



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

CANDIDATE  
NAME

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NUMBER

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NUMBER

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**BIOLOGY**

**0610/61**

Paper 6 Alternative to Practical

**May/June 2011**

**1 hour**

Candidates answer on the Question Paper

Additional Materials: ruler

**SUITABLE FOR HEARING IMPAIRED CANDIDATES.**

**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.

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>3</b>	
<b>Total</b>	

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



**BLANK PAGE**

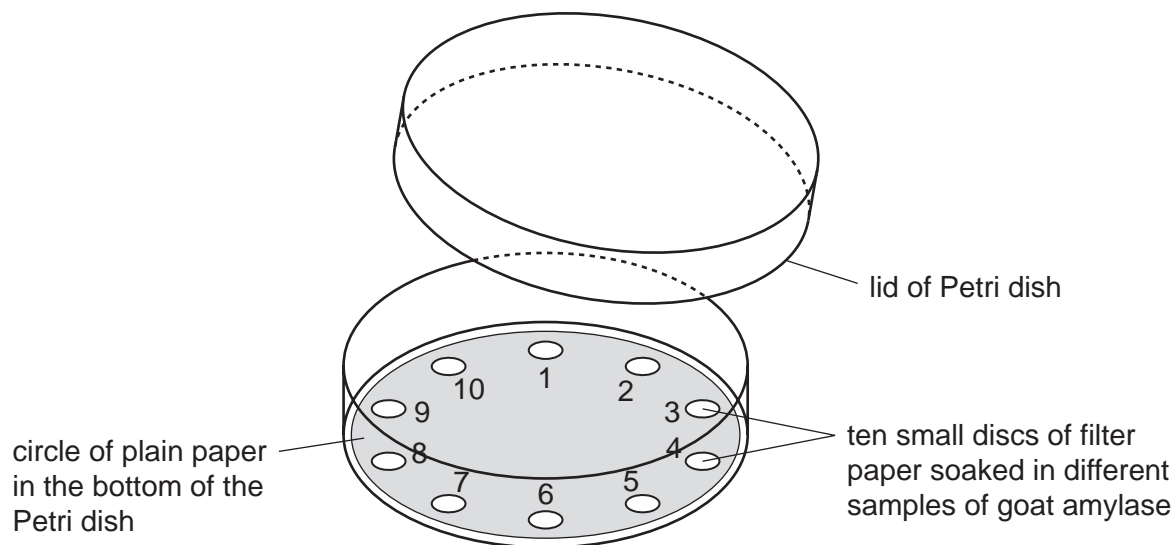
- 1 Students investigated samples of amylase from 100 goats. 100 small filter paper discs were each soaked in a different sample of goat amylase. The students tested the activity of these amylase samples using plain paper. Plain paper contains starch.

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A circle of plain paper was placed into a Petri dish as shown in Fig. 1.1. Iodine solution was used to stain the starch in the plain paper.

- (a) When iodine solution reacts with the starch in the plain paper, what colour would you see?

..... [1]



**Fig. 1.1**

Ten amylase soaked filter paper discs were placed into one of the Petri dishes as shown in Fig. 1.1.

Ten Petri dishes were set up as in Fig. 1.1.

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

- (b) How would the students know that a reaction had taken place?

..... [1]

## 4

If a reaction had not taken place, the students replaced the disc of filter paper for another minute. This procedure was repeated for five minutes.

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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	.....

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

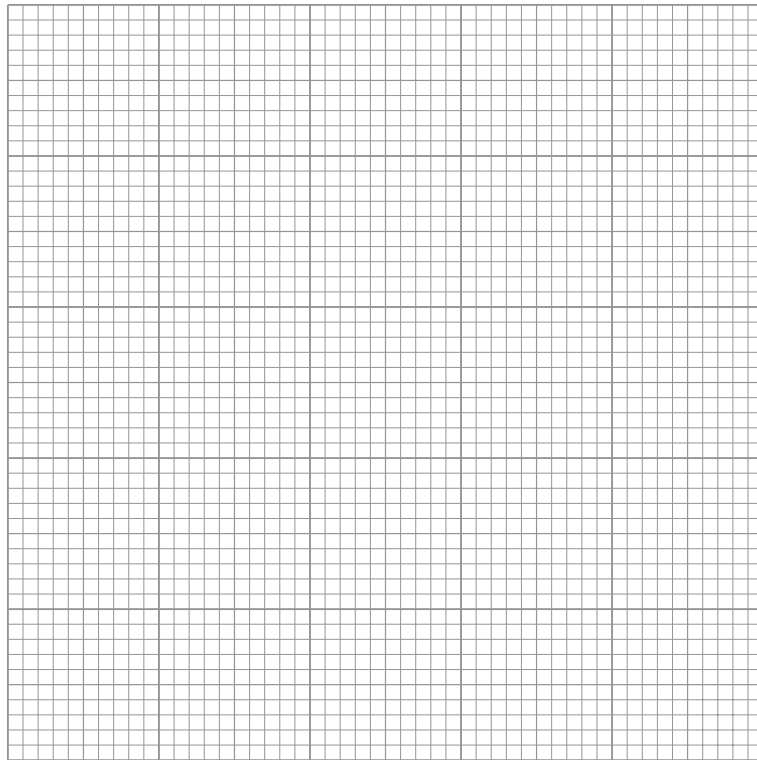
Write your answers in the spaces in Table 1.1.

Show your working in the space below.

[2]

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

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[5]

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

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

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

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

[Total: 14]

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 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.

*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]

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(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 below 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
<p>.....</p>	<p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p>

[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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Use*

.....

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.....

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[5]

[Total: 16]

3 Fig. 3.1 shows sections through ginger (*Zingiber officinale*) and lotus (*Nelumbo nucifera*) stems.

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ginger



lotus

Fig. 3.1

(a) (i) State one **visible** similarity between the two stems.

..... [1]

(ii) Complete Table 3.1 to show three **visible** differences between the two stems.

Table 3.1

difference	stem	
	ginger	lotus
1	..... .....	..... .....
2	..... .....	..... .....
3	..... .....	..... .....

[3]

**(b)** Lotus plants live in water.

Suggest and explain an adaptation of the lotus stem to its water habitat.

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

**(c)** The cells of lotus roots contain starch grains.

Describe how you would prepare a microscope slide of the cells of a lotus stem to show the starch grains.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
..... [4]

[Total: 10]

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*Copyright Acknowledgements:*

Question 2a Figure 2.1 © dandelion taraxacum officinale studio; Dirk v. Mallinckrodt / Alamy.

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