Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **May/June 2019**

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.
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.

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

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

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1 Anaerobic respiration in yeast causes the blue dye, methylene blue, to become colourless.

A student investigated the effect of temperature on the rate of respiration in yeast.

Step 1 7 cm^3 of a yeast suspension was put into a test-tube labelled **warm**. The test-tube was then placed into a beaker of warm water. The temperature of the water in the beaker was 45 °C.

Step 2 7 cm^3 of a yeast suspension was put into a test-tube labelled **cool**. The test-tube was then placed into a beaker of cool water. The temperature of the water in the beaker was 20 °C.

Step 3 After three minutes, the student added five drops of methylene blue dye to the yeast suspensions in each of the test-tubes. The yeast suspensions became blue in both test-tubes.

Step 4 A layer of vegetable oil was carefully poured on top of the yeast suspension in each of the test-tubes, as shown in Fig. 1.1.

The layer of oil stopped air from reaching the yeast cells in the suspension so that the conditions were anaerobic

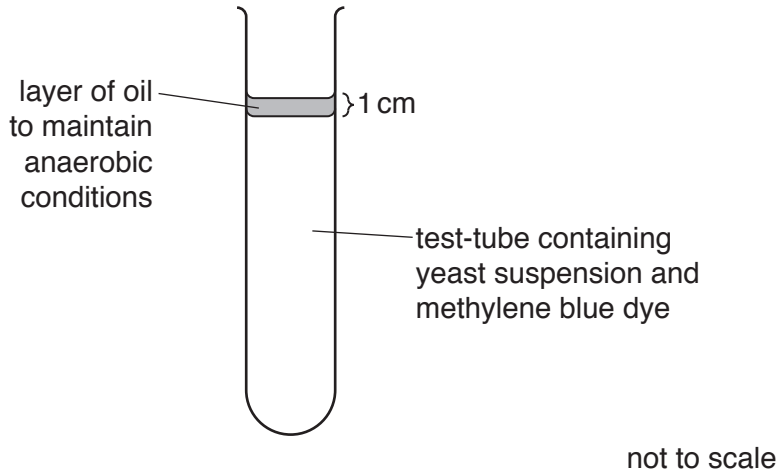

Fig. 1.1

Step 5 A stop-clock was started.

Step 6 The student observed the **warm** and **cool** test-tubes. When they could no longer see the blue colour they recorded the time taken for the blue colour to disappear.

Fig. 1.2 shows the time on the stop-clock for each test-tube at the end of step 6.

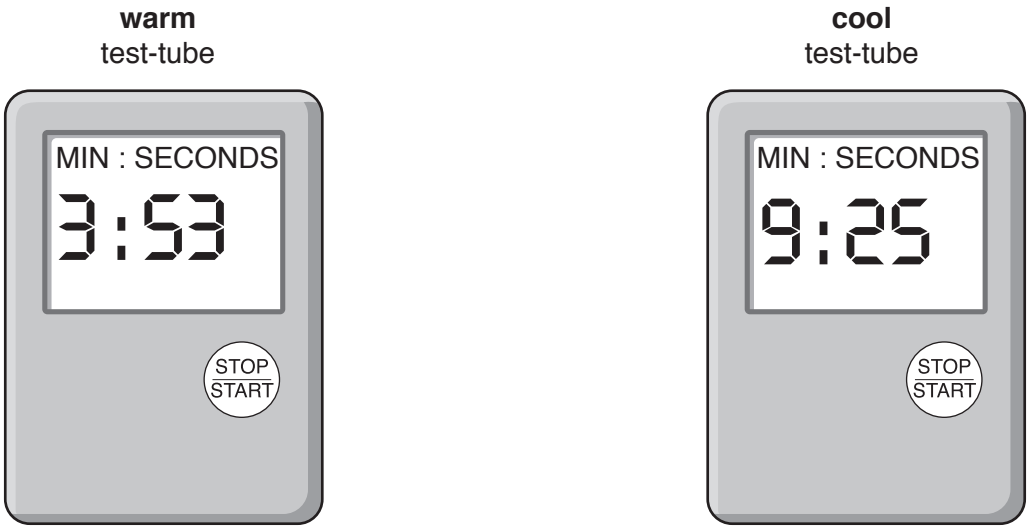

Fig. 1.2

(a) (i) Prepare a table to record the results.

View solution

Convert the times shown in Fig. 1.2 to seconds and record them in your table.

[3]

(ii) State a conclusion for the results in your table in **1(a)(i)**.

View solution

.....

.....

..... [1]

Step 7 The student used a thermometer to measure the temperatures of the warm water beaker and the cool water beaker at the end of the investigation.

Fig. 1.3 shows the temperatures on the thermometer at the **end** of the investigation.

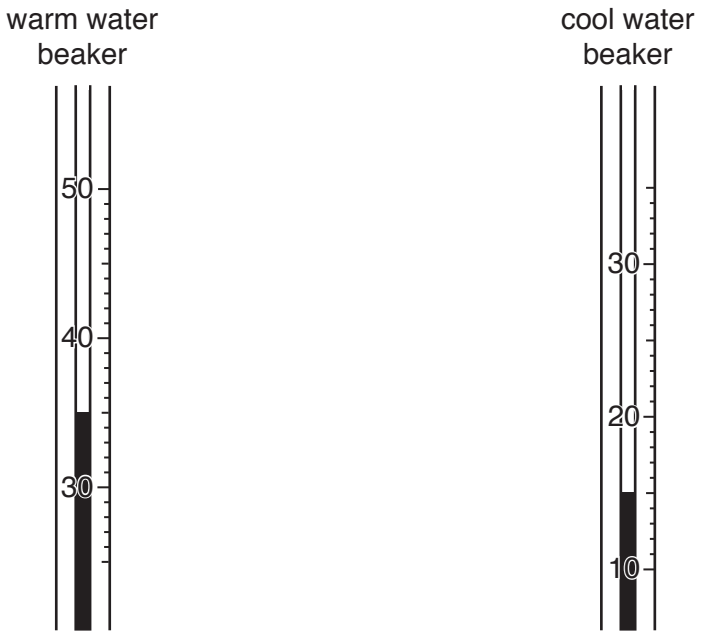

Fig. 1.3

(iii) Complete Table 1.1 by recording the temperatures in the beakers at the start and at the end of the investigation.

View solution

Table 1.1

beaker	temperature at the start / °C	temperature at the end / °C
warm water		
cool water		

[1]

(iv) Identify the variable that was changed (independent variable) in this investigation.

View solution

..... [1]

(v) Identify **two** variables that were kept constant in this investigation.

View solution

1 .....

2 .....

[2]

(b) (i) Identify **one** possible source of error in step 6 and suggest an improvement for this error.

View solution

error .....

.....

improvement .....

.....

.....

[2]

(ii) The data you have recorded in Table 1.1 may indicate that there is a source of error with the method used in this investigation.

View solution

Identify the possible error and suggest an improvement to the method to reduce the effect of this error.

error .....

.....

improvement .....

.....

.....

[2]

(c) Anaerobic respiration in yeast produces a gas.

View solution

State the name of an indicator which could be used to show that the gas is carbon dioxide and state the expected result.

indicator .....

expected result .....

[2]

(d) Anaerobic respiration in yeast cells also produces ethanol. In high concentrations ethanol can slow down the rate of respiration.

View solution

Plan an investigation to determine the effect of different concentrations of ethanol on the rate of respiration in yeast cells.

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..... [6]

[Total: 20]

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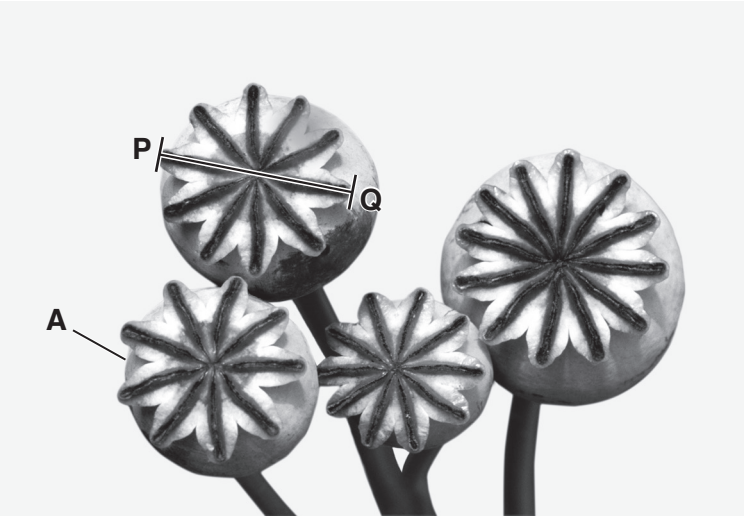
2 **(a)** Fig. 2.1 is a photograph showing four seed heads from a poppy plant.

View solution



magnification ×1.6

Fig. 2.1

(i) Draw a large diagram of the seed head labelled **A**.

[4]

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(ii) Measure the length of line **PQ** on Fig. 2.1. Include the unit.

View solution

length of line **PQ** .....

Calculate the actual size of the seed head using the formula and your measurement.

$$\text{magnification} = \frac{\text{length of line } \mathbf{PQ}}{\text{actual diameter of the seed head}}$$

Give your answer to the nearest whole number and include the unit.

Show your working.

.....

[3]

(b) A student investigated the effect of pH on the germination of seeds. The student planted 25 seeds for each pH value.

View solution

The results of the investigation are shown in Table 2.1.

Table 2.1

pH	number of seeds that germinated	percentage of seeds that germinated
4	20	80
5	23	92
6	24	96
7	19	76
8	15	
9	10	40

(i) Calculate the percentage of seeds that germinated at pH 8.

Show your working.

..... %
[2]

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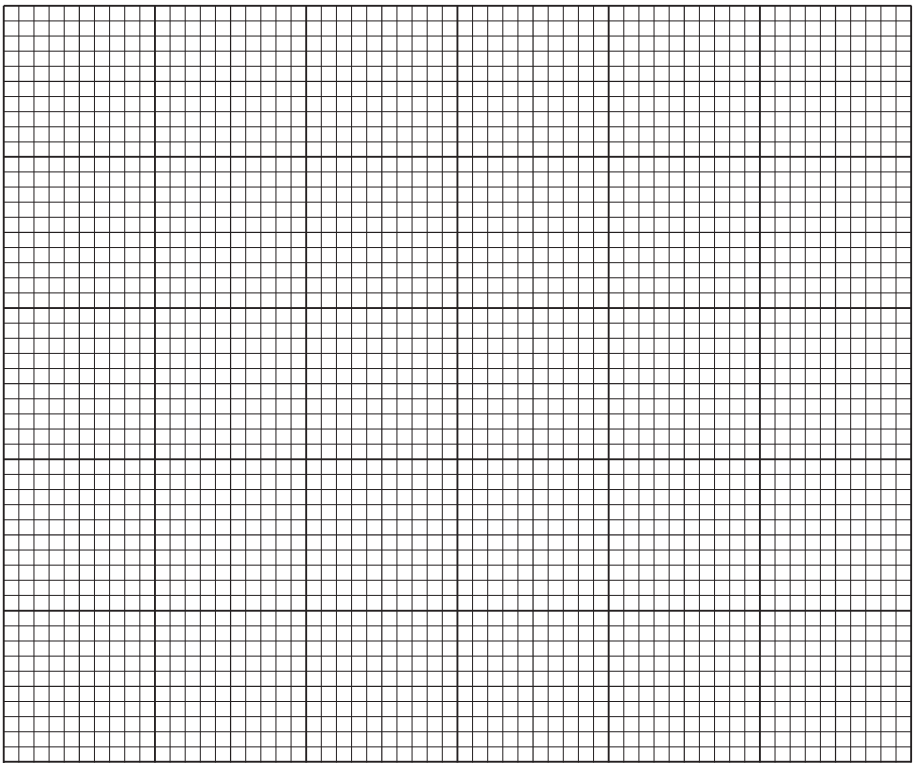
(ii) Plot a line graph on the grid to show the effect of pH on the percentage of seeds that germinated using the data in Table 2.1.

View solution



[4]

(iii) Describe the effect of pH on the percentage of seeds that germinated shown in your graph.

View solution

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..... [2]

(iv) The student wanted to obtain a more accurate value for the optimum (best) pH for the germination of seeds.

View solution

Suggest further investigative work that the student should carry out.

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..... [2]

(c) During germination the starch within seeds is broken down to form reducing sugars.

View solution

Describe how you could test a sample of germinating seeds to find out if reducing sugars are present.

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..... [3]

[Total: 20]

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