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 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 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 **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 **9** printed pages and **3** blank pages.

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1 Starch is broken down into reducing sugars by the enzyme amylase.

Iodine solution is used to test for the presence of starch. When no starch is present the yellow brown iodine solution does not change colour. If starch is present the iodine solution turns blue-black.

Some students investigated the effect of sodium chloride on the breakdown of starch by amylase.

They used three test-tubes, **A**, **B** and **C**, as shown in Fig. 1.1.

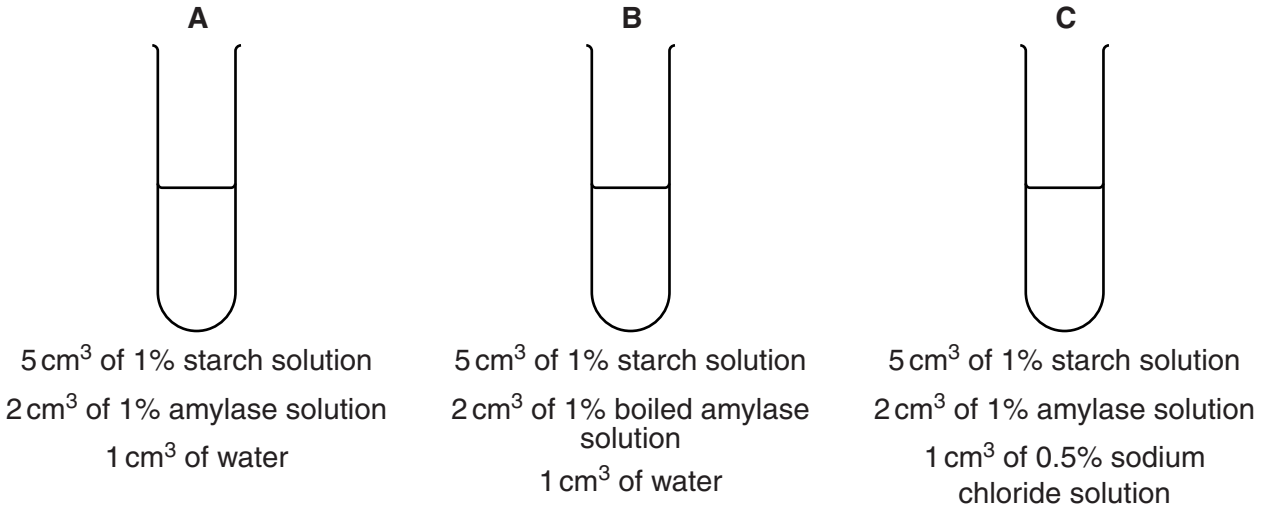


Fig. 1.1

The contents in each test-tube were stirred. A drop of each mixture was taken every minute and added to yellow brown iodine solution placed as drops on a white tile.

The students recorded the colour of the drops in Table 1.1.

Table 1.1

time / mins	test-tube **A**	test-tube **B**	test-tube **C**
0	black	black	black
1	black	black	dark brown
2	black	black	dark brown
3	dark brown	black	lighter brown
4	dark brown	black	lighter brown
5	dark brown	black	yellow brown
6	light brown	black	yellow brown
7	lighter brown	black	yellow brown
8	lighter brown	black	yellow brown
9	lighter brown	black	yellow brown
10	yellow brown	black	yellow brown

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(a) (i) State how long it took for the starch to be completely broken down in test-tubes **A** and **C**.

test-tube **A** ..... test-tube **C** ..... [2]

(ii) Describe the effect of sodium chloride on the breakdown of starch by amylase.

.....

.....

.....[2]

(b) Explain why the following procedures were carried out

(i) using a white tile,

.....[1]

(ii) stirring the contents of each test-tube,

.....[1]

(iii) 1 cm^3 of water was added to test-tubes **A** and **B**.

.....

.....[2]

(iv) 5 cm^3 of 1% starch was added to all of the test-tubes,

.....[1]

(v) using test-tube **B**.

.....[1]

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[Turn over

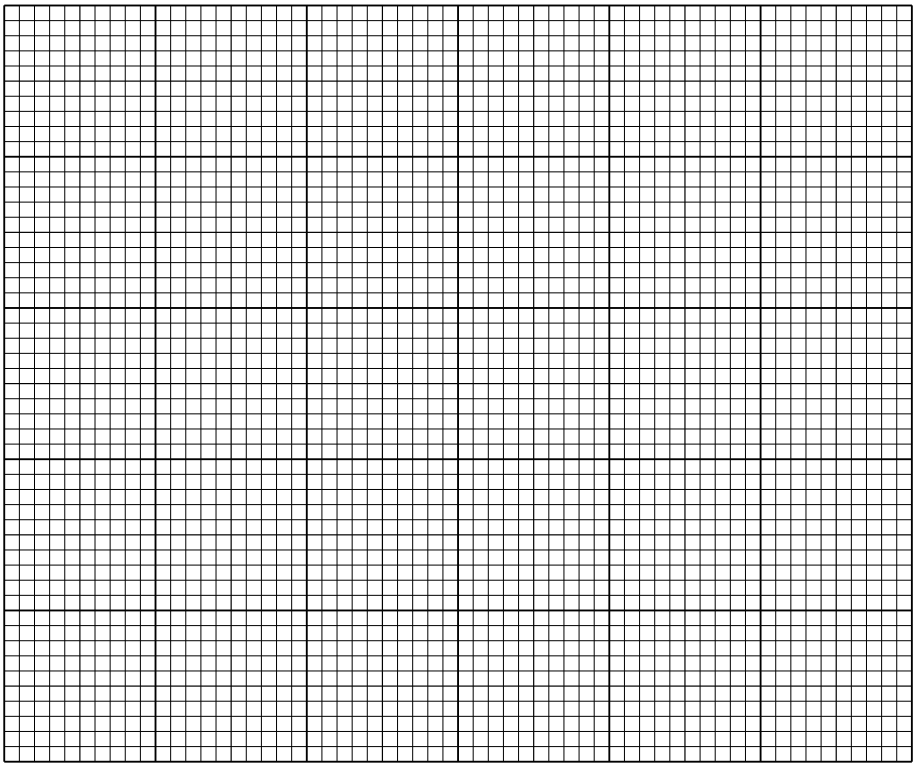
Some students carried out an investigation on the effect of pH on the activity of amylase. The results are shown in Table 1.2.

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Table 1.2

pH	time taken to break down starch / minutes
3	20
4	13
5	3
6	7
7	12
8	22

(c) (i) Using the data in Table 1.2 construct a graph to show the effect of pH on the time taken for the breakdown of starch.



[4]

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

.....[1]

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(iii) Describe and explain the effect of pH on the activity of this enzyme.

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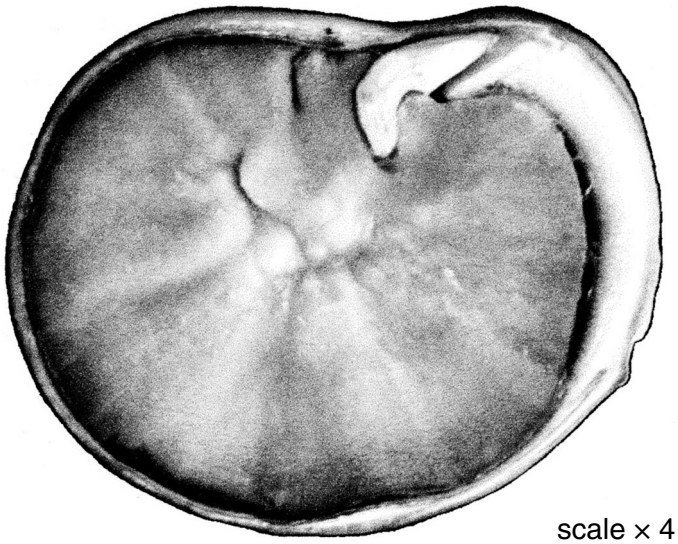
.....

.....[3]

[Total: 18]

2 Fig. 2.1 shows a fresh, soaked seed of broad bean, *Vicia faba*, which has been cut in half.

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scale × 4

Fig. 2.1

(a) (i) Make a large, labelled drawing of the seed as shown in Fig. 2.1.

[6]

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(ii) Draw a line on Fig. 2.1, to show the maximum length of the seed and measure this length.

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..... mm

Draw a line on your drawing to show the equivalent length of the seed and measure this length.

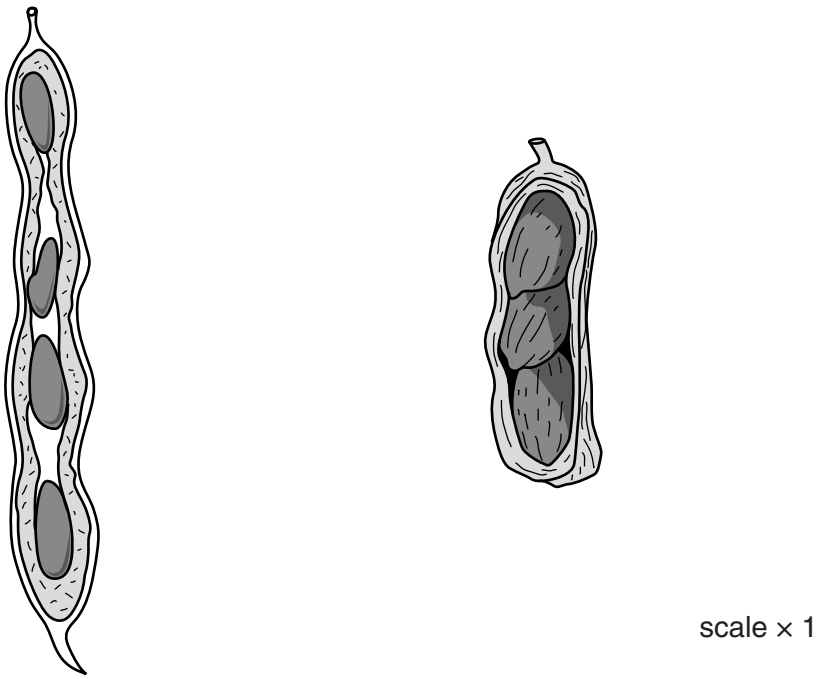
..... mm

Calculate the magnification of your drawing, compared to the actual size of the seed.

Show your working.

magnification ..... [4]

Fig. 2.2 shows sections of two bean fruits.



scale × 1

climbing bean groundnut

Fig. 2.2

(b) (i) Describe **three** ways in which the groundnut fruit is different from the climbing bean fruit.

1 .....

2 .....

3 .....[3]

All bean seeds contain substantial quantities of protein.

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(ii) Design an investigation to compare the protein content of the seeds from these two bean fruits.

.....

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.....[4]

[Total: 17]

3 Fig. 3.1 shows the bones in the human forearm and the leg.

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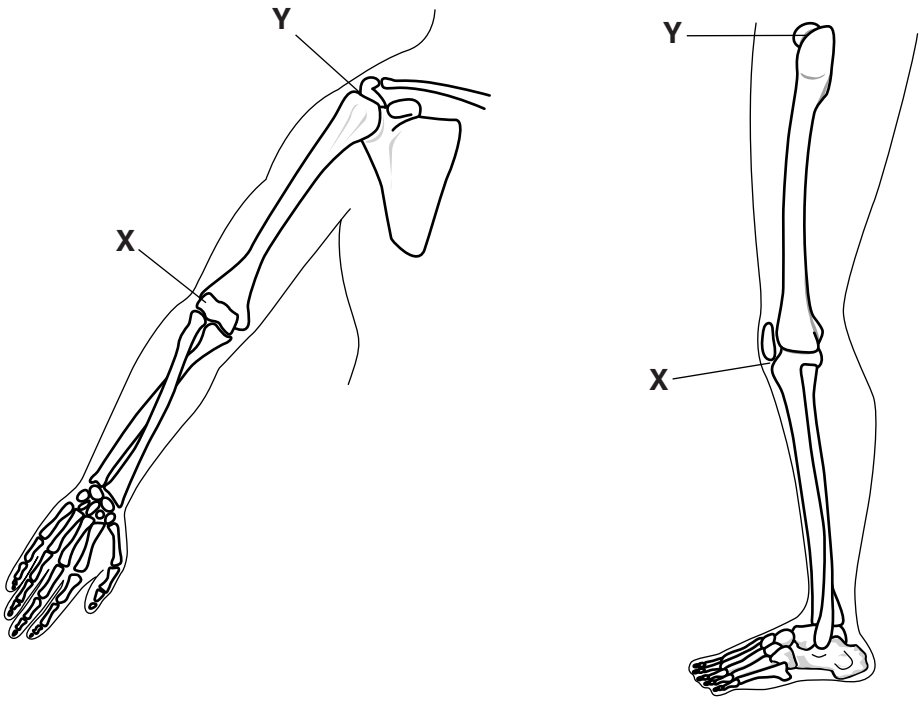


Fig. 3.1

(a) Describe how the arrangement of bones is similar in the forearm and the leg, excluding the joints.

.....

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.....

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.....

.....[3]

(b) Describe the movement that can be made at **X** and **Y**.

X .....

Y .....[2]

[Total: 5]

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