Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

9851497315

BIOLOGY **0610/52**

Paper 5 Practical Test **February/March 2020**

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	
Total	

This document has **12** pages. Blank pages are indicated.

1 **(a)** Beetroot is the large fleshy root of a beet plant. The cells of beetroot contain a coloured pigment. This pigment may leak from the cells if the cell membranes are damaged.

You are going to investigate the effect of temperature on the leakage of pigment from beetroot cells.

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)(i).

You should wear the gloves and eye protection provided during the practical work.

Step 1 You are provided with two beetroot cylinders. Place each of these onto the white tile and use the scalpel to cut both cylinders to 3 cm in length.

Step 2 Label one test-tube **C** and the other test-tube **H**. Place the test-tubes in the test-tube rack.

Step 3 Put one beetroot cylinder into test-tube **C**.

Step 4 Pour sufficient cold water into test-tube **C** so that the water level is just above the beetroot cylinder.

Step 5 Raise your hand when you are ready for hot water to be put into the beaker labelled **hot water**.

Step 6 Put one beetroot cylinder into test-tube **H**.

Step 7 Pour sufficient hot water into test-tube **H** so that the water level is just above the beetroot cylinder.

Step 8 Measure the temperature of the water in test-tube **C** and in test-tube **H**. Record these temperatures in your table in **1(a)(i)**.

Step 9 Place a stopper in each test-tube.

Step 10 Start the stop-clock. Leave the test-tubes for 10 minutes.

Continue with the rest of the questions while you are waiting.

Step 11 After 10 minutes shake both test-tubes for 5 seconds.

Step 12 Remove the stopper from test-tube **C**. Pour the contents of test-tube **C** into an empty beaker. Use the forceps to remove the beetroot cylinder and place it on the white tile.

Step 13 Pour the liquid in the beaker back into test-tube **C**.

Step 14 Repeat steps 12 and 13 using test-tube **H**.

Step 15 Observe the colour of the liquid in test-tube **C** and test-tube **H**. Record your observations in your table in **1(a)(i)**.

(i) Prepare a table to record your results.

[4]

(ii) State a conclusion for these results.

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..... [1]

(iii) In step 1 you were instructed to cut the beetroot cylinders to the same length.

Suggest why this was necessary.

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..... [1]

(iv) Identify **one** possible source of error in step 4 and step 7.

Suggest a piece of apparatus that could be used to reduce this error.

error .....

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apparatus .....

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[2]

(v) Suggest the purpose of step 11.

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..... [1]

(b) A student repeated the investigation in **1(a)** at five different temperatures. They carried out three trials at each temperature.

The student measured the percentage of light that passed through the liquids in the test-tubes.

The coloured pigment reduces the percentage of light that can pass through the liquid. The higher the pigment concentration the less light passes through the liquid.

The student's results are shown in Table 1.1.

Table 1.1

temperature / °C	percentage of light that passes through the liquid			
	trial 1	trial 2	trial 3	average
10	100	99	98	99
20	94	48	96	95
40	80	77	77	78
60	26	30	31	29
90	1	2	0	1

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

..... [1]

(ii) Suggest **two** ways in which the method described in **1(b)** is an improvement on the method that you used in **1(a)**.

1 .....

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2 .....

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[2]

(iii) The student decided that the result for trial 2 at 20 °C was anomalous.

State what is meant by an anomalous result.

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..... [1]

(iv) State how the student dealt with the anomalous result when calculating the average value for 20 °C.

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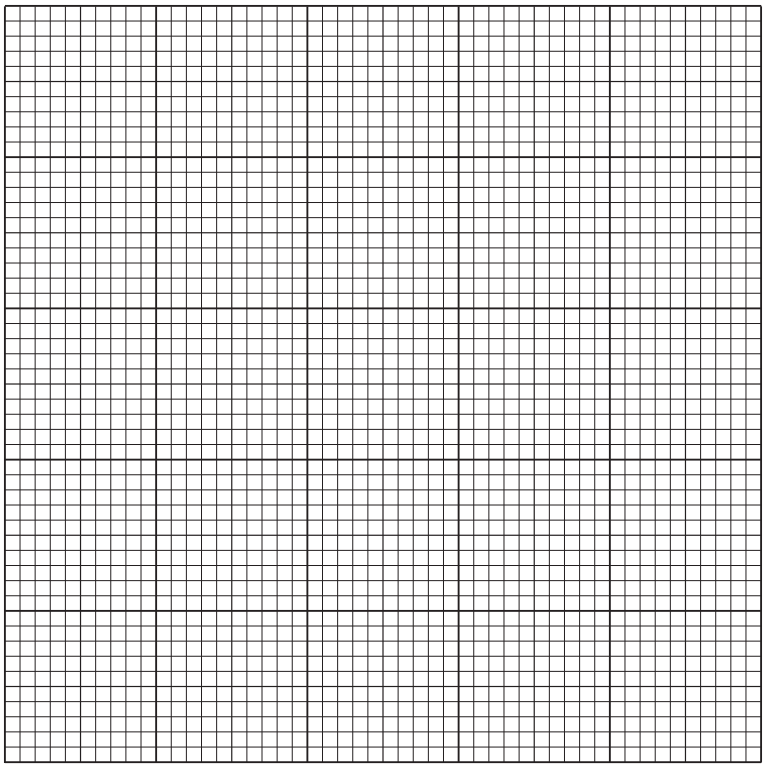
..... [1]

(v) Plot a line graph on the grid of the temperature against the average percentage of light that passes through the liquid using the data in Table 1.1.



[4]

(vi) Estimate the percentage of light passing through the liquid at 50 °C.

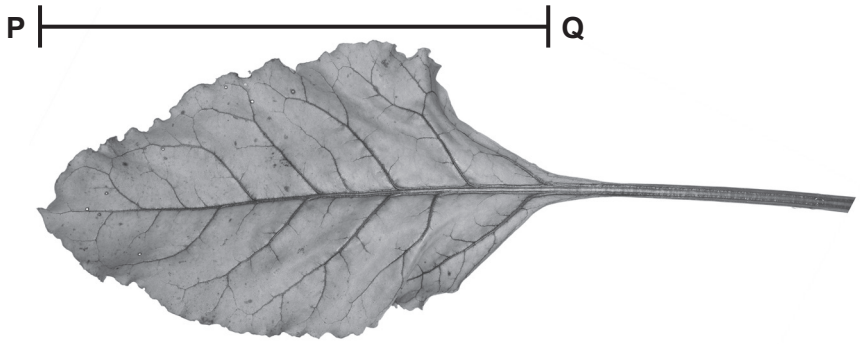
Show on your graph how you obtained your estimate.

.....%
[2]

[Total: 20]

[Turn over

2 Fig. 2.1 is a photograph of a leaf from a beet plant.



magnification ×1.2

Fig. 2.1

(a) (i) Make a large drawing of the leaf shown in Fig. 2.1.

[4]

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

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

Calculate the actual length of the leaf using the formula and your measurement.

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

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

Space for working.

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[3]

(b) Some athletes drink beetroot juice because they think it improves their performance.

Scientists investigated the effect of drinking 100 cm^3 of beetroot juice on the length of time that athletes were able to run at their fastest pace before stopping due to exhaustion.

The results of the investigation are shown in Fig. 2.2.

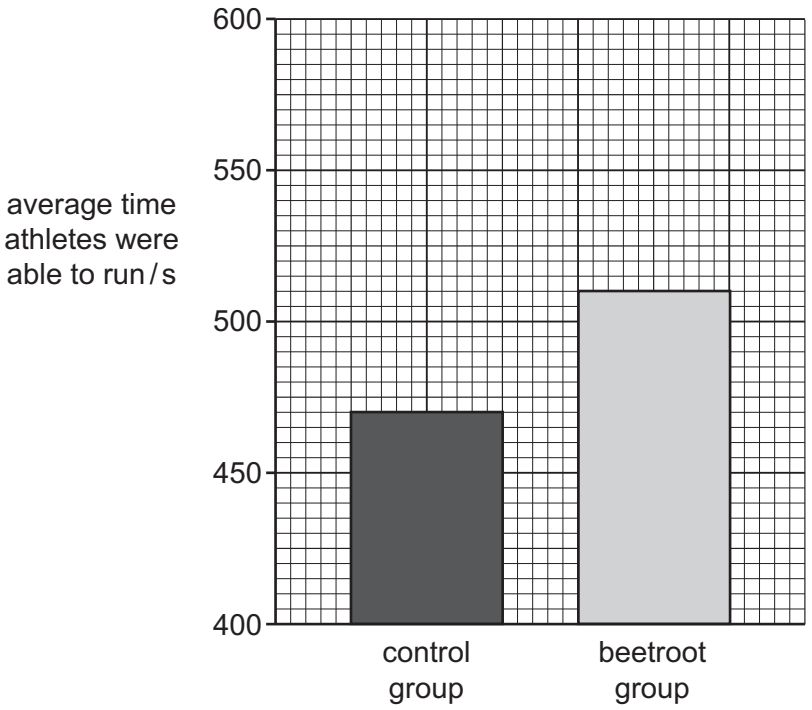

Fig. 2.2

(i) Explain why a control group was used in this investigation.

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..... [1]

(ii) Suggest a suitable control experiment for this investigation.

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..... [1]

(iii) Calculate the percentage increase in the average time athletes were able to run for the beetroot group compared to the control group.

Give your answer to one decimal place.

Space for working.

.....%
[2]

(c) An athlete suggested the hypothesis:

'Drinking a greater volume of beetroot juice would increase the length of time that athletes are able to run.'

Plan an investigation to test this hypothesis.

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..... [6]

(d) Athletes often consume energy drinks.

Describe how you could test a sample of an energy drink to determine if reducing sugars are present.

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..... [3]

[Total: 20]

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