UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

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Biology **0610/53**

Paper 5 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 or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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 **11** printed pages and **1** blank page.

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Read through all the questions on this paper carefully before starting work.

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1 Milk is the main food for young mammals and contains all the required nutrients for the first part of life. Milk needs to clot before it can be digested.

The stomach of a young mammal produces an enzyme which causes some soluble proteins in milk to form insoluble clots.

You will carry out an investigation on this clotting process.

You are supplied with fresh milk, labelled **milk**.

You are also supplied with the enzyme, labelled **enzyme**.

Carry out your investigation as follows:

- Take a clean test-tube and label it **1**.
- Measure 5 cm^3 of milk into the test-tube. Stand the test-tube in the container of water at 40 °C.

When a mixture of milk and the enzyme solution is gently rotated in a test-tube, clotting goes through the stages shown in Fig. 1.1 and Fig. 1.2.

Stage **C** is the point at which you should record the time that the reaction has finished.

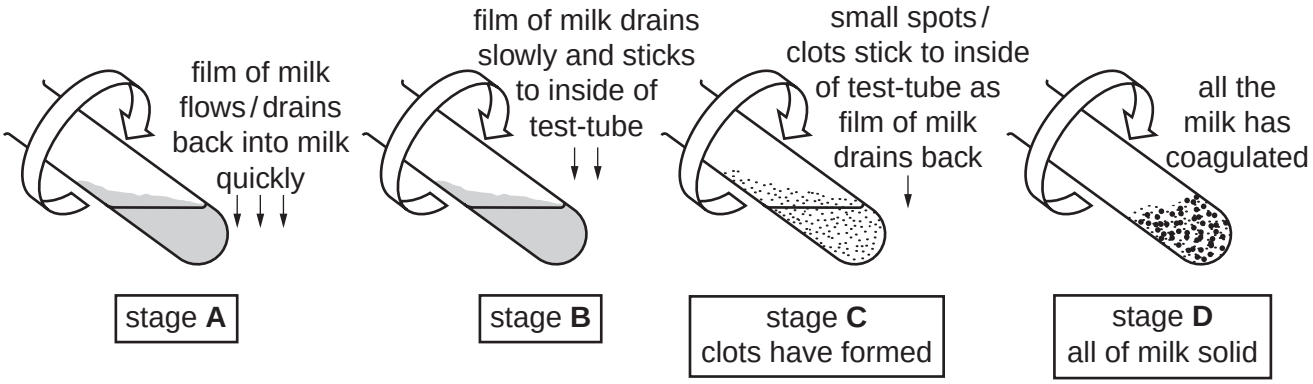


Fig. 1.1

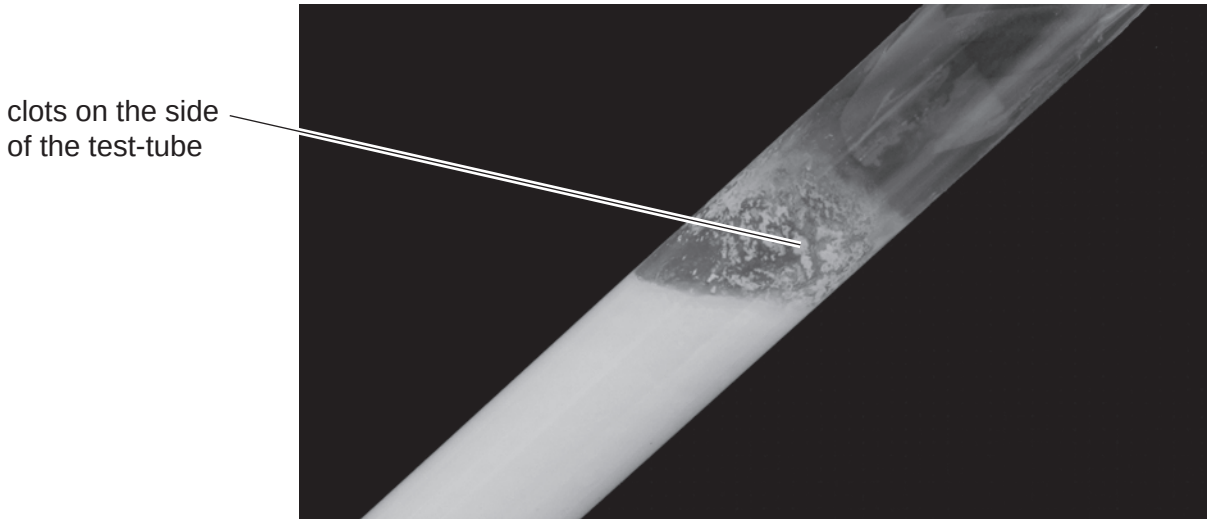


Fig. 1.2

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(a) (i) Add 1 cm^3 of the enzyme solution to the milk in test-tube **1** and shake the test-tube carefully.

- Start timing and gently rotate the test-tube as shown in Fig. 1.1 to form a film of milk on the inside of the test-tube.
- Keep rotating the test-tube until stage **C** is reached, as shown in Fig. 1.1 and Fig. 1.2, and record the time that was taken for clots to form.

  Write the time taken for clots to form in Table 1.1. [1]
- Leave the clotted milk in test-tube **1** as you will need it later.

Table 1.1

test-tube	time taken for clots to form using fresh milk / seconds
1	.....
2	.....
3	.....

(ii) Repeat this procedure with test-tubes labelled **2** and **3**. Use fresh milk and enzyme solution each time.

For test-tube **2** and test-tube **3**, record the time taken for clots to form in Table 1.1. [2]

(iii)

- Filter the clotted milk from test-tube **1** into a clean test-tube through the apparatus provided. This separates the clots from the liquid. Leave this to filter and move onto parts **(b)** and **(c)** whilst you wait. You will need both the clots and the separated liquid for part **(e).**

Suggest **and** explain why this procedure was carried out three times.

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..... [2]

A similar experiment was carried out using dried milk mixed with water. The results are shown in Table 1.2.

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Table 1.2

test-tube	time taken for clots to form using dried milk / seconds
1	210
2	160
3	200

(b) Describe **and** explain the results for the time taken to form clots using fresh milk in Table 1.1 and dried milk in Table 1.2.

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..... [3]

(c) Suggest **and** explain why the test-tubes were placed in a container of water at 40 °C.

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..... [2]

(d) (i) State one source of error in the **method** of this investigation.

..... [1]

(ii) Suggest how to improve the method to reduce the error stated in **(d)(i).**

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..... [1]

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(e) Now you are going to use both the clots and the liquid which you separated by filtering the milk that was in test-tube 1.

(i) Describe how you will safely carry out a test to compare the protein content of the clots with that of the liquid.

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..... [4]

- Test the protein content of the clots by using a suitable reagent.
- Test the protein content of the liquid using the same reagent.

(ii) Describe your observations and give your conclusions in Table 1.3.

Table 1.3

	clots	liquid
observations	....	....
conclusions	....	....

[4]

[Total: 20]

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2 You are provided with part of a plant organ labelled **Y**.

- Remove the covering from **Y**.

(a) (i) Use the hand lens to examine the **cut surface** of **Y**.
Make a large, labelled drawing of the **cut surface** of **Y**.

[4]

(ii) Suggest **two** biological functions of **Y** for the plant.

1 .....

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2 .....

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[2]

- Remove, by cutting, a small piece of the central part of **Y**.
- Place it on the tile.
- Carefully add a few drops of iodine solution to the small piece of **Y**.

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(b) Describe **and** explain your observations.

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..... [2]

[Total: 8]

Question 3 begins on page 8.

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3 Flies lay eggs which hatch into maggots. An investigation was carried out on the respiration rate of maggots.

Fig. 3.1 shows some living maggots in a large test-tube.

The apparatus was left to settle with the clip open.

The clip was then closed and a drop of coloured liquid was introduced into the open end of the capillary tube.

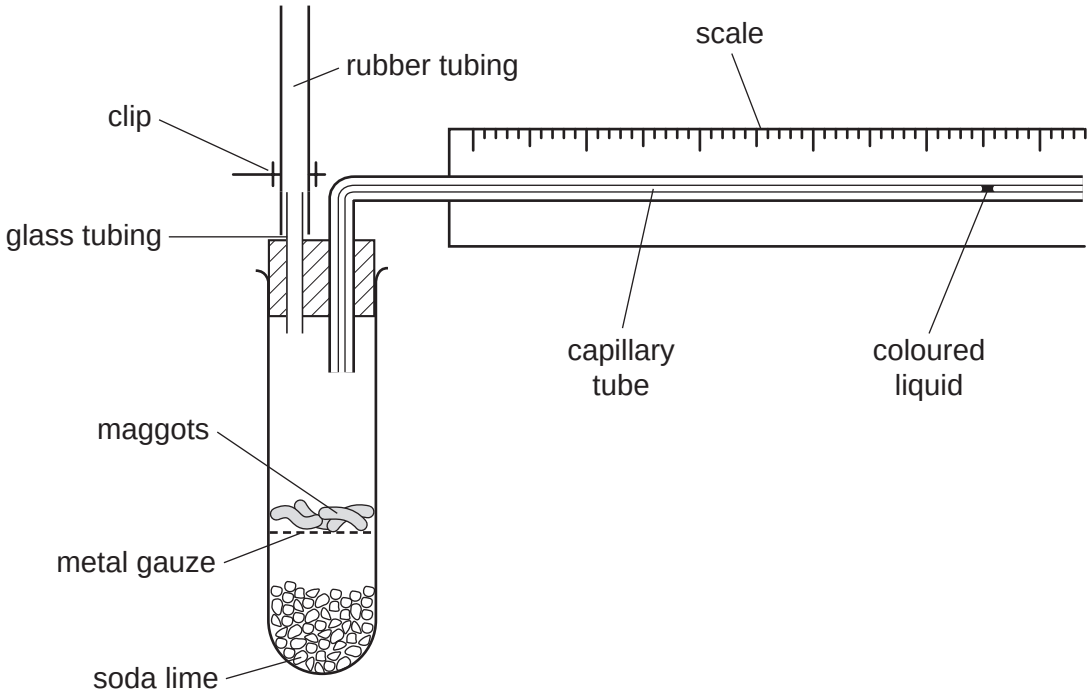


Fig. 3.1

Soda lime absorbs carbon dioxide.

During the investigation, the drop of coloured liquid moved along the capillary tube **towards** the test-tube.

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(a) Explain why the drop of coloured liquid moved towards the test-tube.

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..... [4]

Question 3 continues on page 10.

Some students carried out a similar investigation with another sample of maggots to find the effect of temperature on this process.

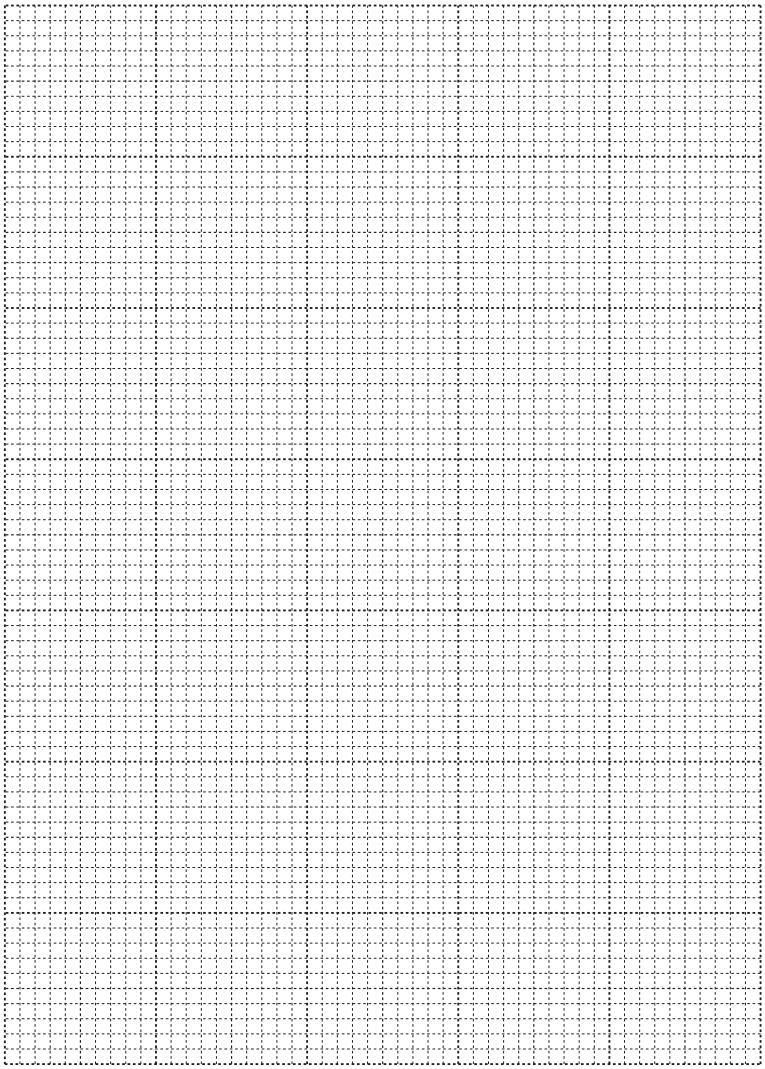
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The distance moved by the drop of coloured liquid was measured after one minute at each temperature as shown in Table 3.1.

Table 3.1

temperature / °C	15	20	25	30	35	40
distance moved by drop / mm	20	40	55	80	120	105

(b) Plot the data in Table 3.1 to show the effect of temperature on the distance moved by the drop of coloured liquid.



[4]

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(c) Describe the results shown on the graph.

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..... [3]

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(d) Suggest a suitable control for this investigation.

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..... [1]

[Total: 12]

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