



# Cambridge IGCSE™

CANDIDATE  
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## BIOLOGY

0610/53

Paper 5 Practical Test

May/June 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	
<b>Total</b>	

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

1 You are going to investigate the nutrient content of three types of drink:

- drink **A**
- drink **B**
- drink **C**.

**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** Raise your hand when you are ready for hot water to be added to your hot water-bath for **Test 1**.

**Step 2** Test the drinks **A**, **B** and **C** using **Tests 1, 2 and 3**.

**Step 3** Record your observations in your table in **1(a)(i)**.

**Test 1 Testing for reducing sugars:**

- Label three test-tubes **A**, **B** and **C**.
- Put 1 cm<sup>3</sup> of drink **A** into test-tube **A**.
- Put 1 cm<sup>3</sup> of drink **B** into test-tube **B**.
- Put 1 cm<sup>3</sup> of drink **C** into test-tube **C**.
- Add 1 cm<sup>3</sup> of Benedict's reagent to each test-tube.
- Put all three test-tubes into the hot water-bath prepared in Step 1.
- Start the stop-clock and leave the test-tubes in the water-bath for five minutes.
- After five minutes, remove the test-tubes from the water-bath and place them in the test-tube rack.

**Test 2 Testing for starch:**

- Place two drops of each drink onto a white tile.
- Add two drops of iodine solution to each drink sample.

**Test 3 Testing for protein:**

- Label three test-tubes **A**, **B**, and **C**.
- Put 1 cm<sup>3</sup> of drink **A** into test-tube **A**.
- Put 1 cm<sup>3</sup> of drink **B** into test-tube **B**.
- Put 1 cm<sup>3</sup> of drink **C** into test-tube **C**.
- Add 1 cm<sup>3</sup> of biuret reagent to each drink sample.

(a) (i) Prepare a table to record your **observations** for all of the tests.

Do **not** include conclusions in your table.

[5]

(ii) Using your results in 1(a)(i), state which nutrients are present in each drink.

drink A .....

drink B .....

drink C .....

[3]

(iii) Identify **one** safety hazard associated with **Test 1**.

.....  
.....  
.....

[1]

(b) The vitamin C content and the fat content of three other drinks **D**, **E** and **F** was determined.

It was found that:

- Drink **D** contained vitamin C.
- Drink **E** contained fat.
- Drink **F** contained vitamin C and fat.

(i) State the reagent used when testing for vitamin C.

..... [1]

(ii) Describe the method for the emulsion test for fats.

.....  
.....  
.....  
.....  
.....

[2]

(iii) The results for **one** of the drinks is shown in Table 1.1.

**Table 1.1**

test	observation
vitamin C	the solution is colourless
fat	a white emulsion has formed

Identify the drink from the results provided in Table 1.1.

drink .....

[1]

(iv) Explain how you identified the drink from the results provided in Table 1.1.

.....  
.....  
.....

[1]

(c) Three types of food contain different concentrations of the enzyme catalase.

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



The production of oxygen gas can be used to measure the activity of the enzyme.

Plan an investigation to compare the concentrations of catalase in the three types of food.

[6]

[Total: 20]

2 (a) The nutrient content of foods can affect a person's bones.

In a study, the diet and bone density of 120 women were monitored for two years. The women were all between 50 and 70 years of age.

The scientists:

- calculated the mean daily calcium intake for each woman
- measured the change in density of one of their bones by using X-ray scans.

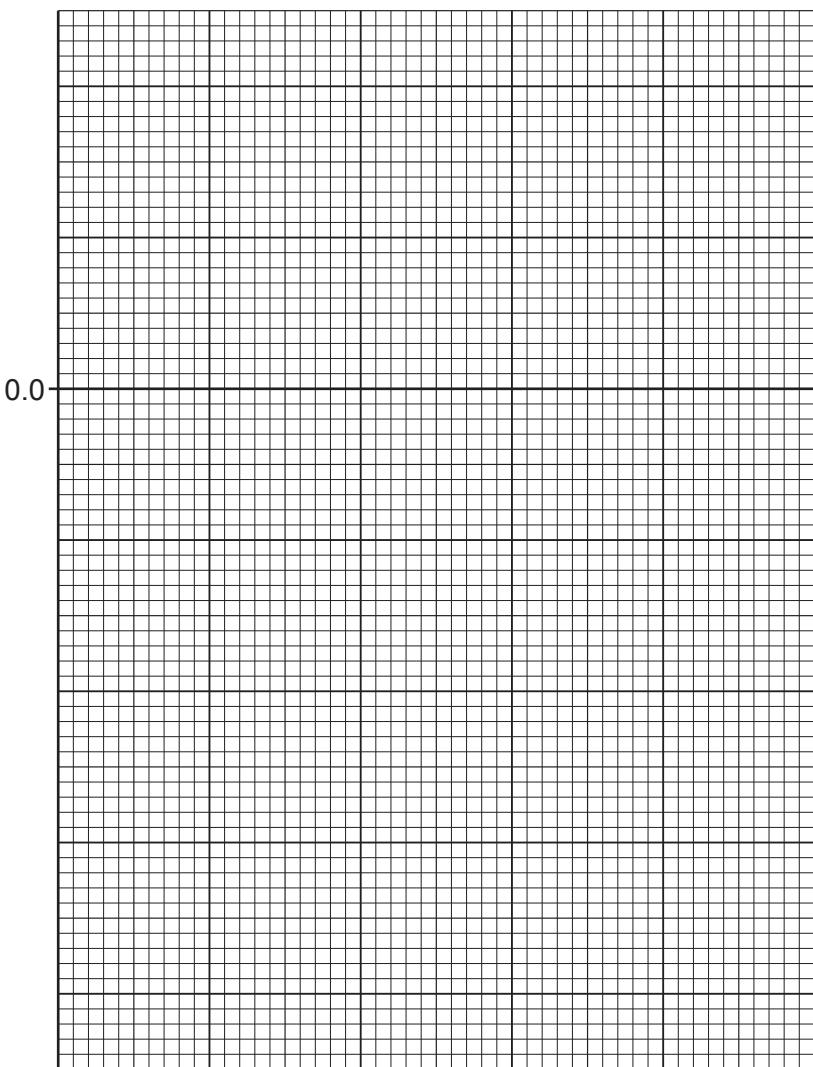
The results for five of the women are shown in Table 2.1.

**Table 2.1**

mean daily calcium intake for each woman /mg per day	mean change in bone density /mg per cm <sup>2</sup> per year
250	-8.6
750	-5.4
1250	-1.2
1750	+1.2
2250	+4.2

(i) Plot a line graph on the grid of the data in Table 2.1.

One axis has been started for you.



[4]

(ii) State **two** conclusions for the data in your graph.

1 .....

.....

.....

2 .....

.....

.....

[2]

(iii) Identify the independent variable in this investigation.

..... [1]

(iv) Describe **two** variables that the scientists should have considered when selecting women for the study.

1 .....

.....

2 .....

.....

[2]

(v) Suggest a reason for a large number of women (120) being included in the study.

.....

.....

..... [1]

(vi) State **one** way this study is **not** representative of the population.

.....

.....

..... [1]

**Question 2 continues on page 10.**

(b) Fig. 2.1 is a photograph of a femur, which is a bone in the leg.



**Fig. 2.1**

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

[4]

(ii) The length of line **PQ** represents the length of the femur in Fig. 2.1.

Measure the length of line **PQ** on Fig. 2.1.

length of line **PQ** on Fig. 2.1 ..... mm

Use your measurement and the formula to calculate the actual length of the bone.

$$\text{magnification} = \frac{\text{length of line } \mathbf{PQ} \text{ on Fig. 2.1}}{\text{actual length of the bone}}$$

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

Space for working.

..... mm  
[3]

(iii) Fig. 2.2 shows a bone from a person who had vitamin D deficiency.



magnification  $\times 0.3$

**Fig. 2.2**

State **two** ways the bone in Fig. 2.2 is different from the bone in Fig. 2.1.

1 .....

.....

2 .....

.....

[2]

[Total: 20]

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