Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

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	
Total	

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

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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^3 of drink **A** into test-tube **A**.
- Put 1 cm^3 of drink **B** into test-tube **B**.
- Put 1 cm^3 of drink **C** into test-tube **C**.
- Add 1 cm^3 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^3 of drink **A** into test-tube **A**.
- Put 1 cm^3 of drink **B** into test-tube **B**.
- Put 1 cm^3 of drink **C** into test-tube **C**.
- Add 1 cm^3 of biuret reagent to each drink sample.

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

View solution

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

[5]

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

View solution

drink **A** .....

drink **B** .....

drink **C** .....

[3]

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

View solution

.....

.....

..... [1]

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

It was found that:

View solution

- 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.

View solution

.....

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.....

..... [2]

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

View solution

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.

View solution

.....

.....

..... [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:

hydrogen peroxide → water + oxygen

View solution

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.

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.....

..... [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^2 per year
250	–8.6
750	–5.4
1250	–1.2
1750	+1.2
2250	+4.2

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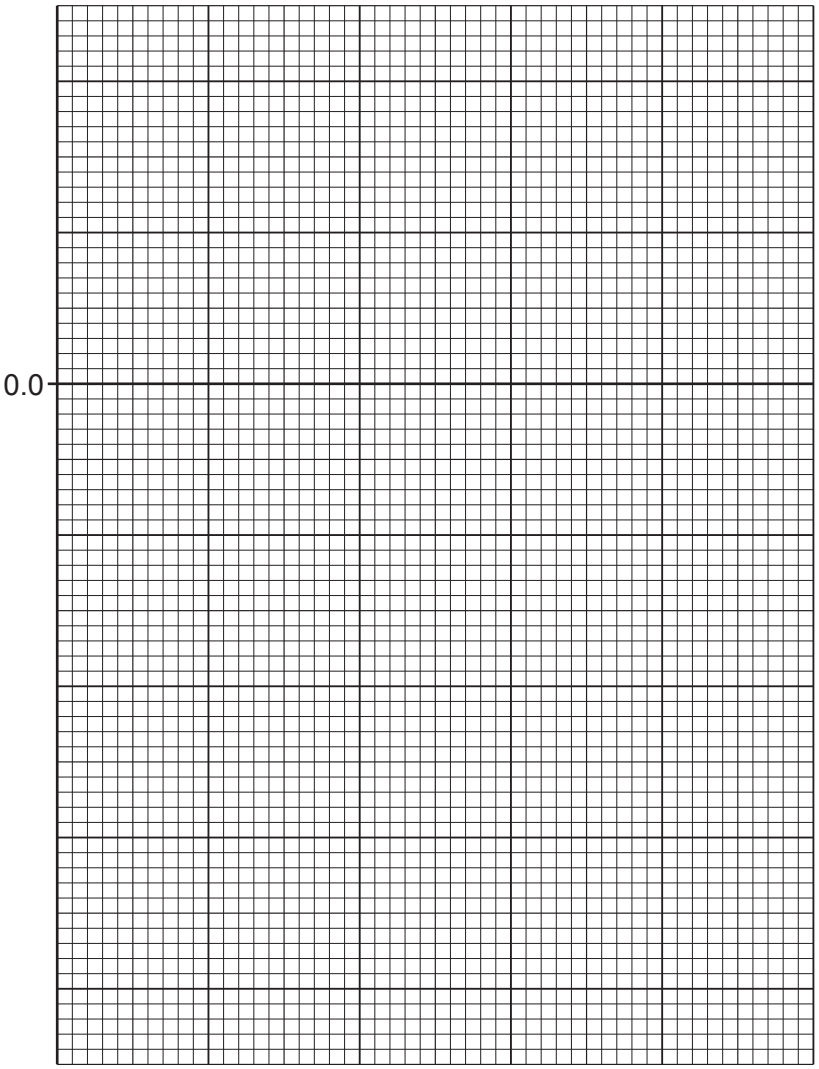
(i) Plot a line graph on the grid of the data in Table 2.1.

View solution

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]

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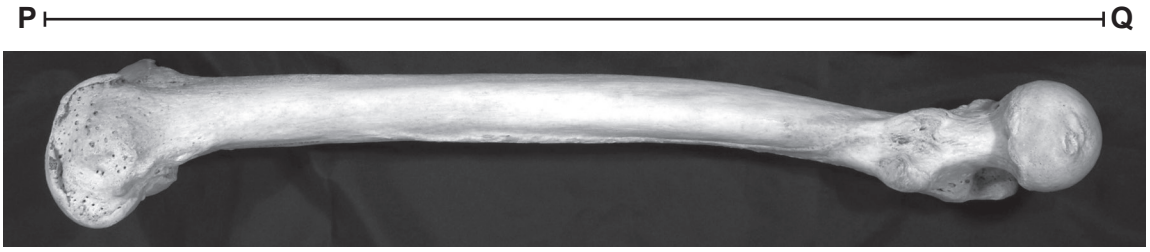
Question 2 continues on page 10.

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

View solution



magnification ×0.3

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.

View solution

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.

View solution



magnification ×0.3

Fig. 2.2

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

1 .....

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2 .....

.....
[2]

[Total: 20]

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