UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2651038517

BIOLOGY **5090/62**

Paper 6 Alternative to Practical **October/November 2013**

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 space 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.

Electronic calculators may be used.

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

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1 Some students investigated the effect of two sugars on the activity of yeast.
Solution **A** was 10 cm^3 of 10% glucose in water.
Solution **B** was 10 cm^3 of 10% sucrose in water.

Fig. 1.1 shows the apparatus that was used.

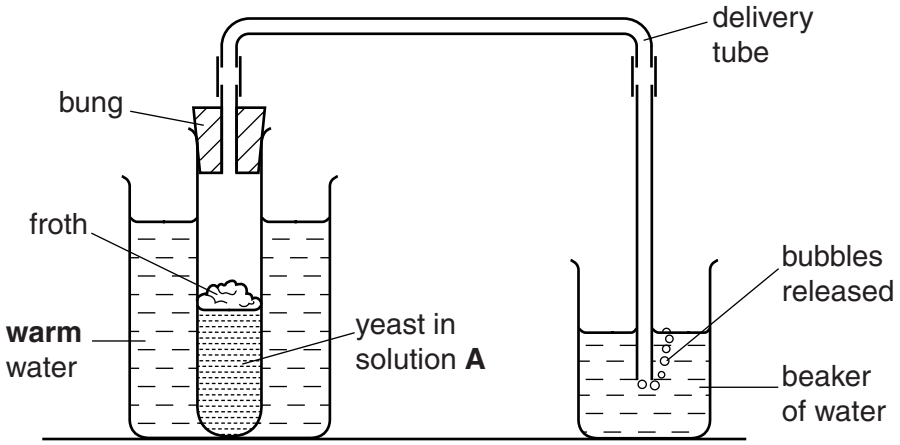


Fig. 1.1

- 3 g of dried yeast was added to solution **A** in a test-tube and shaken, then left standing in a beaker of warm water for five minutes.
- The delivery tube was attached and the number of bubbles released in one minute was counted and recorded as 'first count' in Table 1.1.
- The test-tube containing the mixture was gently shaken again, while still in the beaker of warm water.
- The number of bubbles released was counted again for one minute and recorded as the 'second count' in Table 1.1.
- A third count was taken in the same way.

This whole procedure was repeated using another 3 g of dried yeast mixed with solution **B**.

The results were recorded as shown in Table 1.1.

Table 1.1

solution	number of bubbles of gas released in one minute		
	first count	second count	third count
A glucose in water	13	12	10
B sucrose in water	36	34	32

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(a) Using data from Table 1.1, describe what these 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.

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..... [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 yeast and sugar solution had to be left for 5 minutes.

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..... [1]

(ii) Explain why the bubbles were counted three times for each solution.

.....

..... [1]

(iii) Suggest why the test-tubes were shaken between the counts.

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..... [1]

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[Turn over

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

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..... [3]

(d) Fig. 1.2 shows a yeast cell dividing.

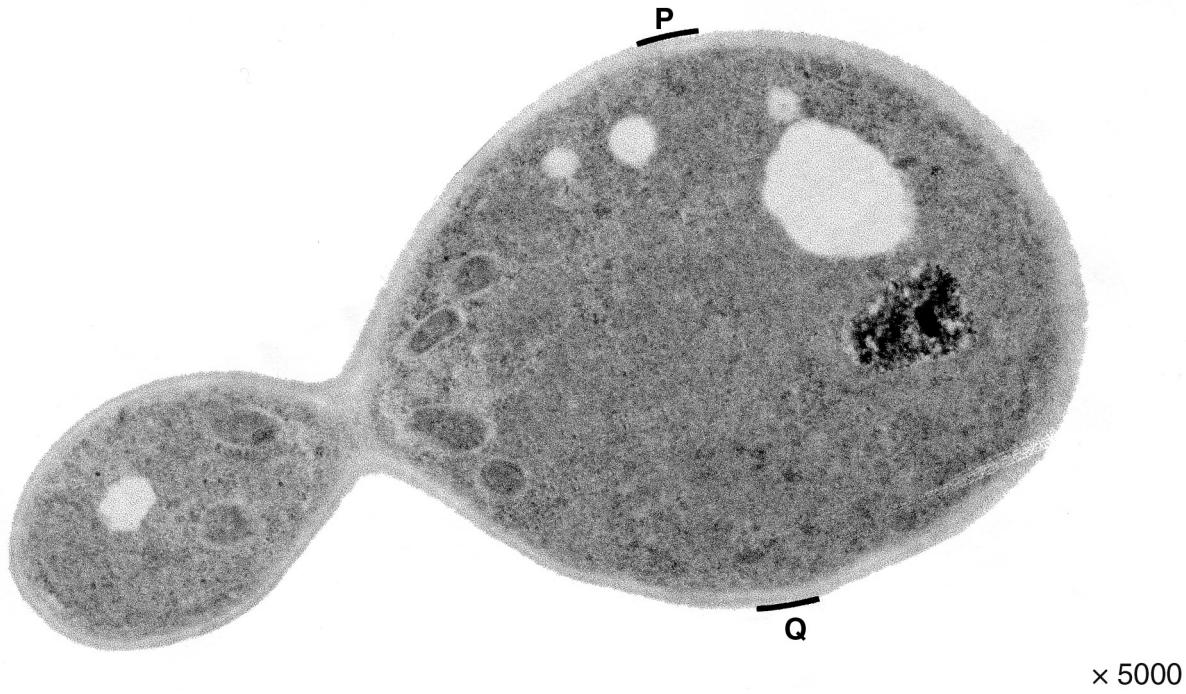


Fig. 1.2

(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]

2 Some students were provided with a solution **C**, prepared from seeds soaked in water, ground up and filtered.

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- They were provided with damp starch paper in a Petri dish.
- They added drops of dilute iodine solution so that it was evenly stained.
- Three small discs of **filter** paper were cut and soaked in solution **C**.
- These discs were carefully placed onto the stained starch paper in the Petri dish.
- The lid was replaced, as shown in Fig. 2.1.
- The time was noted.
- They looked at the dish every minute for 6 minutes. Around the filter paper discs on the starch paper were zones of yellow which increased in diameter with time.

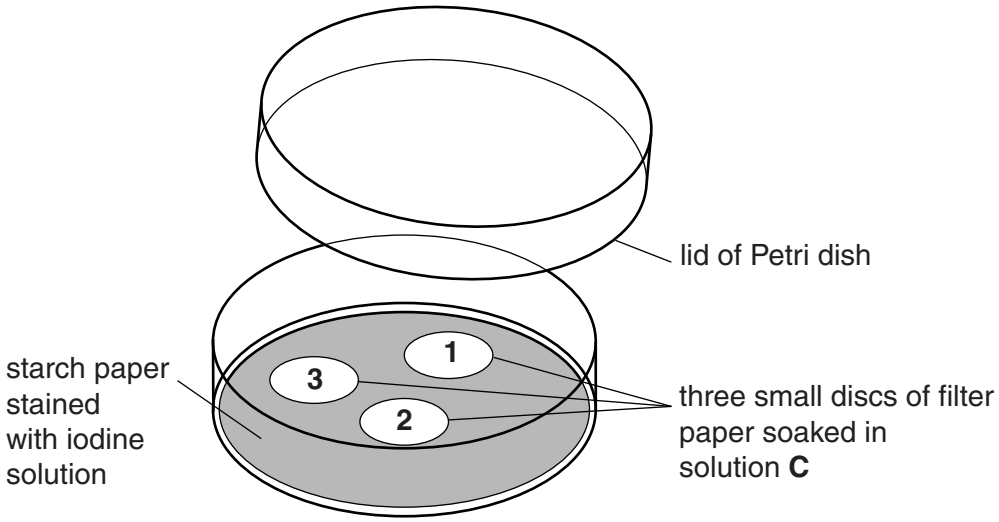


Fig. 2.1

Fig. 2.2 shows the diameter of these zones after six minutes.

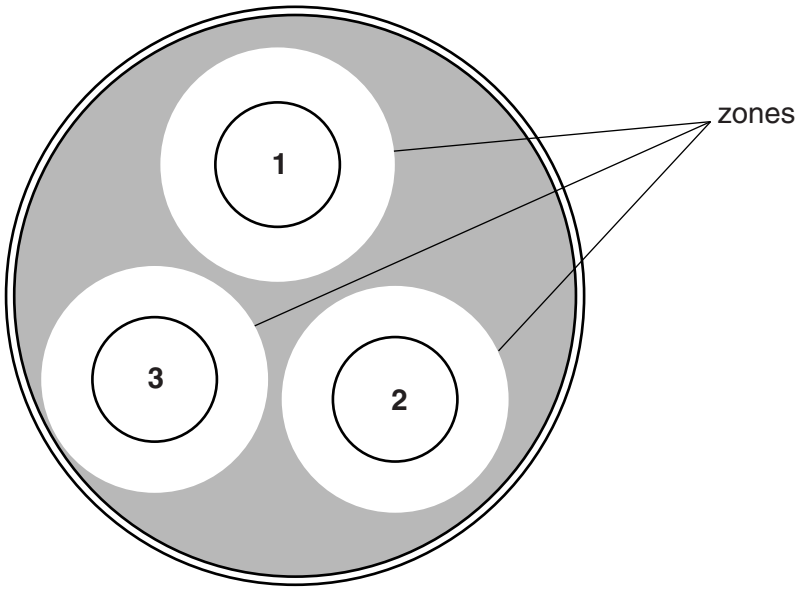


Fig. 2.2

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(a) Measure the diameter of each of the zones shown in Fig. 2.2 and record your measurements in Table 2.1.

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Table 2.1

time / min	diameter of yellow zone / mm		
	1	**2**	**3**
0	15	15	15
1	17	16	16
2	19	18	19
3	23	21	22
4	25	24	26
5	27	28	28
6			

[2]

(b) (i) Describe a positive test for the presence of starch.

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..... [1]

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

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

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(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, called Black Spot, in rose bushes.

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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 the rose leaflets collected.

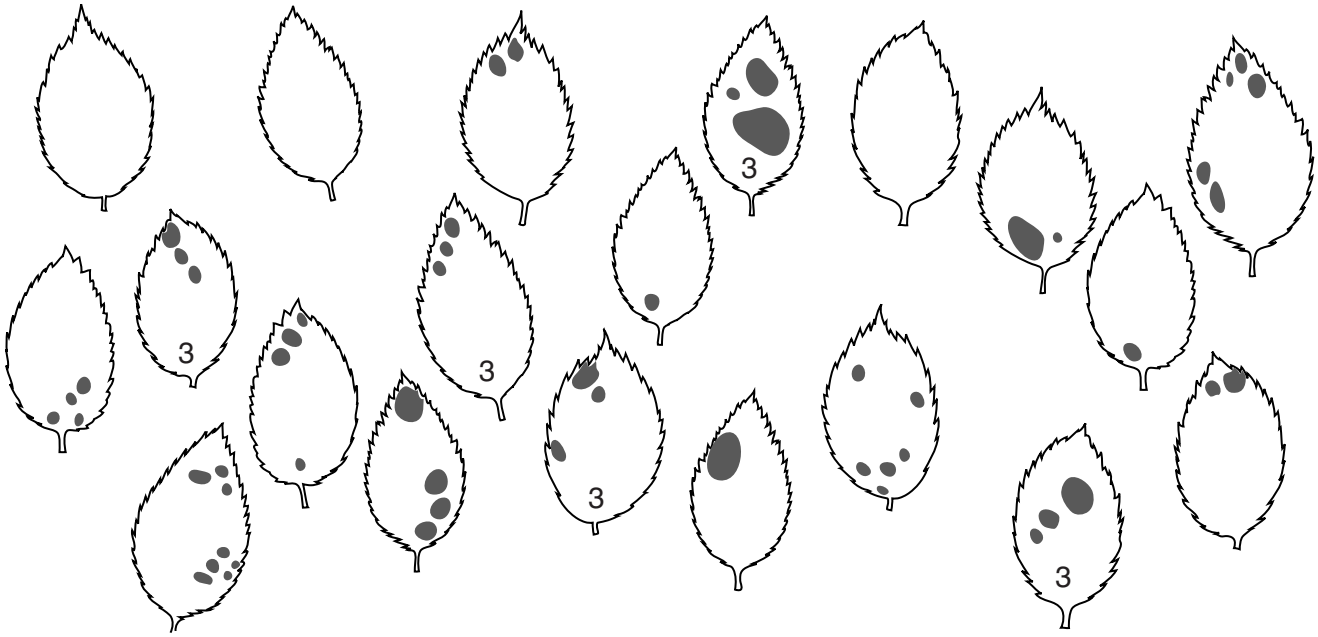


Fig. 3.1

(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.

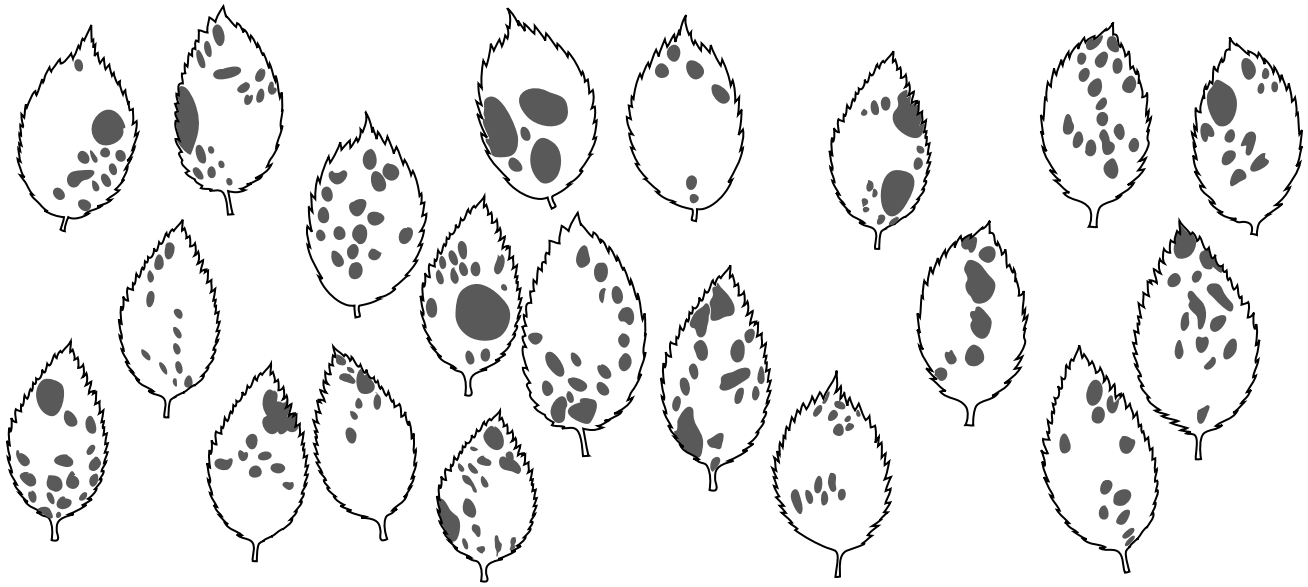


Fig. 3.2

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

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..... [1]

[Total: 7]

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