UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

5616419248

BIOLOGY **5090/32**

Paper 3 Practical Test **October/November 2013**

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, 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.

Electronic calculators may be used.

For Examiner's Use	
1	
2	
3	
Total	

This document consists of **11** printed pages and **1** blank page.

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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 You are going to investigate the effect of two sugars on the activity of yeast.
Solution **A** is 10 cm^3 of 10% glucose in water.
Solution **B** is 10 cm^3 of 10% sucrose in water.

The activity of the yeast will be measured by counting the number of bubbles of gas that are released from an open tube placed below the water surface in a beaker of water.

- Take one small packet containing 3 g of dried yeast. Empty the contents into the test-tube containing solution **A**.
- Carefully shake the test-tube and place it into the large beaker of **warm** water provided.
- After approximately 5 minutes, when the mixture begins to froth, attach the bung with the delivery tube.
- Insert the open end of the delivery tube into the small beaker of water provided.

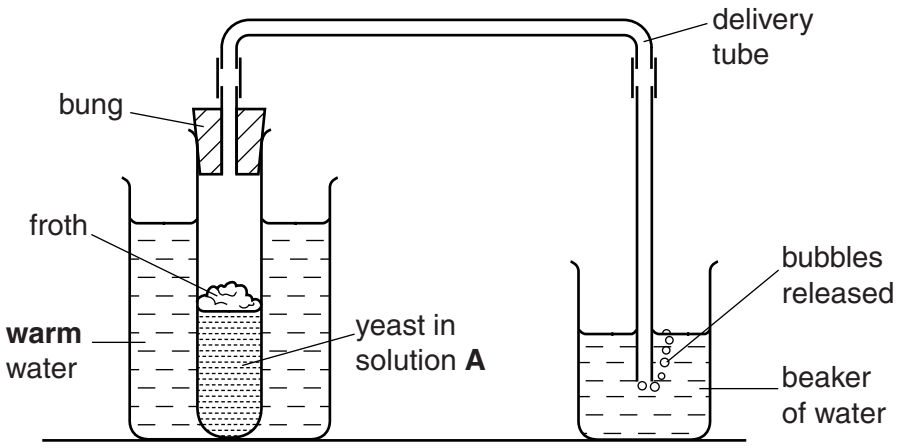


Fig. 1.1

- Count the number of bubbles released from the open end of the tube in one minute, and record your first count in Table 1.1.
- Shake the test-tube containing the active yeast mixture gently, and then count the number of bubbles released for a further minute. Record this second count in Table 1.1.
- Repeat the whole procedure with the second packet of yeast and solution **B**.

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(a) (i)

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Table 1.1

solution	number of bubbles of gas released in one minute	
	first count	second count
A glucose in water		
B sucrose in water		

[2]

(ii) Describe what your results show about the effect of glucose and sucrose on the activity of yeast.

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..... [2]

(b) (i) State the name of the gas that was released to form the bubbles.

..... [1]

(ii) Describe a simple test for the gas you have named.

.....

..... [2]

(iii) State the name of the process that was taking place in the yeast to produce this gas.

..... [1]

(c) (i) Suggest why the test-tubes were shaken between the two counts for each solution.

.....

..... [1]

(ii) List the factors that were kept constant during this investigation.

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.....[3]

Fig. 1.2 shows a yeast cell dividing.

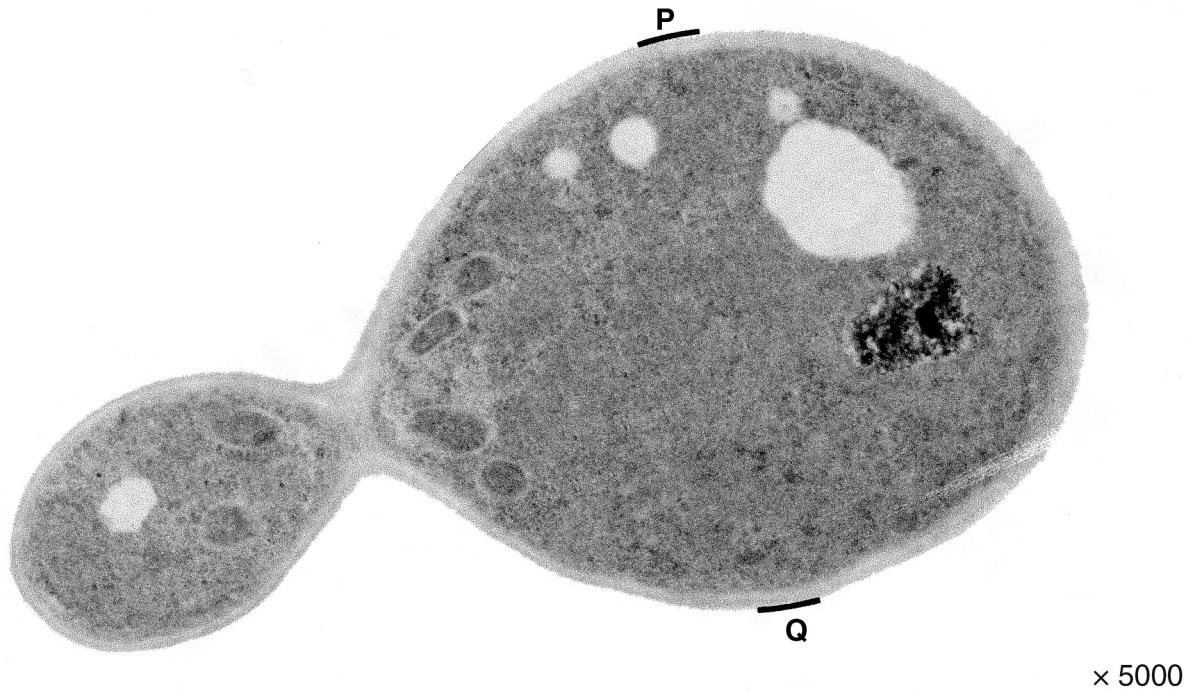


Fig. 1.2

(d) (i) Make a drawing of the yeast cell dividing shown in Fig. 1.2.

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[4]

(ii) On Fig. 1.2, draw a line between the letters **P** and **Q**.

Measure and record this length .....mm

On your drawing, draw a line similar to the line **PQ**.

Measure and record this length .....mm

Calculate the magnification of your drawing compared to the actual size of the cell.

Show your working.

magnification × ..... [5]

[Total: 21]

For Examiner's Use

2 You are provided with a solution **C**, prepared from seeds soaked in water, ground up and filtered.

You are provided with 'starch paper' in a Petri dish.

- Pour water onto this starch paper inside the Petri dish and drain away the excess.
- Add the dilute iodine solution to the wet starch paper so that it is evenly stained.
- Add water to the Petri dish and pour away all the liquid leaving the starch paper just damp.
- Remove three small discs of filter paper from the container, labelled '**filter paper discs**' and place into solution **C**.
- Using forceps carefully lift the three soaked filter paper discs from solution **C** and place them on the starch paper stained with iodine solution in the Petri dish, as shown in Fig. 2.1.

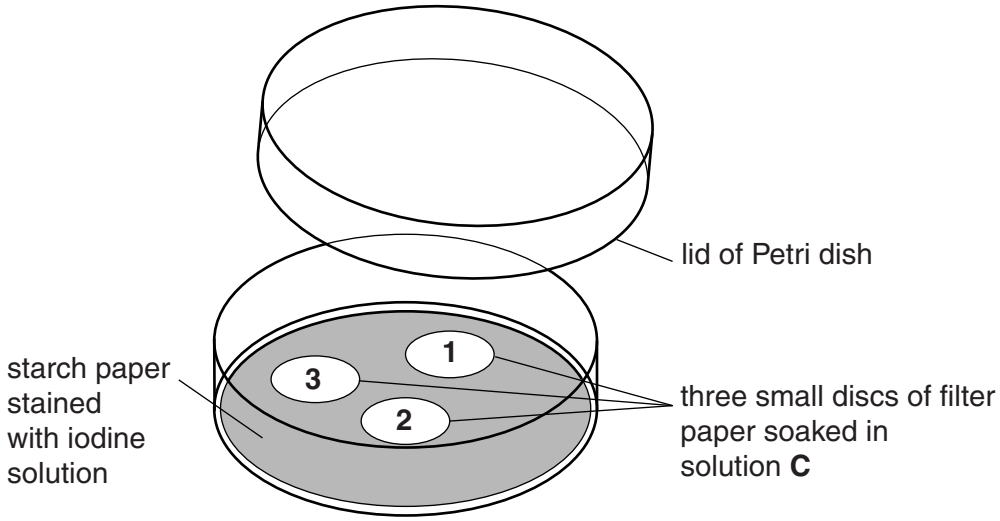


Fig. 2.1

- Place the lid on the Petri dish. Record the time .....
- Look carefully at the stained paper every minute, for up to 5 minutes and record your observations in Table 2.1.

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(a) (i)

For Examiner's Use

Table 2.1

time /mins	observations		
	1st disc	2nd disc	3rd disc
0			
1			
2			
3			
4			
5			

[2]

- Look at the dish after 6 minutes. Measure the diameters of the zones around the filter paper discs that show a change in colour. Record your measurements in Table 2.2.

(a) (ii)

Table 2.2

time /mins	diameter of zone/mm		
	1st disc	2nd disc	3rd disc
6			

[1]

(b) (i) Suggest and explain what has happened to the starch around the discs.

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..... [3]

(ii) Explain why seeds need the substance that has caused this to happen.

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.....[3]

(c) Describe how this method could be used to compare the seeds from two different types of plant.

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..... [3]

[Total: 12]

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Turn over for Question 3

3 Some students investigated the disease in rose bushes called Black Spot.

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They collected 20 rose leaflets at random from rose bushes growing in an area where the air was polluted.

Fig. 3.1 shows these rose leaflets.

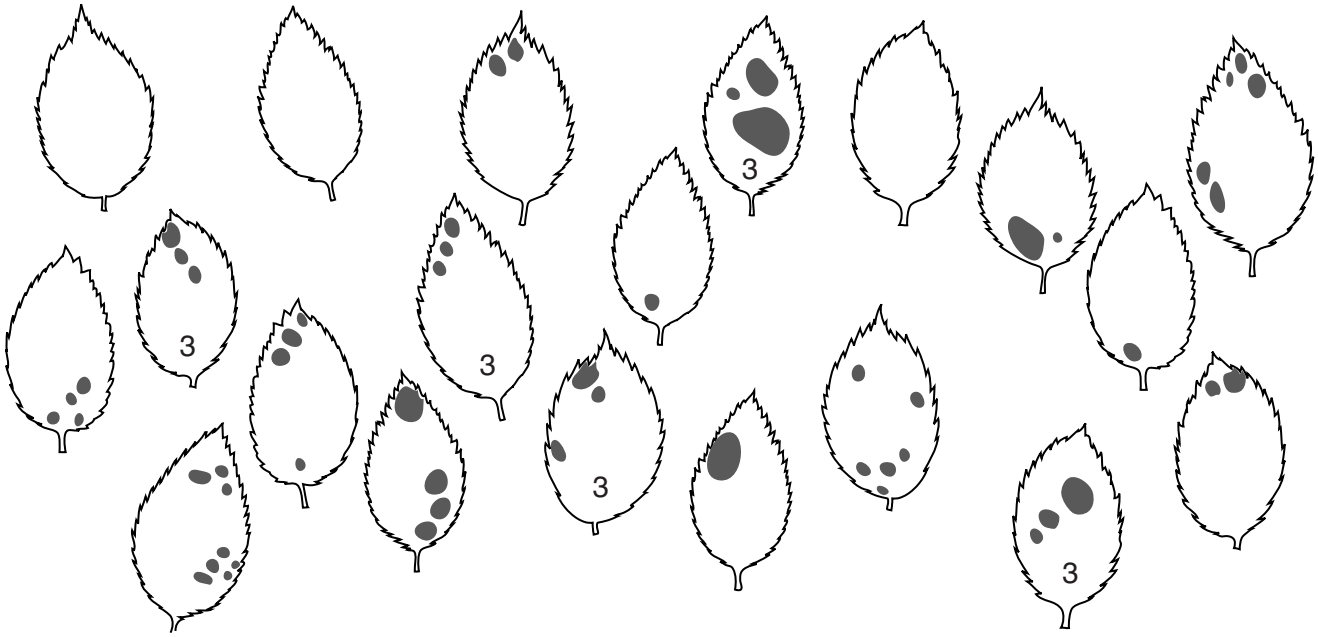


Fig. 3.1

(a) Count the number of spots on each leaflet shown in Fig. 3.1. There are 5 leaflets with 3 spots. Complete Table 3.1 for the other leaflets.

Table 3.1

number of spots / leaflet	number of leaflets
0	
1	
2	
3	5
4	
5	
6	
7	
8	

[2]

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(b) Construct a bar chart of the data in Table 3.1.

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[3]

Fig. 3.2 shows another 20 rose leaflets collected from an area where the air was clean.

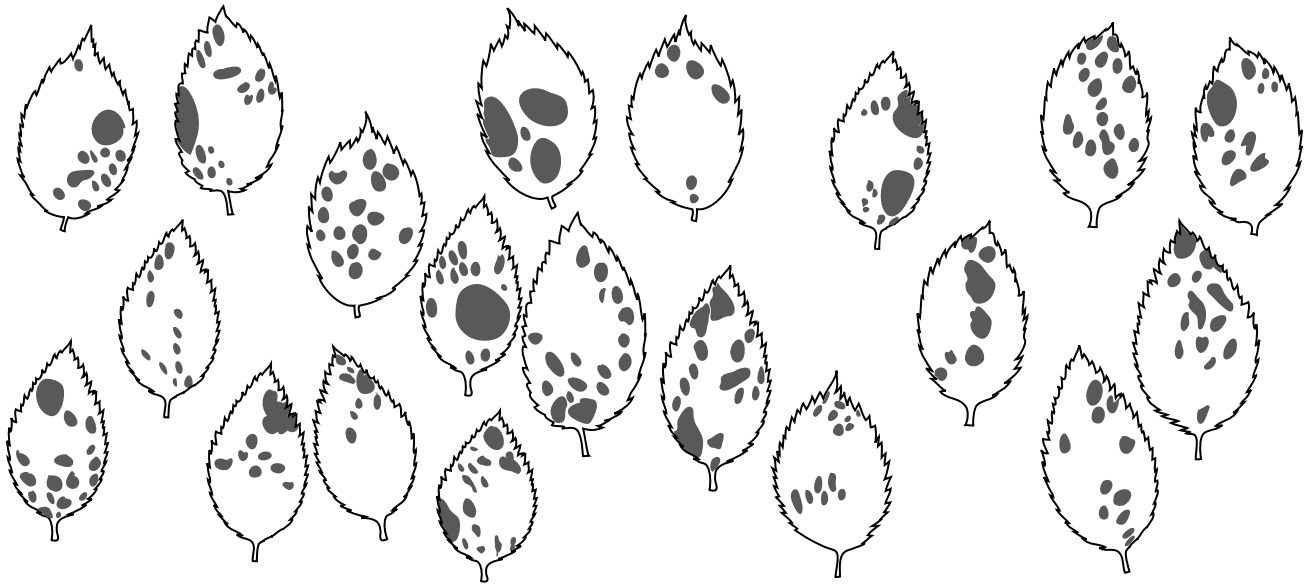


Fig. 3.2

(c) Using the information in Fig. 3.1 and Fig. 3.2, describe the effect of air pollution on this disease.

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..... [1]

(d) Suggest **one** improvement to make this investigation more reliable.

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..... [1]

[Total: 7]

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