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 | **February/March 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 **12** printed pages.

DC (JM/CB) 168097/6

Cambridge Assessment International Education

1 A student investigated the effect of two different types of washing powder on stained cloth. One was biological and contained enzymes and detergent. The other was non-biological and contained only detergent.

They were provided with:

- four pieces of dry cloth that had been stained with the same food
- a solution of biological washing powder in a beaker labelled **bio**
- a solution of non-biological washing powder in a beaker labelled **non-bio**
- distilled water in a beaker labelled **water**.

Step 1 A marker pen was used to divide a white tile into four sections. The four sections were labelled **bio**, **non-bio**, **water** and **not washed**.

Step 2 One piece of stained dry cloth was placed on the **not washed** section of the white tile.

Step 3 One piece of stained dry cloth was placed into each of the solutions labelled **bio**, **non-bio** and **water**.

Step 4 One glass rod was used to push the pieces of cloth into the liquid in each beaker. The liquid in each beaker was then stirred for 10 seconds.

Step 5 The liquid in each beaker was stirred again, for 10 seconds, after 5, 10 and 15 minutes.

Step 6 After 15 minutes each piece of cloth was removed from the liquid and placed on the labelled area of the white tile.

Step 7 The student observed the stain on each piece of cloth and used the intensity score in Table 1.1 to determine the intensity of the stain on the four pieces of cloth.

A drawing of the four pieces of cloth at the end of the experiment is shown in Fig. 1.1.

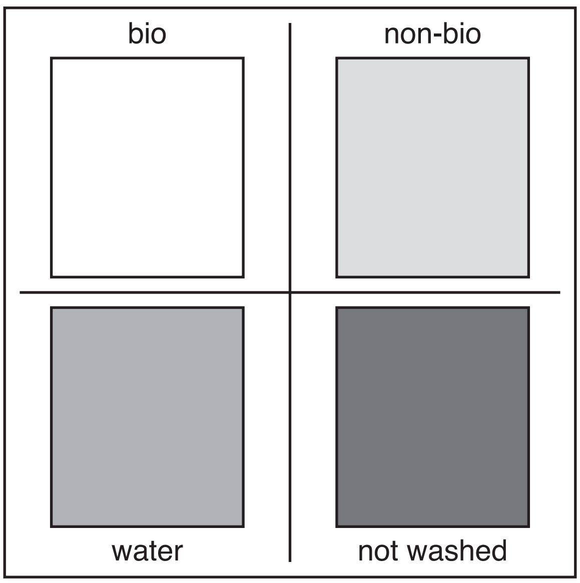

Fig. 1.1

Table 1.1

intensity score	
lowest intensity	+
↓	++
	+++
highest intensity	++++

(a) **(i)** Prepare a table to record the results in the space provided.

Use the information in Fig. 1.1 and Table 1.1 to match the intensity of the stain to a score for each piece of cloth. Record the intensity scores in your table.

[3]

(ii) State the variable that was measured (dependent variable) in this investigation.

.... [1]

(iii) State **one** variable that was kept the same in this investigation.

.... [1]

(iv) Identify **one** source of error in step 4 and explain how it might affect the results.

error ....

explanation ....

....

.... [2]

(v) Identify a control in this experiment and explain why this control was used.

....

....

....

.... [2]

(vi) State why the method used in step 7 may not give accurate results.

....

....

.... [1]

(b) Some students wanted to find the optimum (best) temperature for using biological washing powder.

A Petri dish was filled with agar jelly containing starch. A circular hole was cut into the centre of the agar. A solution of the biological washing powder was put into the hole. The Petri dish was incubated at 10 °C for 10 hours.

After 10 hours iodine solution was poured onto the agar in the Petri dish.

This procedure was repeated at different temperatures.

A typical result is shown in Fig. 1.2.

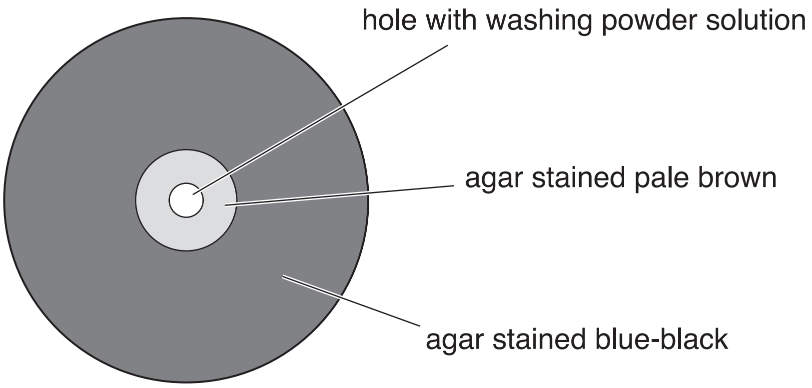

Fig. 1.2

(i) State the variable that was changed (independent variable) in the investigation described in **1(b)**.

.... [1]

(ii) Some of the agar is stained blue-black and some is stained pale brown.

State a conclusion for this result.

....

....

.... [1]

(iii) The diameter of the pale brown stained area was measured during the investigation.

The results are shown in Table 1.2.

Table 1.2

temperature / °C	diameter of pale brown stained area / mm
10	11
20	14
30	18
40	22
50	22
60	7
70	5

Plot a line graph on the grid of the data in Table 1.2.

[4]

(iv) Describe the trend shown by the data in Table 1.2 and your graph.

....

....

....

.... [2]

(v) The students were unable to determine the optimum temperature from their results.

Describe what additional measurements would be needed to find the optimum temperature.

....

....

....

.... [2]

[Total: 20]

2 Fig. 2.1 shows photomicrographs of lung tissue at the same magnification. One shows healthy lung tissue and the other shows lung tissue from a person with COPD.

Line **AB** shows the diameter of one healthy alveolus. Line **CD** shows the diameter of an area of lung where the alveoli have been destroyed.

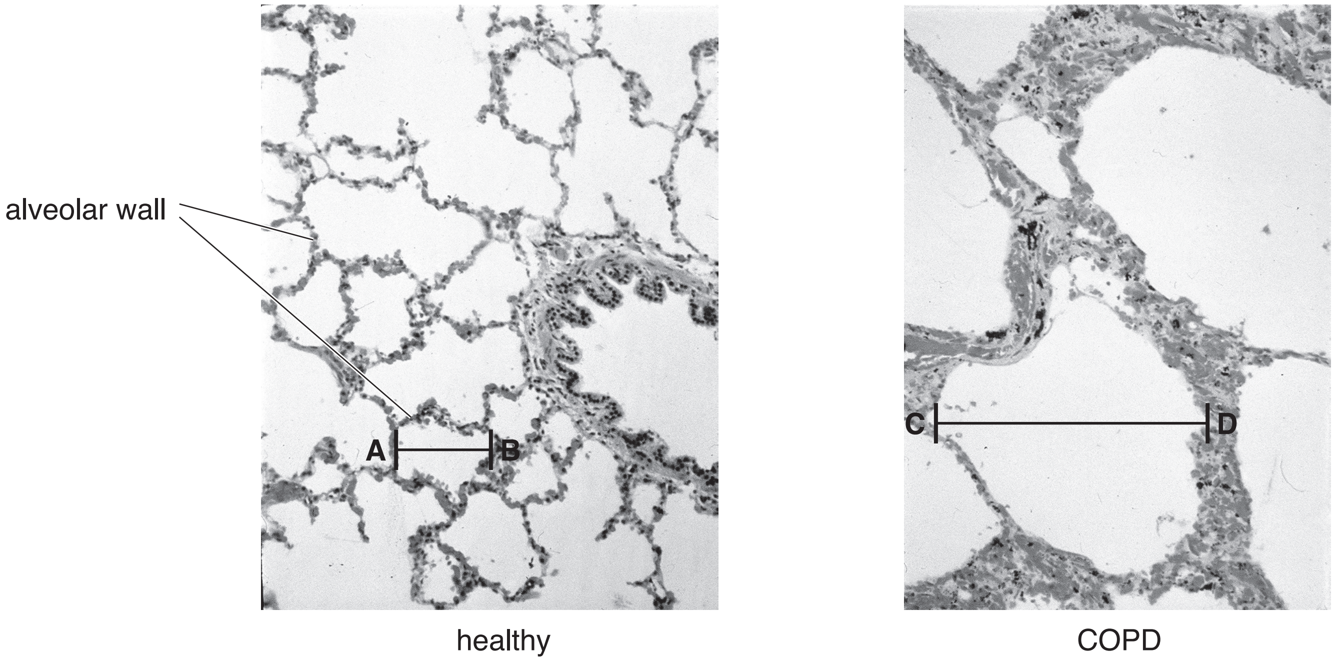

Fig. 2.1

(a) **(i)** Make a large drawing of the lung tissue of the person with COPD shown in Fig. 2.1. Do not draw individual cells.

[4]

(ii) Measure the length of **CD** as shown on Fig. 2.1. Include the unit.

length of **CD** ....

Mark on your drawing the position of the line **CD** and measure the length of the line you have drawn. Include the unit.

length of line on your drawing ....

Calculate the magnification of your drawing. Give your answer to the nearest whole number.

$$\text{magnification} = \frac{\text{length of line on your drawing}}{\text{length of } \mathbf{CD} \text{ on Fig. 2.1}}$$

Space for working.

....
[3]

(iii) Describe **three** visible ways that the lungs of the healthy person differ from the person with COPD in Fig. 2.1.

1 ....

....

2 ....

....

3 ....

....
[3]

(b) Some students decided to investigate the concentration of carbon dioxide in expired air compared to that in inspired air.

They used the apparatus shown in Fig. 2.2 by breathing into the tube labelled **T**.

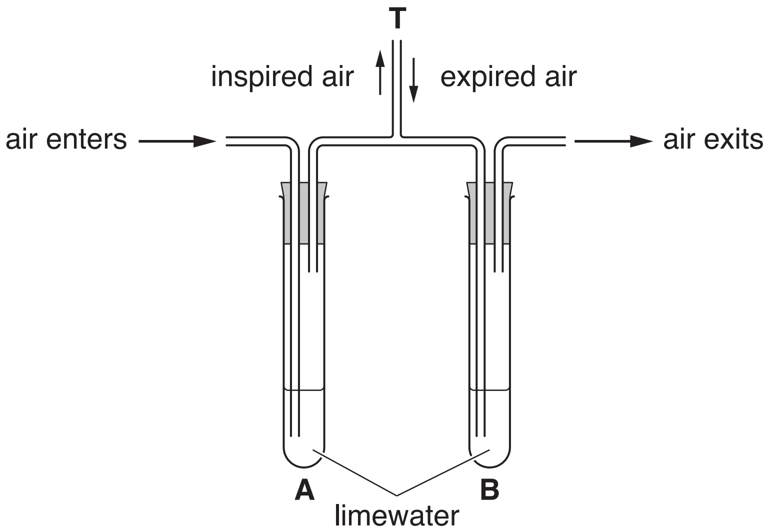

Fig. 2.2

(i) Suggest **one** possible hazard in this investigation.

.... [1]

(ii) State **one** other substance which could be used instead of limewater to determine the concentration of carbon dioxide.

....

.... [1]

(iii) When the students used the apparatus shown in Fig. 2.2, inspired air passed through the limewater in test-tube **A** and expired air passed through the limewater in test-tube **B**.

The students timed how long it took for the limewater in test-tubes **A** and **B** to go cloudy.

Their results are shown in Table 2.1.

Table 2.1

time taken for limewater to go cloudy / s	
test-tube **A**	test-tube **B**
600	6

The concentration of carbon dioxide in inspired air is 0.04%.

Calculate, using the results in Table 2.1, the concentration of carbon dioxide in expired air.

Show your working.

.... %
[2]

(c) A student wanted to investigate the hypothesis:

‘Expired air contains more carbon dioxide immediately after exercise than before exercise.’

Plan an investigation using the apparatus shown in Fig. 2.2 to test this hypothesis.

....

....

....

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....

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....

....

....

....

.... [6]

[Total: 20]