UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER					

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **October/November 2012**

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.
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.

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1	
2	
3	
Total	

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

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1 Enzymes are used commercially to extract juice from apples.

Fig. 1.1 shows two containers of apple juice. One contains juice extracted using an enzyme and the other without an enzyme.

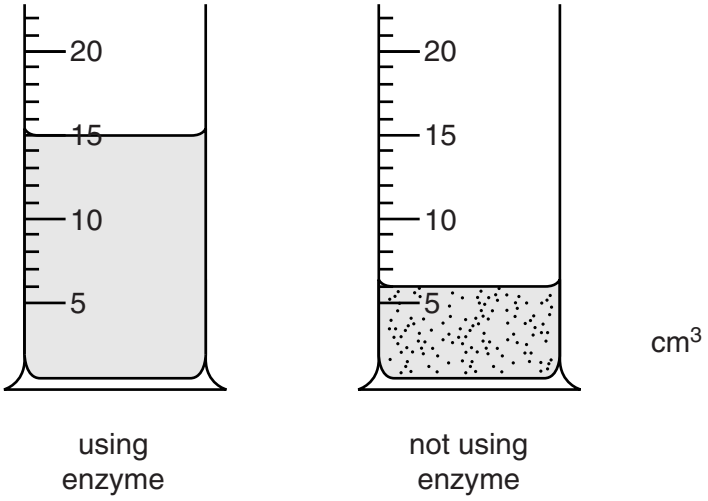

Fig. 1.1

(a) With reference to Fig. 1.1, compare the volume and appearance of the two juices extracted.

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..... [3]

Some students investigated the effect of pH on the production of apple juice using the same enzyme.

- The apples were chopped up and formed into a smooth pulp.
- The pulp was divided into samples. Each sample was adjusted to a different pH.
- Enzyme was stirred into each sample of pulp and left to stand for 10 minutes for the enzyme to react.
- The mixtures of pulp and enzyme were then filtered for 20 minutes to collect the juice. The volumes of apple juice collected, are shown in Table 1.1.

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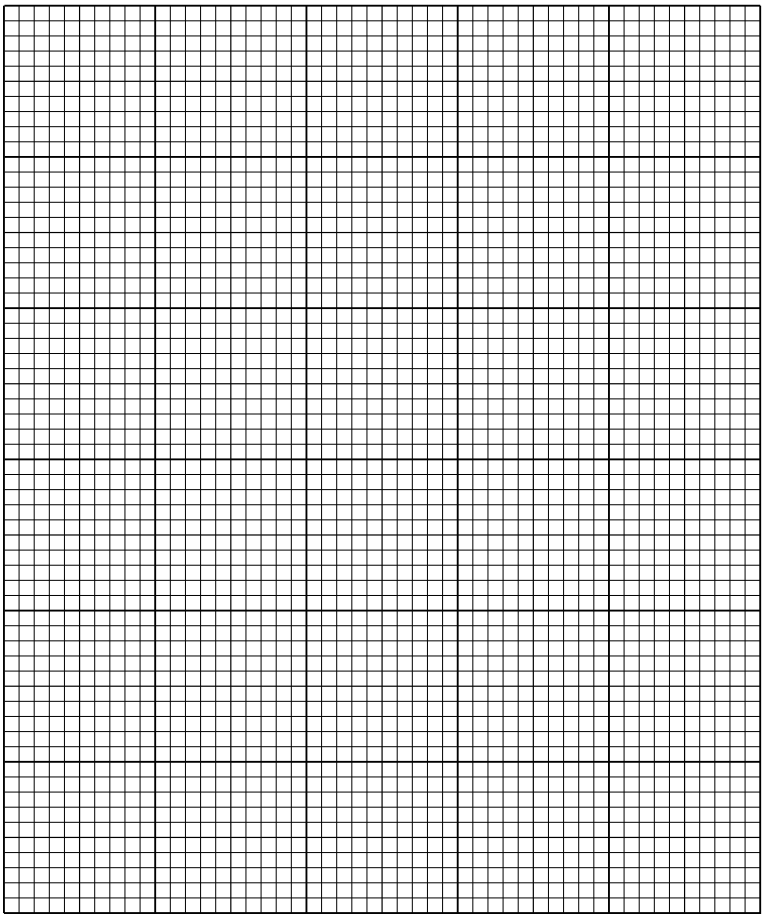
Table 1.1

pH	volume of apple juice collected / cm^3
3	40
4	56
5	95
6	60
7	30

(b) **(i)** Construct a graph to show the effect of pH on the production of apple juice using this enzyme.



[4]

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

..... [1]

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

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(c) Suggest the factors that need to be controlled in this investigation.

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[Total: 14]

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2 Fig. 2.1 shows an onion cut in half.

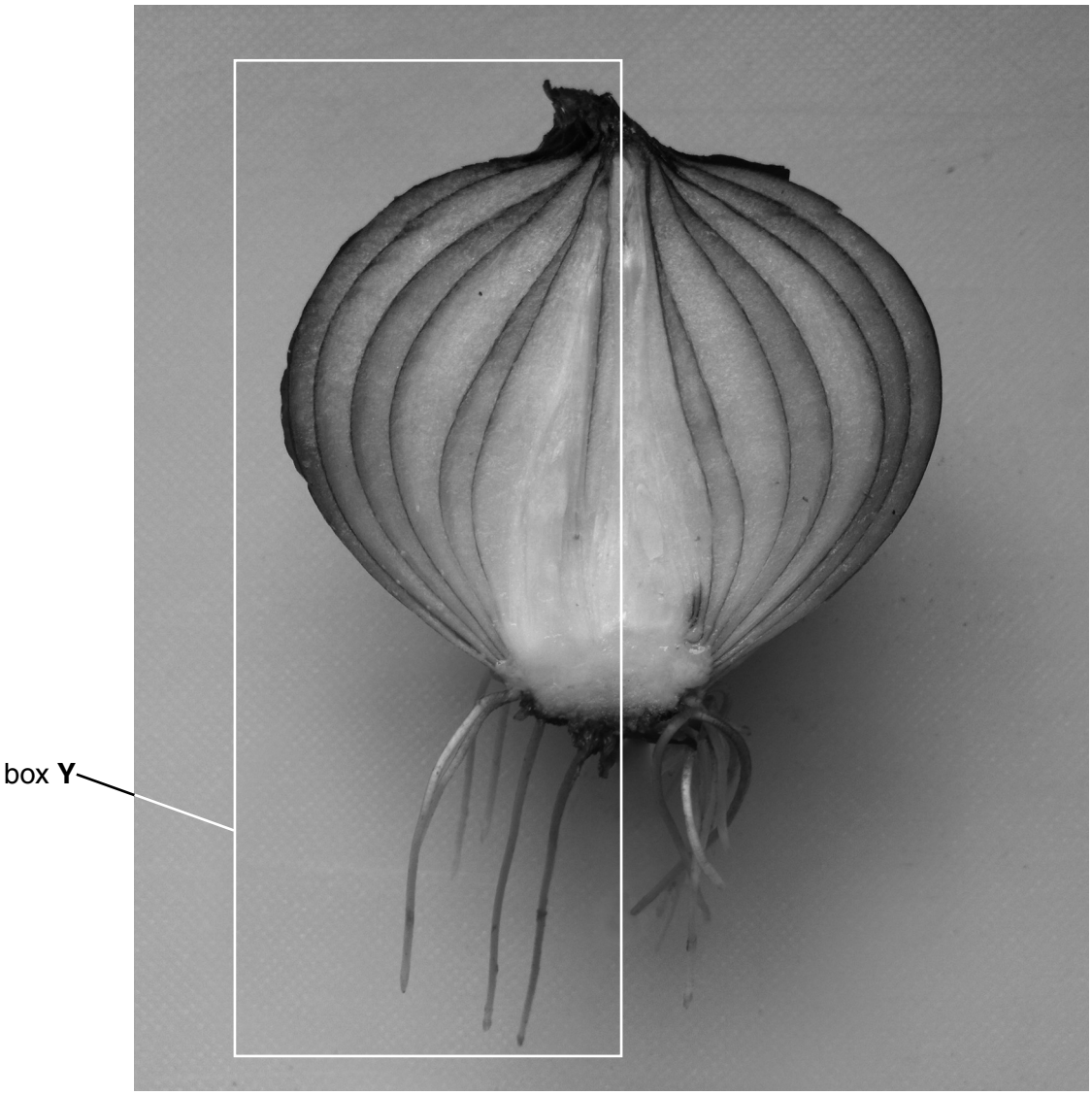

Fig. 2.1

(a) Make a large drawing of the cut surface of the onion as shown in box **Y** on Fig. 2.1.

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[5]

A layer of cells can easily be peeled off an onion bulb.
Fig. 2.2 shows this layer mounted in water and viewed under a microscope.

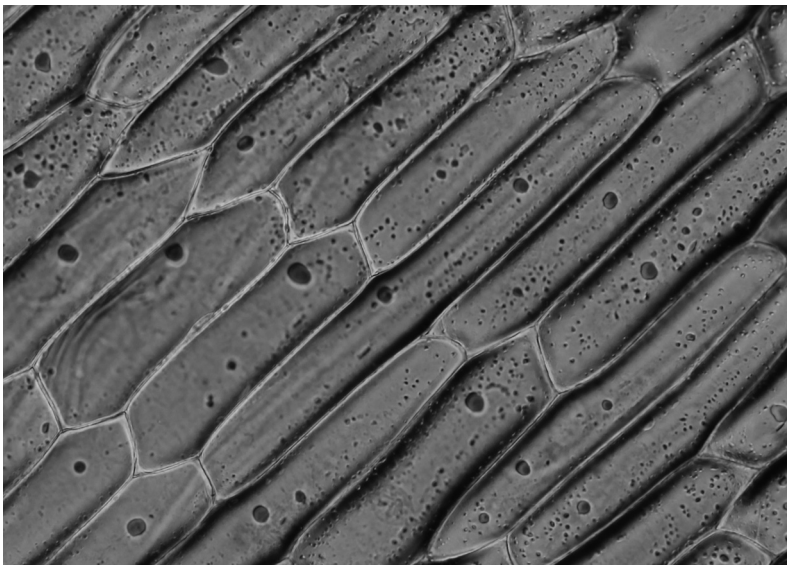

Fig. 2.2

Fig. 2.3 shows these cells at the same magnification but now mounted in a salt solution.

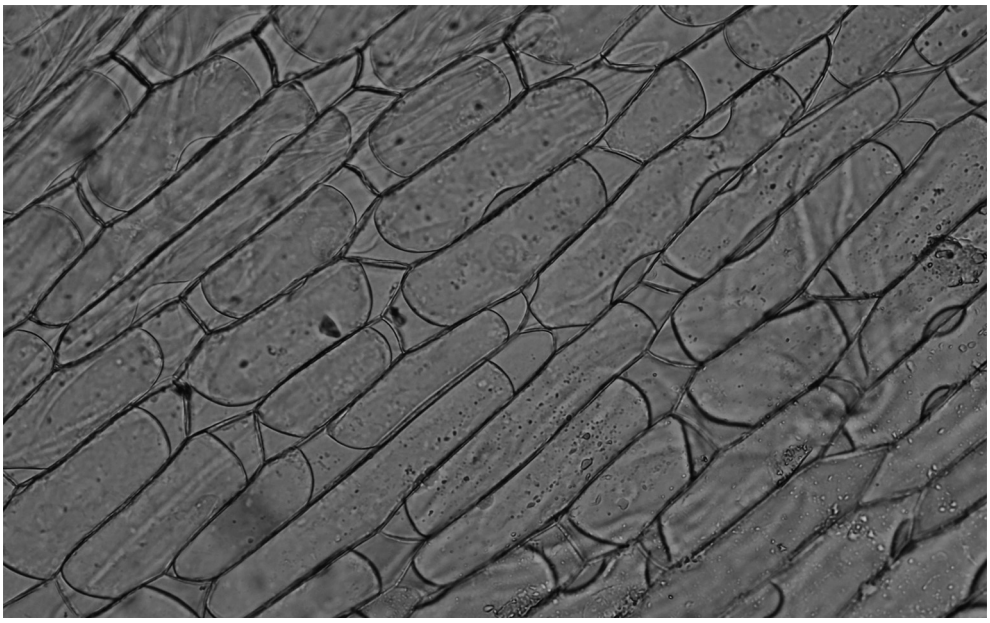

Fig. 2.3

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(b) **(i)** Describe the differences between the cells shown in Fig. 2.2 and Fig. 2.3.

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(ii) Explain what has happened to the cells in Fig. 2.3 to cause these differences.

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..... [4]

[Total: 11]

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

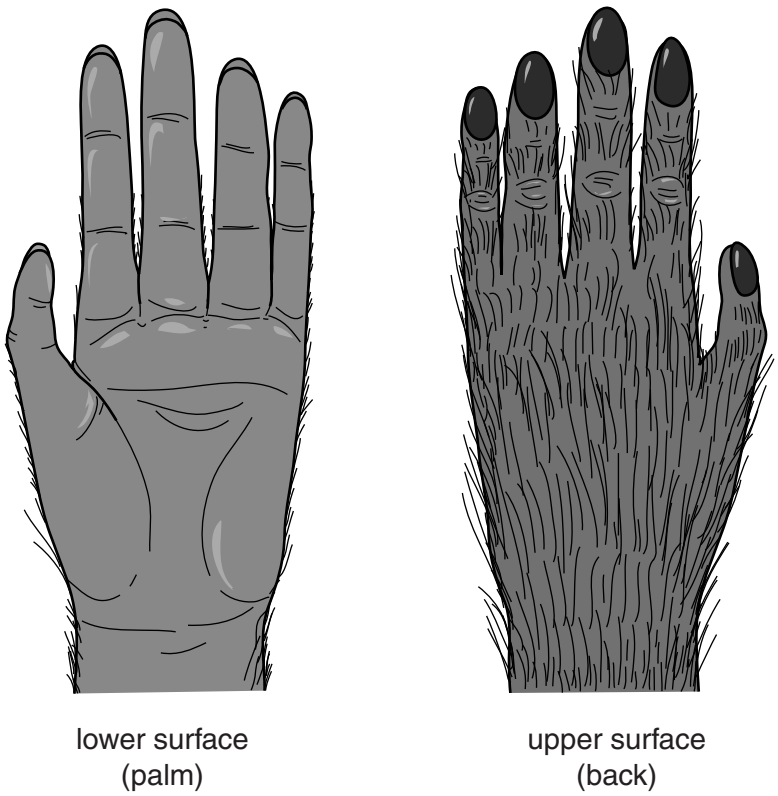

Fig. 3.1

- 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]

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

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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4 A nutritional drink contains reducing sugar and protein.

Describe how you would test this drink safely for the presence of reducing sugar and protein. Include a description of the test results you would expect.

(a) reducing sugar

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..... [5]

(b) protein.

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[Total: 8]

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