UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

8888698613

BIOLOGY **5090/31**

Paper 3 Practical Test **May/June 2012**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As specified 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 ink.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use red ink, 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 **8** printed pages and **4** blank pages.

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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 work.

For Examiner's Use

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

You are required to investigate the action of active yeast in 30 g of each of two different types of flour, **S1** and **S2**.

- Carefully add flour **S1** to the beaker, labelled **S1**, containing active yeast, and stir until thoroughly mixed to make the dough.
- Level the top of the dough as much as possible by using the stirrer. Using a marker pen or label, mark this level on the outside of the beaker.
- Use the ruler to measure the height of the dough and record your measurement in Table 1.1 as the initial height.
- Record the start time in Table 1.1 and leave the beaker on the bench for **30 minutes**.
- Clean the stirrer.
- Repeat the above procedure using flour **S2** and the second sample of active yeast in the beaker, labelled **S2**. Record the initial height and the start time in Table 1.1.

While you are waiting you should continue with the other questions.

- After leaving each dough for 30 minutes, record the finish times in Table 1.1 for **S1** and **S2**. Measure the maximum height of the dough in each beaker and record this in Table 1.1 as the final height.

(a) Complete Table 1.1 by calculating the durations and changes in height for **S1** and **S2**.

Table 1.1

time			**height of dough/mm**		
	S1	**S2**		**S1**	**S2**
at start			initial height		
at finish			final height		
duration/mins			change in height		

[4]

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

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.....[3]

(ii) Describe and explain how the metabolic processes of the active yeast have brought about the changes that you have observed.

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.....[3]

(c) Describe how you would carry out an investigation into the effect of temperature on the activity of yeast in dough made with flour **S1**.

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.....[5]

[Total: 15]

2 You are provided with part of a plant, **S3**.

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(a) Make a large, labelled drawing of **S3**.

[5]

(b) Describe how **S3** is suited to its functions.

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.....

.....[3]

Fig. 2.1 shows a specialised leaf modified to trap insects.

For Examiner's Use



Fig. 2.1

(c) Using information shown in Fig. 2.1, suggest how the leaf is modified to trap the insects.

.....

.....[1]

Such plants live in soil low in mineral ions and add to their mineral intake by digesting the trapped insects.

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

.....[1]

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

.....

.....[1]

[Total: 11]

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3 You are provided with a mature flower, **S4**.

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- Remove the petals.
- Observe the remaining structures of the flower.

(a) Draw and label

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

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

Drawing (a)(i) **Drawing (a)(ii)**

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.

- Remove this central structure from the flower.

(b) **(i)** Describe how you might safely carry out a food test to show that this structure contains **reducing sugar**.

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.....[4]

- Carry out this test using the central structure removed from the flower.

(ii) Record your observations.

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.....[1]

Pollen grains were grown in nutrient solution on microscope slides. Fig. 3.1 shows diagrammatically the growth of pollen tubes with time.

For Examiner's Use

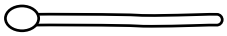
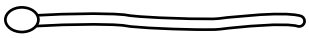
time / hours	
0.0	
2.0	
4.0	
6.0	
8.0	
10.0	

Fig. 3.1

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

Table 3.1

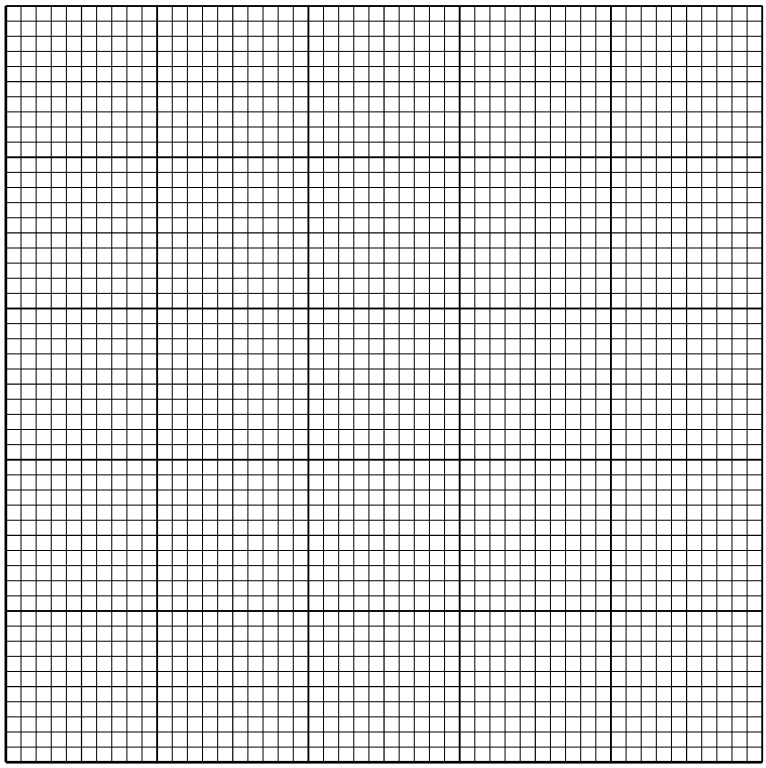
time / hours	length / mm
0.0	0
2.0	
4.0	
6.0	
8.0	
10.0	

[2]

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

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[3]

(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: 14]

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