UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0566644839

BIOLOGY **5090/32**

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.

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1	
2	
3	
Total	

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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.

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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.

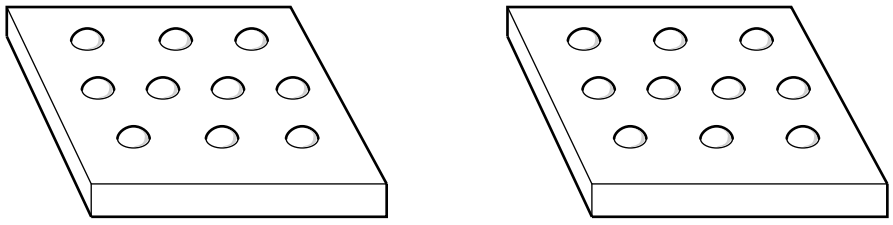
You are required to investigate the effect of sodium chloride on the breakdown of starch by amylase.

You are provided with

- two test-tubes each containing 5 cm^3 of 1% starch solution, labelled **A** and **B**,
- two test-tubes each containing 2 cm^3 of 1% amylase, labelled **A2** and **B2**,
- test-tube containing 1 cm^3 of water, labelled **water**,
- test-tube containing 1 cm^3 of 0.5% sodium chloride solution labelled **sodium chloride**,
- two dropping pipettes,
- Iodine solution,
- two white tiles.

Proceed as follows:

- Label one white tile, **A** and the other white tile, **B**.
- Add 10 separate drops of iodine solution to each tile, as shown in Fig. 1.1.



tile **A** tile **B**

Fig. 1.1

- To test-tube **A** add the 1 cm^3 water and the contents of **A2**.

  Record the time .....

- Carefully shake the mixture.
- After one minute remove a drop from this mixture and add it to the first drop of iodine solution on the white tile **A**.
- Record the colour in Table 1.1.
- Continue taking one drop from the mixture every minute, recording the colour until the yellow-brown iodine solution does not change colour.

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- To test-tube **B** add the 1 cm^3 of 0.5% sodium chloride solution and the contents of **B2**.

  Record the time .....

- Carefully shake the mixture.

- Repeat the procedure of taking one drop from this mixture, adding it to the iodine solution drops on the white tile **B**. Record the colours in Table 1.1 until the yellow-brown colour of the iodine solution does not change colour.

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(a) Time 0 minutes has been done for you.

Table 1.1

time / mins	test-tube **A**	test-tube **B**
0	blue-black	blue-black
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

[4]

(b) (i) Using your data in Table 1.1, state how long it took for the starch to be completely broken down in test-tubes **A** and **B**.

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

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

.....

.....

.....[2]

(c) Explain why the following procedures were carried out

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(i) 'use a white tile'

.....[1]

(ii) 'shake the mixture'

.....[1]

(iii) 'add the 1 cm^3 of water to test-tube **A**'

.....

.....[2]

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

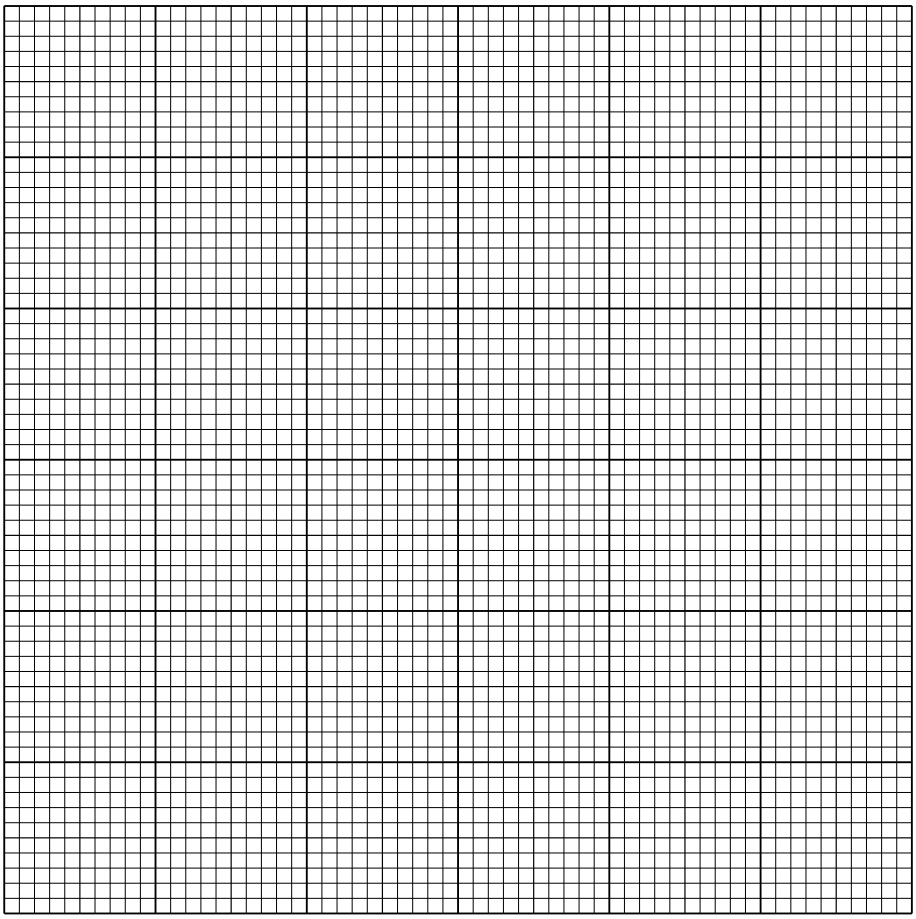
Table 1.2

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

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(d) (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.

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[4]

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

.....[1]

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

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.....[3]

[Total: 20]

2 You are provided with a fresh, soaked seed of broad bean, *Vicia faba*, labelled **W1**.

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- Carefully remove the testa (the seed coat).
- Carefully separate the cotyledons (the seed leaves).

Observe the structure of the embryo on one side of the cotyledon, examining the specimen using the hand lens provided.

(a) (i) Make a large, labelled drawing of the cotyledon with the embryo attached.

[6]

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(ii) Measure the length of the cotyledon.

length of cotyledon ..... mm

Measure the length of the cotyledon on your drawing.

length of cotyledon on your drawing ..... mm

Draw a line on your drawing to show where you have measured this length.

Calculate the magnification of your drawing.

Show your working.

magnification .....[3]

You are provided with two different types of bean fruits labelled **W2** and **W3**.

(b) (i) Describe **two** observable differences, apart from size, between **W2** and **W3**.

1 .....

2 .....[2]

All bean seeds contain substantial quantities of protein.

(ii) Design an investigation, but do not carry it out, to compare the protein content of the seeds from these two bean fruits **W2** and **W3**.

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.....[4]

[Total: 15]

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

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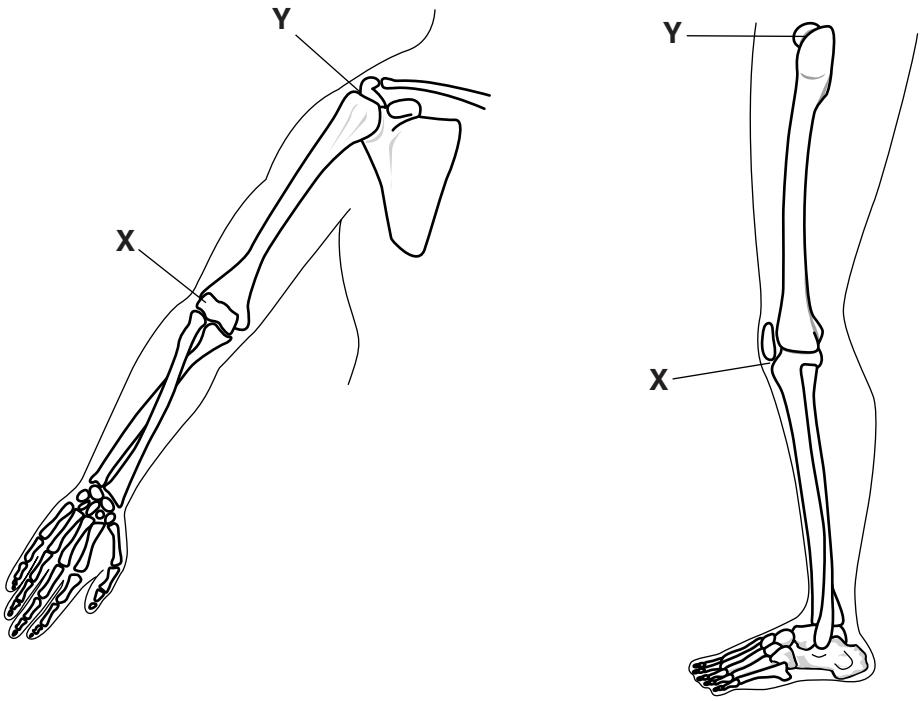


Fig. 3.1

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

.....

.....

.....

.....

.....

.....[3]

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

X .....

Y .....[2]

[Total: 5]

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