



CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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0610/53

May/June 2023

1 hour 15 minutes

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

- 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.

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 cm³ of drink **A** into test-tube **A**.
- Put 1 cm³ of drink **B** into test-tube **B**.
- Put 1 cm³ of drink **C** into test-tube **C**.
- Add 1 cm³ 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 cm³ of drink **A** into test-tube **A**.
- Put 1 cm³ of drink **B** into test-tube **B**.
- Put 1 cm³ of drink **C** into test-tube **C**.
- Add 1 cm³ 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.

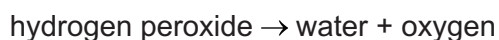
.....

.....

..... [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.

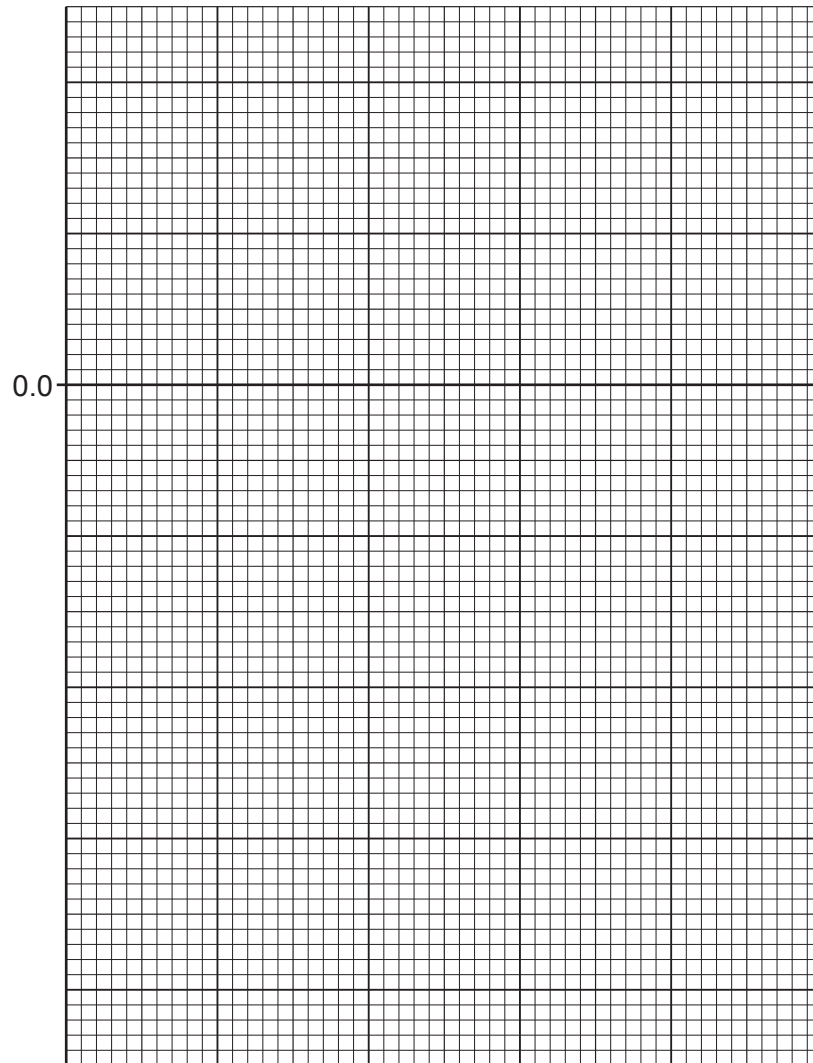
The results for five of the women are shown in Table 2.1.

Table 2.1

mean daily calcium intake for each woman /mg per day	mean change in bone density /mg per cm ² 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.

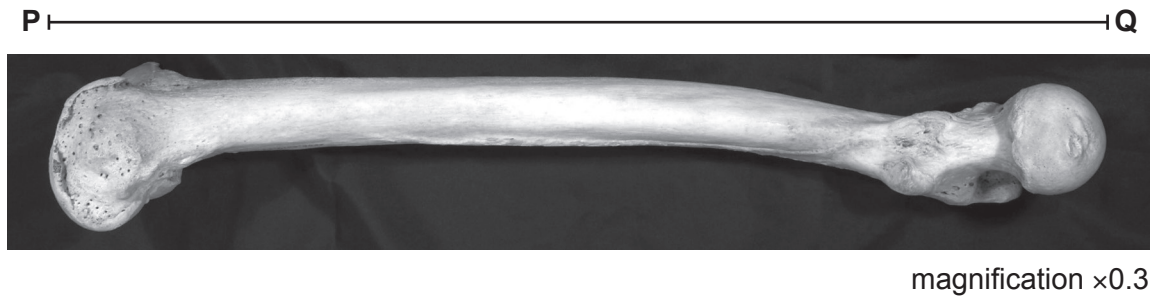


Fig. 2.1

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

- (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.

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

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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