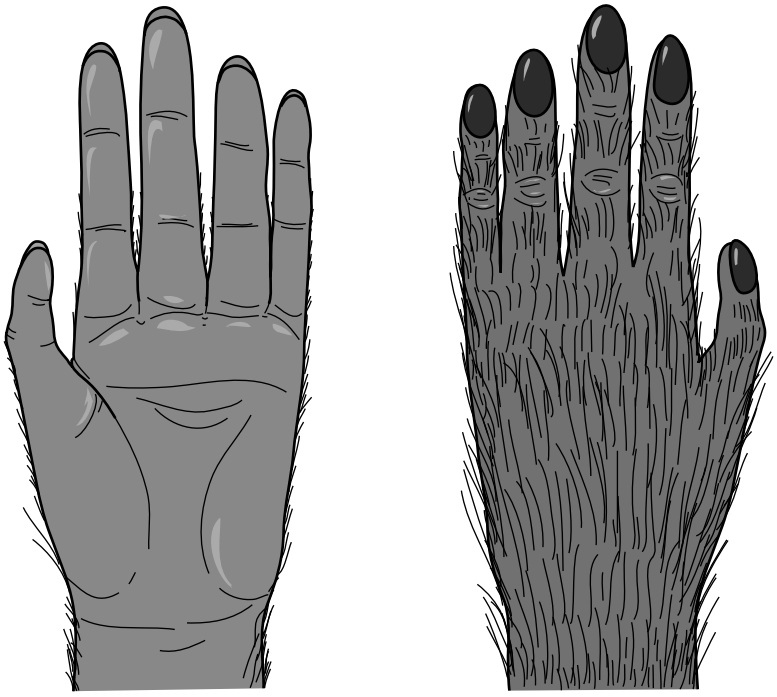
.....[4]

[Total: 17]

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3 Fig. 3.1 shows a hand of an orang-utan (not to scale), a mammal that lives in trees.

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lower surface (palm) upper surface (back)

Fig. 3.1

- Carefully examine the lower surface (palm) and the upper surface (back) of the hand in Fig. 3.1.
- Carefully examine your own hand and compare it with the orang-utan.

(a) (i) Describe **three** visible **similarities** between your hand and that of the orang-utan shown in Fig. 3.1.

1. .....

2. .....

3. .....[3]

(ii) Describe **two** visible **differences** between your hand and that of the orang-utan shown in Fig. 3.1.

1. .....

2. .....[2]

(b) The hairs on the skin can play a part in maintaining a constant internal body temperature in a mammal.

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Describe **one** way, **not** involving hairs, in which the skin helps to lower the internal body temperature when it rises above normal.

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.....[2]

[Total: 7]

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