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CAMBRIDGE
International Education

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CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

5186908449

BIOLOGY **0610/52**

Paper 5 Practical Test **May/June 2026**

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. Do **not** use correction fluid or tape.
- 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. Any blank pages are indicated.

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1 You are going to estimate the concentration of vitamin C in a drink by comparing it to solutions with known vitamin C concentrations.

The concentration of vitamin C in a sample can be estimated by testing it with iodine solution. The test is done by adding drops of iodine solution to the sample until the colour remains blue-black.

The greater the volume of iodine solution added, the higher the concentration of vitamin C in the sample.

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)(ii).

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

(a) You are going to test solutions with known vitamin C concentrations.

step 1 Label three beakers **V1**, **V2** and **V3**.

step 2 Use the volumes of 0.6% vitamin C solution **V** and distilled water **W** shown in Table 1.1 to make up the different concentrations of vitamin C.

(i) Complete Table 1.1 by writing in the final percentage concentration of vitamin C in test-tube **V3**.

Table 1.1

beaker	volume of 0.6% vitamin C solution V / cm^3	volume of distilled water W / cm^3	final percentage concentration of vitamin C solution
V1	12	0	0.6
V2	8	4	0.4
V3	4	8	.....

[1]

step 3 Label three test-tubes **V1**, **V2** and **V3**.

step 4 Use a 1 cm^3 syringe to put 1 cm^3 of **starch suspension** into each test-tube.

step 5 Add 1 cm^3 of the vitamin C solution from beaker **V1** to test-tube **V1**.

step 6 Add 1 cm^3 of the vitamin C solution from beaker **V2** to test-tube **V2**.

step 7 Add 1 cm^3 of the vitamin C solution from beaker **V3** to test-tube **V3**.

step 8 Fill a clean 5 cm^3 syringe with 5 cm^3 of iodine solution.

step 9 Use the syringe to add a drop of iodine solution to test-tube **V1** and shake gently to mix.

step 10 Continue adding drops of iodine solution and shaking until the mixture remains a blue-black colour or until the syringe is empty.

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step 11 Record in your table in **1(a)(ii)** the volume of iodine solution **remaining** in the syringe. If the syringe is empty record the volume as **0.0**.

step 12 Repeat step 8 to step 11 with test-tube **V2** and test-tube **V3**.

(ii) Prepare a table and record your results to the nearest 0.1 cm^3.

Include the final percentage concentrations of the vitamin C solutions in your table.

[4]

(iii) Calculate the volume of iodine solution **added** to each test-tube.

Use the formula shown:

volume added = 5.0 – the volume remaining in the syringe

test-tube **V1** ..... cm^3

test-tube **V2** ..... cm^3

test-tube **V3** ..... cm^3

[1]

(iv) State the dependent variable in this investigation.

..... [1]

(v) Explain why a blue-black colour was seen when iodine solution was added.

.....

..... [1]

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(vi) Identify **one** source of error in this investigation and suggest an improvement.

error .....

.....

improvement .....

.....

[2]

(b) You are going to estimate the vitamin C concentration in drink **D**.

step 13 Label a test-tube **D**.

step 14 Put 1 cm^3 of starch suspension into the test-tube.

step 15 Add 1 cm^3 of drink **D** to the test-tube.

step 16 Fill a clean syringe with 5 cm^3 of iodine solution.

step 17 Use the syringe to add a drop of iodine solution to test-tube **D** and shake gently to mix.

step 18 Continue adding drops of iodine solution and shaking until the mixture remains a blue-black colour or until the syringe is empty.

(i) Complete the calculation to estimate the vitamin C concentration in drink **D**.

- Record the volume of iodine solution remaining in the syringe.

volume remaining = ... cm^3

- Calculate the volume of iodine solution added to test-tube **D**.

volume added = ... cm^3

- Use Table 1.1 and your answers in **1(a)(iii)** to estimate the vitamin C concentration in drink **D**.

estimated vitamin C concentration in drink **D** = ... %

[2]

(ii) Describe one modification to the procedure in **1(a)** that would allow you to have more confidence in your estimate in **1(b)(i)**.

.....

.....

..... [1]

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(iii) The manufacturer of a drink claims that it does **not** contain reducing sugars.

Describe a test that would confirm the presence of reducing sugars.

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..... [2]

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(c) Kiwi fruit is a good source of vitamin C. Fresh kiwi fruit has a high water content which can be reduced by drying.

A student investigated the effect of drying time on the vitamin C concentration of kiwi fruit.

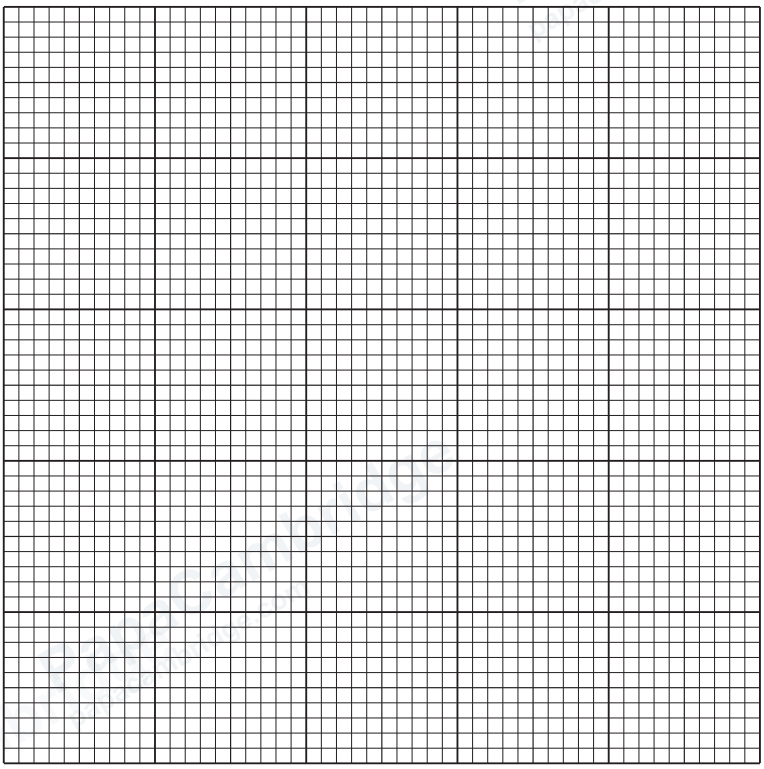
The student dried the fruits in an oven and tested samples for vitamin C at regular intervals.

The results are shown in Table 1.2.

Table 1.2

drying time / hours	vitamin C concentration / mg per 100 g of kiwi fruit
0	90
4	125
8	185
12	230
16	230

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



[4]

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(ii) Describe **and** explain the change in the vitamin C concentration in the kiwi fruit in Table 1.2.

.....

.....

.....

.....

..... [2]

(iii) Use your graph to estimate the vitamin C concentration in kiwi fruit that has been dried for 10 hours.

Indicate **on your** graph how you obtained your answer.

..... mg per 100 g of kiwi fruit [2]

[Total: 23]

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2 **(a)** Figure 2.1 is a photograph of three beans in a pod.



Figure 2.1

(i) Draw a large diagram of the three beans and the pod shown in Figure 2.1.

[4]

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(ii) Line **PQ** represents the length of one of the beans in Figure 2.1.

Measure the length of line **PQ**.

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

The actual length of the bean is 19 mm.

Using your measurement and the formula, calculate the magnification of the bean in Figure 2.1.

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

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

Space for working.

.....

[3]

(b) A student investigated the effect of temperature on the time taken for beans to germinate.

The student:

- planted 200 beans in trays containing soil, and kept them at 10 °C
- added 45 cm^3 of water to the trays each day
- recorded the time when each bean started to germinate
- calculated the mean time for germination
- repeated the procedure at 20 °C, 30 °C, 40 °C and 50 °C.

(i) Identify the independent variable in this investigation.

..... [1]

(ii) Identify **one** variable that was kept constant in this investigation.

..... [1]

(iii) Suggest why the student planted so many beans.

.....

.....

..... [1]

(iv) State the most appropriate piece of apparatus for measuring 45 cm^3 of water.

..... [1]

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(c) Beans contain the enzyme catalase. The age of the bean could affect the concentration of catalase it contains.

Catalase catalyses the breakdown of hydrogen peroxide to release water and oxygen gas.

Plan an investigation to determine if the age of the beans affects the **volume** of oxygen gas produced by this reaction.

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..... [6]

[Total: 17]

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