



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

CANDIDATE  
NAME

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NUMBER

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**Biology**

**0610/51**

Paper 5 Practical Test

**May/June 2011**

**1 hour**

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 **both** 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	
<b>1</b>	
<b>2</b>	
<b>Total</b>	

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



**1** Amylase is an enzyme that breaks down starch.

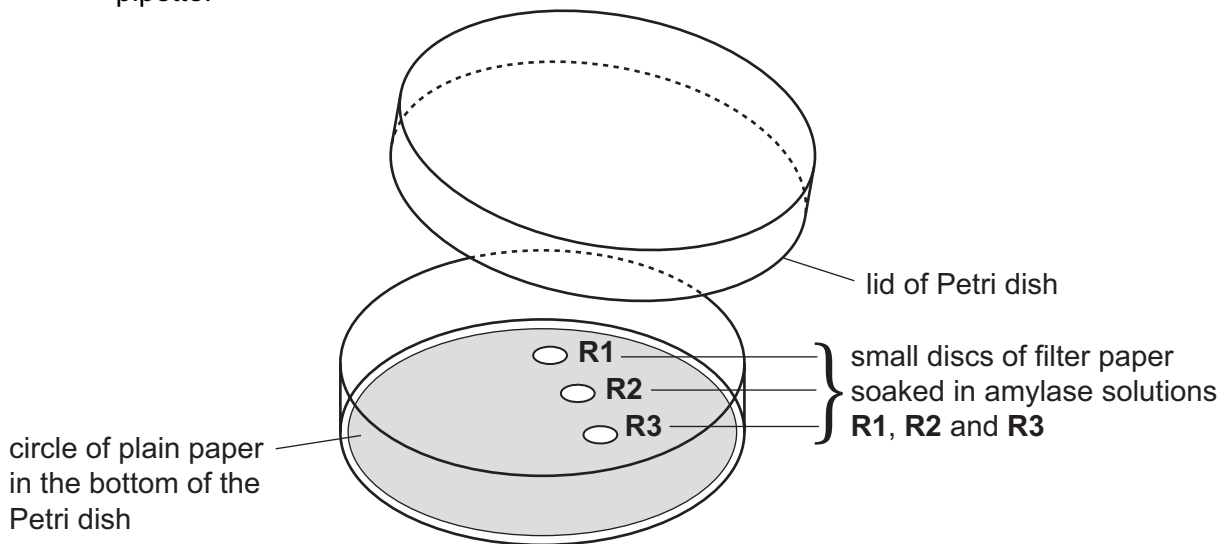
You are provided with three different concentrations of amylase solution, labelled **R1**, **R2** and **R3**.

You are going to test the activity of these solutions on plain paper.

**Read all the instructions before you begin work.**

*Proceed as follows:*

- Take three small discs of filter paper. Place one disc into each of the solutions **R1**, **R2** and **R3**.
- Cut out one circle from the sheet of plain paper. The paper should just fit into the bottom of the Petri dish as shown in Fig. 1.1.
- Add enough water to wet the paper. Pour away any excess water.
- Cover the wet paper with iodine solution so that it is evenly stained.
- Pour away any excess iodine solution and rinse the paper with water using the dropping pipette.



**Fig. 1.1**

- Using forceps, remove the small disc of filter paper from solution **R1** and place it carefully on the paper you have stained, as shown in Fig. 1.1.
- Using the forceps, gently press the disc of filter paper onto the surface of the stained paper.
- Repeat the procedure with the discs of filter paper from solutions **R2** and **R3** as shown in Fig. 1.1.
- Put the lid on the Petri dish. Note the time. Leave the three discs in the Petri dish for 10 minutes.

**During the 10 minutes you should prepare a table in which to record your observations, in the space in question 1(a). You may also start answering question 2.**

- Remove the lid from the Petri dish.
- Using forceps, gently lift each disc of filter paper out of the Petri dish, taking care not to tear the stained paper underneath.
- Look carefully at the stained paper.

**(a)** Record your observations in the table that you have prepared.

[5]

**(b)** Explain the observations that you have recorded for the three different concentrations of amylase.

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[3]

(c) Students wanted to find out the effect of different pH values on amylase activity.

Describe how you would change the experiment you carried out in part (a) so that you could investigate the effect of pH. Do **not** carry this out.

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[4]

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**Question 1 continues on page 6**

- (d) Students investigated samples of amylase from 100 goats.

100 small filter paper discs were each soaked with a different sample of goat amylase.

The discs were placed on iodine stained plain paper.

The students lifted the filter paper discs at one-minute intervals and recorded the number of areas where there had been a reaction.

If there had been no reaction they replaced the disc of filter paper for another minute. This procedure was repeated for five minutes.

Their results are recorded in Table 1.1.

**Table 1.1**

time / minutes	number of <b>new</b> areas where there had been a reaction	<b>total</b> number of areas where there had been a reaction
1	14	14
2	28	42
3	18	60
4	12	.....
5	6	.....

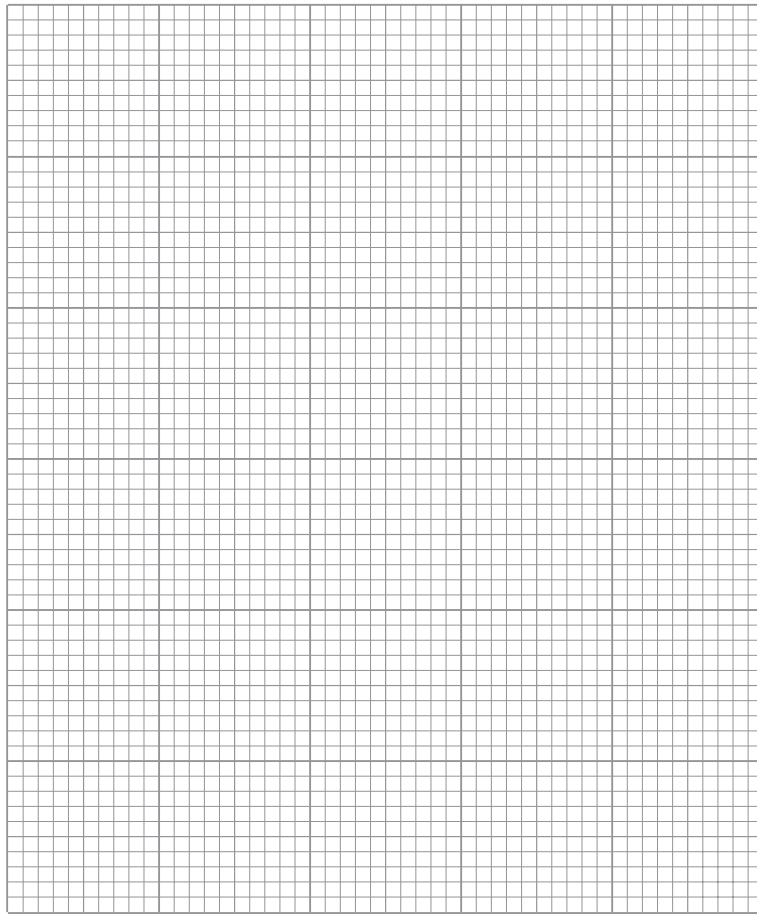
- (i) Complete Table 1.1 by calculating the total number of areas where there had been a reaction after 4 and 5 minutes.

Write your answers in the spaces in Table 1.1.

Show your working in the space below.

[2]

(ii) Plot the data from the **first two columns** in Table 1.1, to show the variation in the activity of amylase.



[5]

(iii) Suggest **two** reasons for the variation in amylase activity of the samples.

.....  
.....  
.....  
..... [2]

(e) Suggest **three** ways in which you could improve this investigation.

1. ....  
.....  
2. ....  
.....  
3. ....  
..... [3]

[Total: 24]

2 Fig. 2.1 is a photograph of a dandelion fruit.



**Fig. 2.1**

**(a)** Make a large drawing of the fruit in the space below.

Add labels on your drawing to show:

- where the fruit was attached to the plant,
- the position of the seed.

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[5]



- (b) (i) Measure the length of the fruit in Fig. 2.1 and draw a straight line next to your drawing to show this length.

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*length of fruit in Fig. 2.1* .....

*length of fruit in your drawing* ..... [2]

- (ii) Calculate the magnification of your drawing.

Show your working.

magnification ..... [2]

(c) Fig. 2.2 shows a fruit which has been kept in a **dry** environment for one day.

Fig. 2.3 shows a fruit which has been kept in a **damp** environment for one day.

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Fig. 2.2



Fig. 2.3

(i) Complete the table to show one visible difference between the two dandelion fruits.

feature	dry fruit shown in Fig. 2.2	damp fruit shown in Fig. 2.3
.....	..... .....	..... .....

[2]

(ii) Suggest and explain how changing weather conditions would:

- help disperse the fruits away from the parent plant,
- allow them to germinate in a new habitat.

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..... [5]

[Total: 16]

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*Copyright Acknowledgements:*

Question 2a Figure 2.1

© dandelion taraxacum officinale studio; Dirk v. Mallinckrodt / Alamy.

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