UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **May/June 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 spaces 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.

For Examiner's Use	
1	
2	
3	
Total	

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

1 Bread is made from dough composed of flour, water and active yeast.

Some students carried out an investigation into two different types of flour, **A** and **B**, used in bread-making.

Two portions of dough were made, one using flour **A** and the other, flour **B**. For each dough, the same mass of flour, yeast and volume of water was used. A sample of each dough was placed in a measuring cylinder. The surface of the dough was smoothed and this original volume marked on the cylinder. The measuring cylinders were left for 30 minutes at a temperature of 25 °C after which the volume of the dough was again marked, as shown in Fig. 1.1.

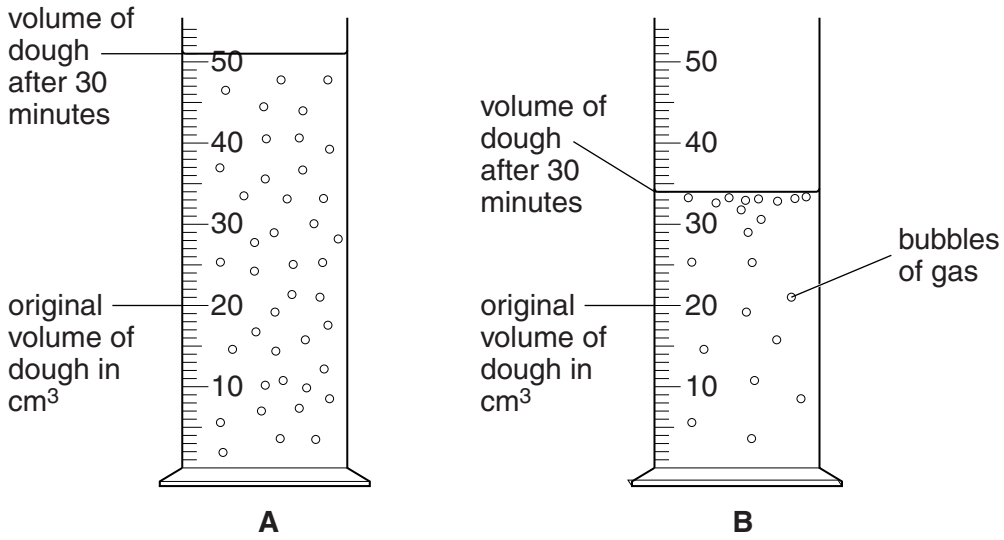

Fig. 1.1

(a) Complete Table 1.1.

Table 1.1

	volume of dough / cm^3	
	A	**B**
initial volume		
final volume after 30 minutes		
change in volume		

[3]

(b) (i) Describe any differences in the two dough mixtures **A** and **B** after 30 minutes.

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.....[2]

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(ii) Explain how the metabolic processes of the active yeast have brought about the change in dough **A**.

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.....[3]

(c) Describe how you would carry out an investigation into the effect of temperature on the activity of the yeast in dough made with flour **A**.

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.....[5]

[Total: 13]

2 Fig. 2.1 is a photograph showing the upper surface of one green leaf.

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Fig. 2.1

(a) Make a large, labelled drawing of this leaf.

[6]

(b) Describe how this leaf is suited to its functions.

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.....[3]

Fig. 2.2 shows a specialised leaf modified to trap insects.

Fig. 2.2

(c) (i) Using information shown in Fig. 2.2, suggest how the leaf is modified to trap the insects.

.....

.....[1]

Such plants live in soils which are low in mineral ions and add to their nutrient intake by digesting the trapped insects.

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(ii) Suggest **one** important mineral ion these plants might gain from the insects after digesting and absorbing them.

.....[1]

(iii) Describe how this ion may be used in the plant.

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.....[1]

[Total: 12]

3 Fig. 3.1 shows a mature flower of Lily, *Lilium* species.

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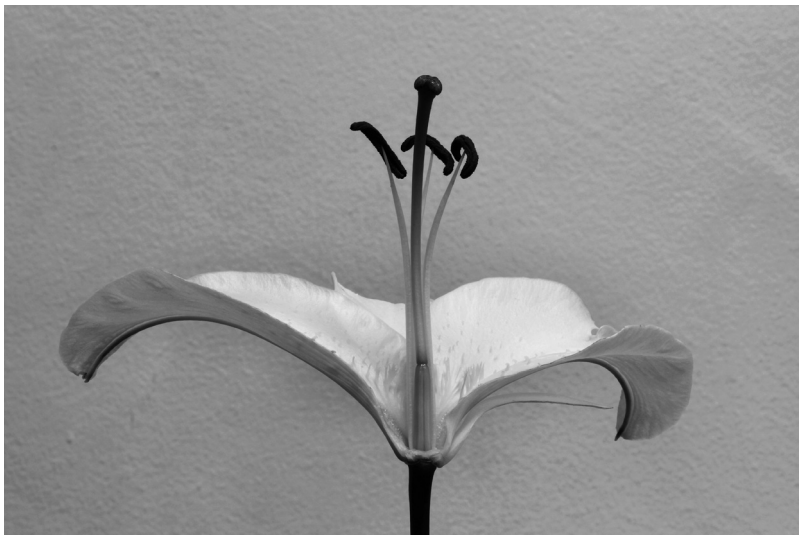

Fig. 3.1

(a) On Fig. 3.1, identify with a clear labelling line and its name:

(i) a structure that produces pollen, [1]

(ii) a structure on which pollen lands during pollination. [1]

After landing on the structure identified in **(a)(ii)**, pollen grains germinate. As they do not contain stored nutrients for growth, they obtain them from surrounding tissues.

(b) Describe how you might safely carry out a food test to show that these tissues contain **reducing sugar**.

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.....[5]

Pollen grains were grown in nutrient solution on microscope slides. Fig. 3.2 shows diagrammatically the growth of pollen tubes with time.

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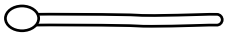
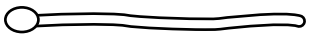
time / hours	
0.0	
2.0	
4.0	
6.0	
8.0	
10.0	

Fig. 3.2

(c) (i) Measure the lengths of the pollen tubes shown in Fig. 3.2, and record them in Table 3.1.

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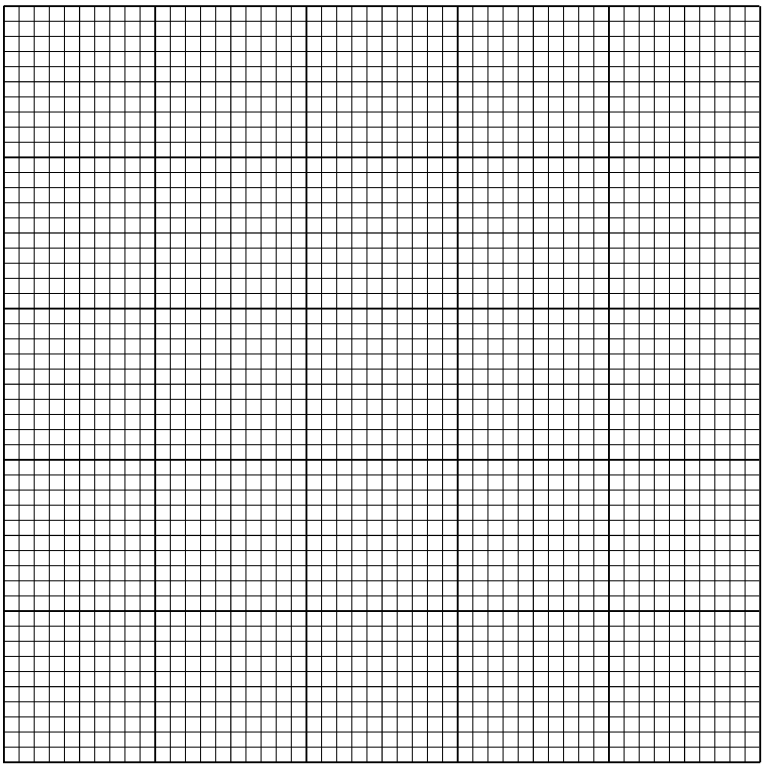
Table 3.1

time / hours	length / mm
0.0	0
2.0	
4.0	
6.0	
8.0	
10.0	

[2]

(ii) Construct a graph of the data in Table 3.1.



[4]

(iii) Describe the trend shown in the growth of the pollen tubes.

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.....[1]

(d) Suggest how these pollen tubes are able to grow through the plant tissue in the correct direction towards the ovule.

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.....

.....[1]

[Total: 15]

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