Cambridge IGCSE

**Cambridge International Examinations**
Cambridge International General Certificate of Secondary Education

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|---|---|
| CANDIDATE NAME | |
| CENTRE NUMBER | |
| CANDIDATE NUMBER | |

*6185228460*

**BIOLOGY** **0610/52**

Paper 5 Practical Test **May/June 2018**

**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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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 | |
| Total | |

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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




CAMBRIDGE International Examinations

**1** You are going to investigate the rate of respiration in yeast at two different temperatures.

**Read all the instructions but DO NOT CARRY THEM OUT until you have drawn a table for your results in the space provided in 1(a)(ii).**

**You should wear the gloves provided during the practical work in question 1.**

Step 1 Use a ruler and marker pen to mark the two large test-tubes at 1 cm intervals from the base of the large test-tube to the top of the large test-tube as shown in Fig. 1.1.

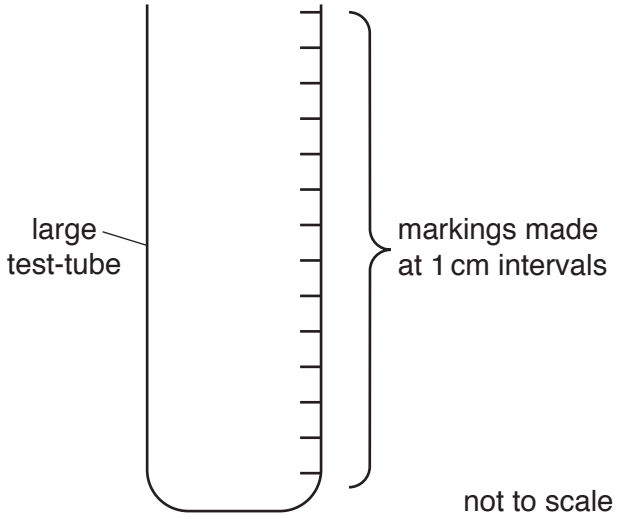



**Fig. 1.1**

Step 2 Raise your hand when you are ready for the water-bath beaker, labelled **warm**, to be filled with warm water.

Step 3 Measure the starting temperature of the water in the water-bath and record it in Table 1.1.

**(a) (i)**

**Table 1.1**

| water-bath | starting temperature / °C | final temperature / °C |
|---|---|---|
| warm | | |
| cool | | |

[1]

Step 4 Completely fill one of the small test-tubes with yeast suspension.

Step 5 Keep the small test-tube upright and carefully place the large test-tube over the top of the small test-tube. Push the small test-tube up to the top of the large test-tube as shown in Fig. 1.2A.

Step 6 Quickly invert the test-tubes as shown in Fig. 1.2B. Place the test-tubes into the water-bath labelled **warm** as shown in Fig. 1.2C. It does not matter if a small amount of air remains at the top of the smaller test-tube when it is inverted.

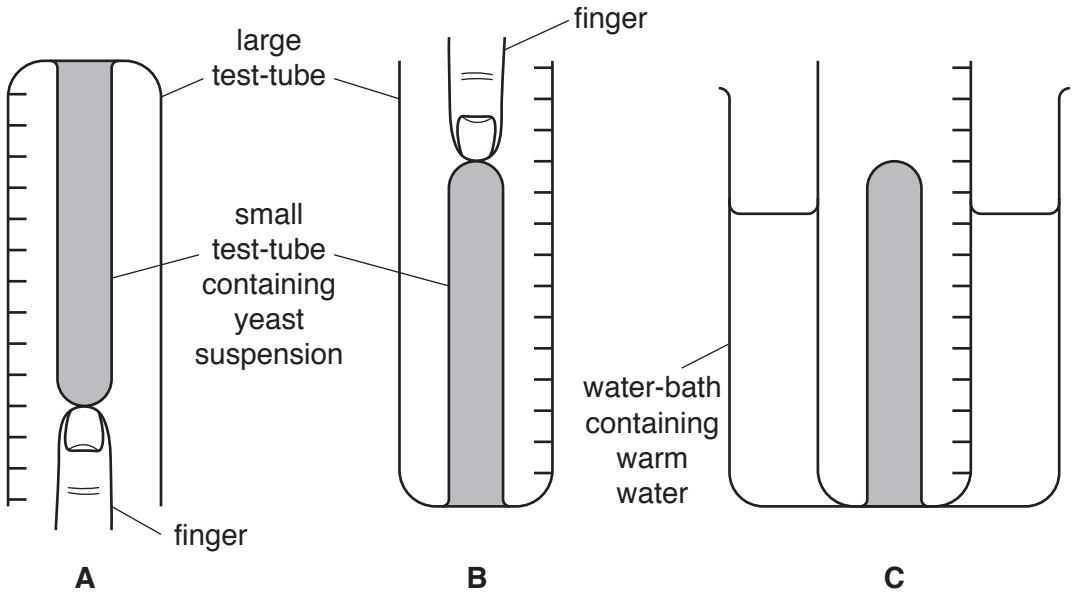



**Fig. 1.2**

Step 7 Use the markings you have drawn on the large test-tube to measure the height of the yeast suspension in the large test-tube. Record this measurement in your table in **1(a)(ii)**.

Step 8 Start the timer and measure the height of the yeast suspension in the large test-tube after one minute and record the result in your table.

Step 9 Repeat the measurement every minute for a total of five minutes.

Step 10 After five minutes record the final temperature of the water in the **warm** water-bath and record it in Table 1.1.

Step 11 Repeat steps 3 to 10 using the remaining small and large test-tubes and the water-bath labelled **cool**.

**(ii)** Prepare a table to record your results.

[4]

**(b) (i)** State a conclusion for your results.

.....

.....

.....[1]

**(ii)** Explain why the temperature of the water-bath was not an accurate measurement of the temperature of the yeast suspension in the small test-tube.

.....

.....

.....[1]

**(iii)** Identify the error present in step 7 of the method. Suggest how the method could be improved to reduce this error.

error .....

.....

improvement .....

.....

.....
[2]

**(iv)** Identify the variable that was changed (independent variable) and the variable that was measured (dependent variable) in this investigation.

independent variable .....

.....

dependent variable .....

.....
[2]

**(c)** A scientist investigated the effect of different concentrations of glucose on the rate of carbon dioxide production in yeast cells. They measured the volume of carbon dioxide produced by the yeast cells in five minutes.

**(i)** The scientist decided to test their method before beginning the investigation. They performed three trials using one concentration of glucose.

The results are given in Table 1.2.

**Table 1.2**

| trial | volume of carbon dioxide produced in 5 minutes /$cm^3$ |
|---|---|
| 1 | 13.6 |
| 2 | 14.3 |
| 3 | 12.9 |

Calculate the average volume of carbon dioxide produced in 5 minutes.

..... $cm^3$

Calculate the average rate of carbon dioxide production per minute.

..... $cm^3$ per minute
[2]



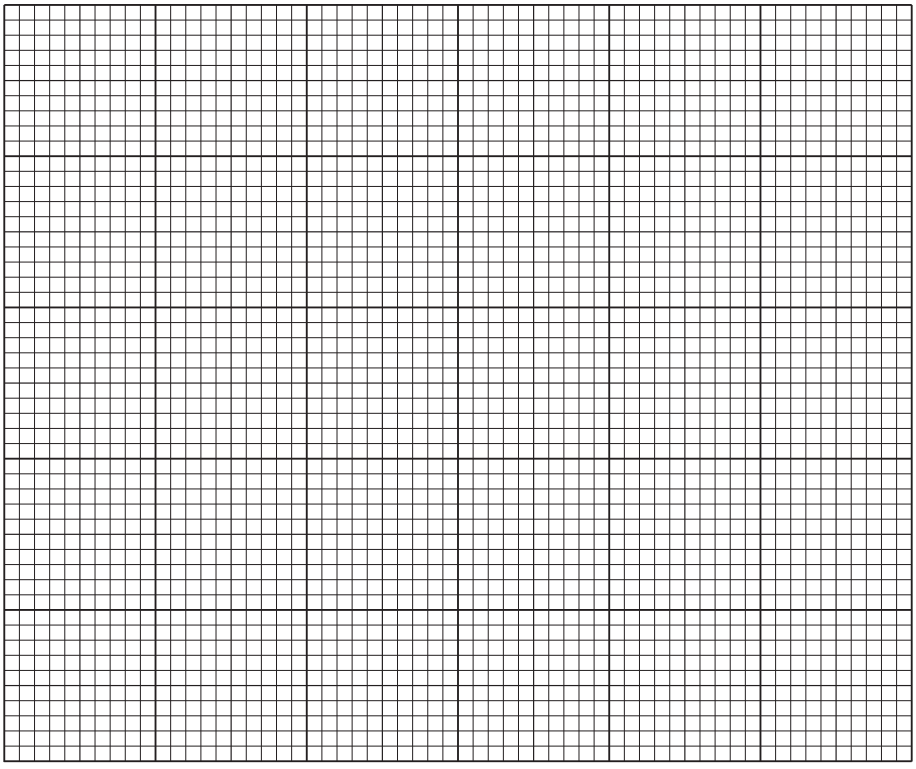
**[Turn over**

**(ii)** The scientist performed the investigation. Their results are shown in Table 1.3.

**Table 1.3**

| percentage concentration of glucose | average rate of carbon dioxide production / $cm^3$ per minute |
|---|---|
| 0.5 | 1.3 |
| 1.0 | 2.6 |
| 1.5 | 3.8 |
| 2.0 | 4.3 |
| 2.5 | 4.4 |
| 3.0 | 4.4 |

Plot a graph on the grid, using the data in Table 1.3, to show the effect of glucose concentration on the rate of carbon dioxide production. Include a line of best fit.



[4]

**(iii)** Describe the effect of glucose concentration on the rate of carbon dioxide production by respiring yeast cells shown in your graph.

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.....

.....[3]

**(iv)** Estimate the concentration of glucose the scientist used to test their method. Use your answer for **1(c)(i)** and your graph to find this value.

..... % [1]

**(d) (i)** Describe how the student could show that the glucose used in the investigation is a simple (reducing) sugar.

.....

.....

.....

.....

.....[3]

**(ii)** Identify one hazard when testing for simple (reducing) sugars.

Describe one precaution that could be taken to reduce the risk.

hazard .....

.....

precaution .....

.....
[2]

[Total: 26]

**2** Fig. 2.1 shows *Asterionella*, which are microscopic algae that live in fresh water.

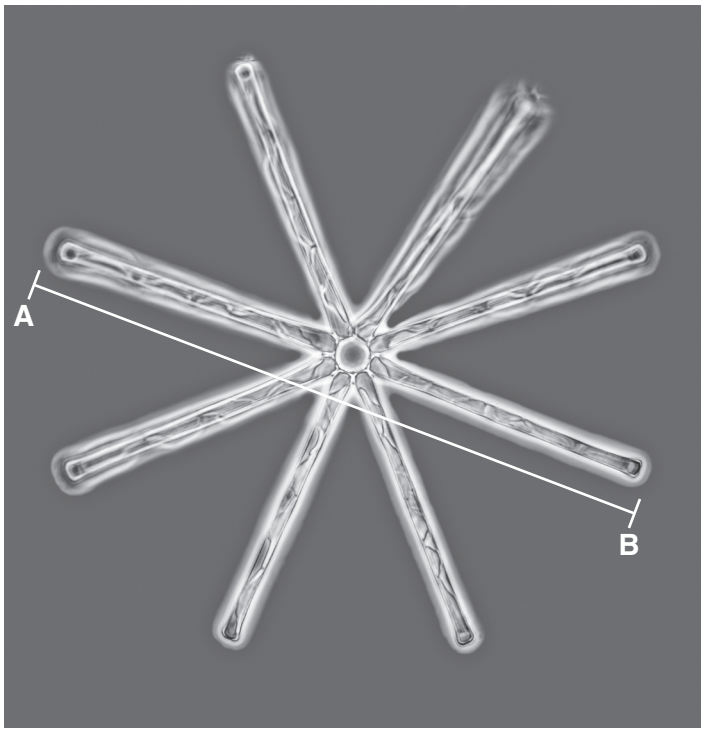


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**Fig. 2.1**

**(a) (i)** Make a large outline drawing of the algae. Do not label your drawing.

[4]

**(ii)** Measure the length of the line **AB** in Fig. 2.1. Include the unit.

length of **AB** .....

Use the formula to calculate the actual diameter of the algae shown in Fig. 2.1. Include the unit.

$$\text{magnification} = \frac{\text{length of line } \mathbf{AB}}{\text{actual diameter of algae}}$$

Show your working.

.....
[3]

**(b)** Algae photosynthesise. This process uses carbon dioxide.

Hydrogencarbonate indicator can be used to determine the concentration of carbon dioxide in a solution.

| colour of hydrogencarbonate indicator | concentration of carbon dioxide |
|---|---|
| purple | low |
| red | medium |
| yellow | high |

**(i)** A student wanted to use hydrogencarbonate indicator to investigate the effect of light intensity on photosynthesis in fresh water algae.

Describe how the student could carry out this experiment.

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.....[6]

**(ii)** State the name of a pH indicator, other than hydrogencarbonate, which could be used to detect a change in pH.

.....[1]

[Total: 14]

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