Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **0610/52**

Paper 5 Practical Test **October/November 2023**

1 hour 15 minutes

You must answer on the question paper.

You will need: The materials and apparatus listed in the confidential instructions

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

For Examiner's Use	
1	
2	
3	
Total	

This document has **12** pages. Any blank pages are indicated.

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1 You are going to investigate the effect of temperature on the activity of amylase.

Amylase is an enzyme that catalyses the breakdown of starch to form reducing sugars.

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

You should use the safety equipment provided while you are doing the practical work.

Step 1 Use the pen to draw a line down the middle of the spotting tile. Write the numbers and the letters **C** and **H** on the spotting tile, as shown in Fig. 1.1.

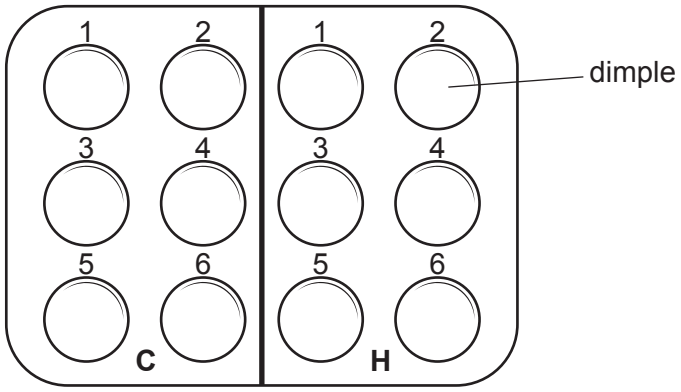

Fig. 1.1

Step 2 Place one drop of iodine solution into each of the labelled dimples on the spotting tile.

Step 3 Label one test-tube **C** and the other test-tube **H**. Place the test-tubes in the test-tube rack.

Step 4 Use the syringe to put 2 cm^3 of **starch suspension** into test-tube **C** and into test-tube **H**.

Step 5 Place test-tube **C** and the test-tube labelled **amylase C** into the water in beaker **C**.

Start the stop-clock.

Step 6 After three minutes, stop the stop-clock and pour the contents of test-tube **amylase C** into test-tube **C**.

Restart the stop-clock, wait for 30 seconds and then continue to step 7.

Step 7 Use a pipette to remove a sample of liquid from test-tube **C**.

Place two drops of this sample into the dimple labelled **C1** on your spotting tile. Return the rest of the sample in the pipette to test-tube **C**.

Step 8 Observe the colour of the liquid in dimple **C1**. Record this colour in your table in **1(a)(i)**.

Step 9 Repeat step 7 and step 8 at 30-second intervals, using the dimples labelled **C2**, **C3**, **C4**, **C5** and **C6**.

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Step 10 Raise your hand when you are ready for hot water to be added to beaker **H**.

Step 11 Place test-tube **H** and test-tube **amylase H** into the hot water in beaker **H**. Reset the stop-clock to zero. Start the stop-clock again.

Step 12 After three minutes, stop the stop-clock and pour the contents of test-tube **amylase H** into test-tube **H**. Restart the stop-clock, wait for 30 seconds and then continue to step 13.

Step 13 Use a pipette to remove a sample of the liquid from test-tube **H**.

Place two drops of this sample into the dimple labelled **H1** on your spotting tile. Return the rest of the sample in the pipette to test-tube **H**.

Step 14 Observe the colour of the liquid in dimple **H1**. Record this colour in your table in **1(a)(i)**.

Step 15 Repeat step 13 and step 14 at 30-second intervals, using the dimples labelled **H2**, **H3**, **H4**, **H5** and **H6**.

(a) (i) Prepare a table for your results.

View solution

[4]

(ii) State the colour of iodine solution when starch is present.

..... [1]

(iii) State a conclusion for your results.

.....

.....

..... [1]

(iv) State the independent variable in this investigation.

..... [1]

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

1 .....

.....

2 .....

.....

[2]

(b) (i) Explain why the method used in this investigation does **not** allow you to obtain an accurate time for the breakdown of starch.

.....

.....

..... [1]

(ii) The temperature of the water in the beakers during the investigation was a source of error.

Describe how you could improve the method to reduce this error.

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.....

.....

..... [1]

[Total: 11]

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2 **(a)** Milk contains fats. The enzyme lipase catalyses the breakdown of fats to form fatty acids and glycerol. The fatty acids cause the pH of the milk to decrease.

Plan an investigation to determine the effect of lipase concentration on the breakdown of fats in milk.

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..... [6]

(b) The emulsion test is used to test a sample of food for fat.

View solution

Describe the method you would use to do the emulsion test.

.....

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.....

.....

..... [2]

[Total: 8]

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3 Fig. 3.1 is a photograph of a type of seaweed called bladder wrack. The bladders help the seaweed float in water.

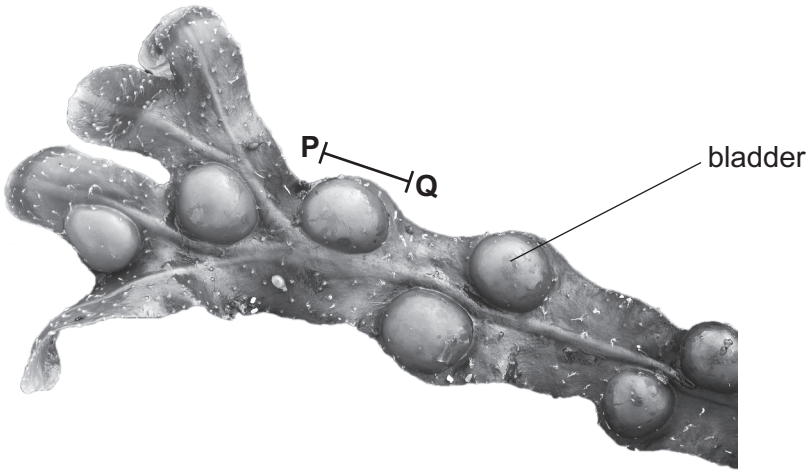

Fig. 3.1

(a) (i) Draw a large diagram of the bladder wrack seaweed shown in Fig. 3.1.

View solution

[4]

(ii) Line **PQ** on Fig. 3.1 represents the length of one bladder on the bladder wrack seaweed.

View solution

The actual length of the bladder is 19 mm.

Measure the length of line **PQ** on Fig. 3.1.

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

Calculate the magnification of the photograph using the formula and your measurement.

$$\text{magnification} = \frac{\text{length of line } \mathbf{PQ}}{\text{actual length of the bladder}}$$

Give your answer to **two** decimal places.

Space for working.

.....
[3]

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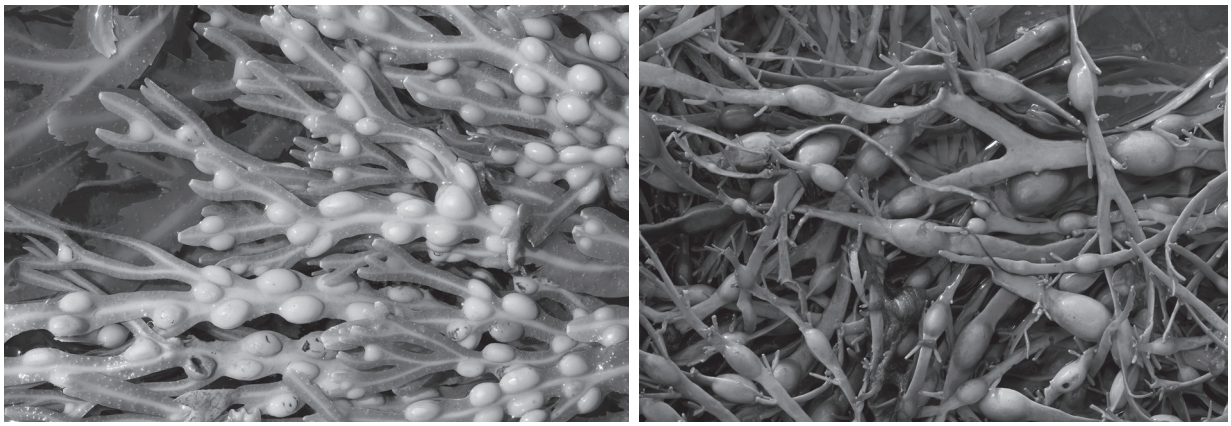
(iii) Seaweeds are species of algae that live in the sea. Fig. 3.2 shows photographs of bladder wrack seaweed and a different species of seaweed called egg wrack. The photographs are the same magnification.



bladder wrack egg wrack

View solution

Fig. 3.2

State **two** ways, visible in Fig. 3.2, that bladder wrack is different from egg wrack.

1 .....

.....

2 .....

.....

[2]

(b) Bladder wrack is found on the seashore and is exposed to the air when it is not covered by water at certain times of day.

Students investigated how rapidly bladder wrack lost water. They used this method:

- Three samples of bladder wrack were collected.
- The samples were blotted with tissue to remove any water on the surface of the seaweed.
- The initial mass of each sample was recorded.
- The samples were hung from a piece of string stretched between two stands.
- The mass of each sample was recorded every 30 minutes for the first two hours and then every hour for a further three hours.

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(i) Suggest **two** variables that the students should keep constant during their investigation to ensure that the results are valid.

1 .....

2 .....
[2]

Table 3.1 shows the initial masses recorded by the students and the final masses recorded after five hours.

View solution

Table 3.1

sample	initial mass of bladder wrack / g	final mass of bladder wrack / g
1	178	82
2	184	144
3	167	70
mean	176	76

(ii) One of the final masses recorded is anomalous.

State what is meant by an anomalous result.

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..... [1]

(iii) Describe how the students calculated the mean value for the final mass of the bladder wrack.

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.....

..... [1]

(iv) Using the information in Table 3.1, calculate the mean percentage decrease in the mass of the bladder wrack samples after five hours.

Give your answer to **two** significant figures.

Space for working.

..... %
[2]

(c) The students repeated their investigation using egg wrack seaweed.

Table 3.2 shows the mean percentage decrease in the mass of the egg wrack samples throughout the investigation.

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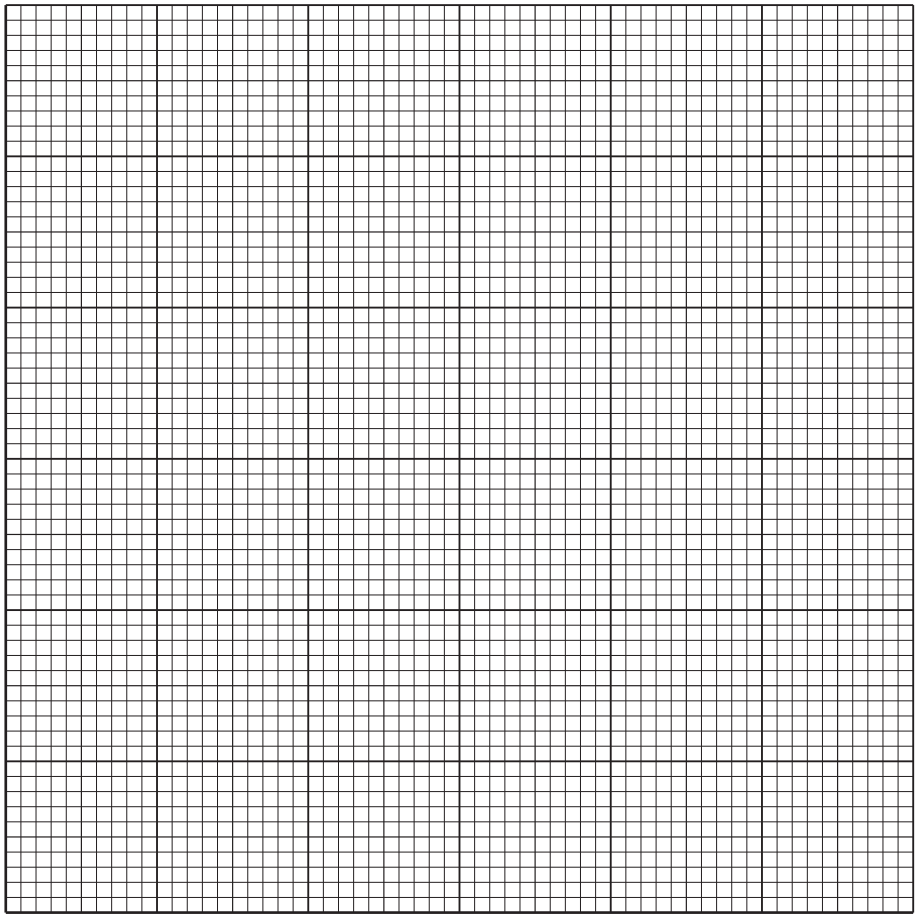
Table 3.2

time / minutes	mean percentage decrease in the mass of the egg wrack
30	0
60	13
90	22
120	27
180	38
240	46
300	51

Using the data in Table 3.2, plot a line graph on the grid to show the effect of time on the mean percentage decrease in the mass of the egg wrack.



[4]

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(d) Many people eat seaweed.

State the names of the reagents that can be used to test seaweed for protein and vitamin C.

protein .....

vitamin C .....
[2]

[Total: 21]

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