



General Certificate of Secondary Education
2023–2024

Centre Number

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Candidate Number

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Double Award Science: Biology

Unit B1
Foundation Tier



[GDW11]

GDW11

FRIDAY 17 MAY 2024, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all eight** questions.

INFORMATION FOR CANDIDATES

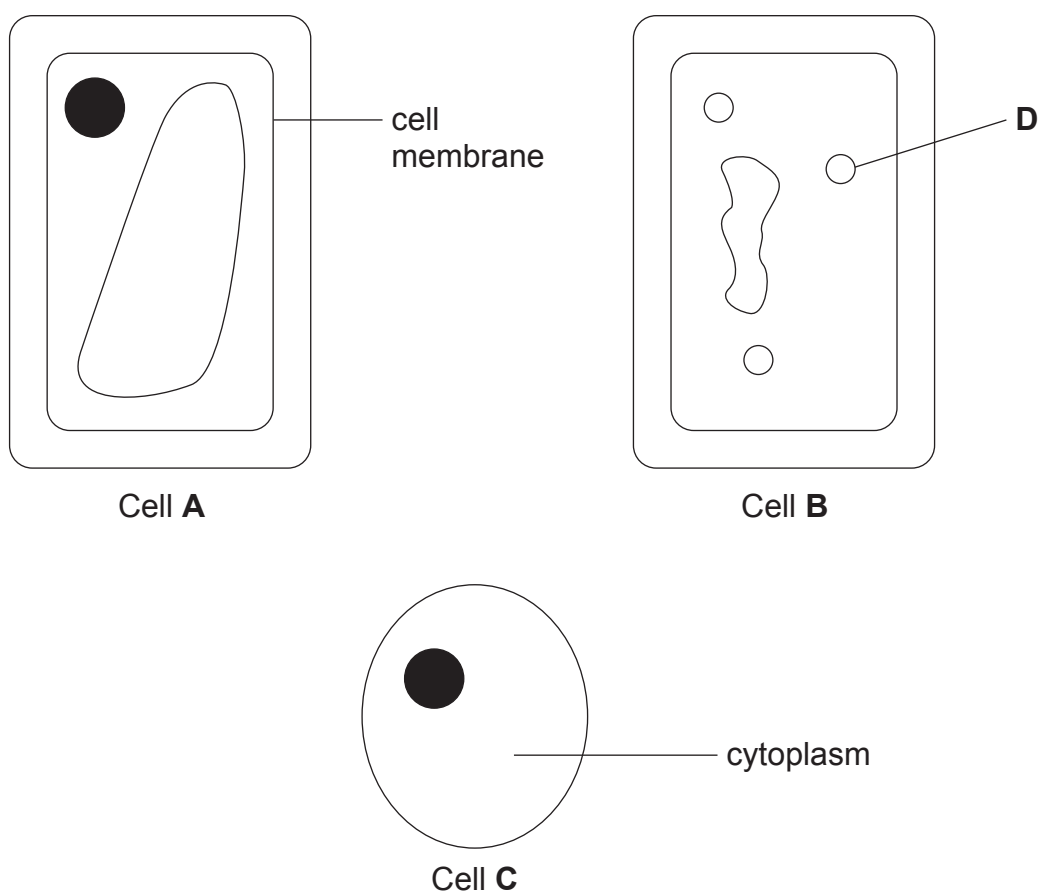
The total mark for this paper is 60.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question 7.



- 1 A plant cell, a bacterial cell and an animal cell are shown in the diagram.



- (a) Name the structure present in cell **A** and cell **C** but **absent** from cell **B**.

[1]

- (b) Name structure **D**.

[1]

- (c) Give **two** structures present in cell **A** that show it is a **plant** cell.

1. _____

2. _____

[2]



2 The names of some biological molecules are given in the list.

amino acids	glucose	fatty acids	protein
cellulose	glycerol	starch	lactose

Give the names of the **two** biological molecules in the list that:

(a) are simple carbohydrates

_____ and _____ [2]

(b) make up fats

_____ and _____ [2]

(c) are found in plant cells but **not** animal cells

_____ and _____ [2]

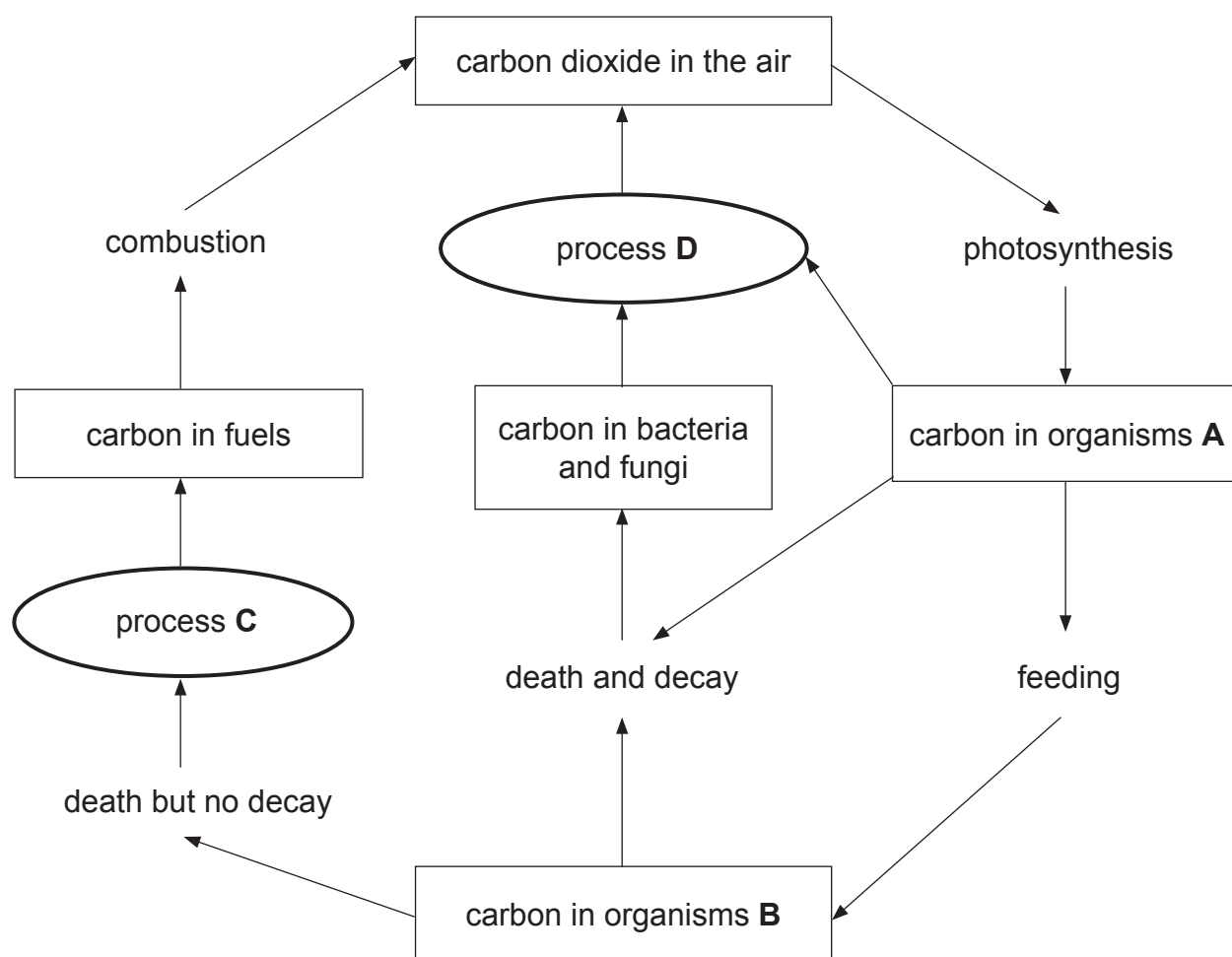
(d) turn Biuret reagent from blue to lilac/purple.

_____ and _____ [2]

[Turn over



3 The diagram shows part of the carbon cycle.



(a) Carbon is found in organisms **A** and **B**.

Name the types of organisms **A** and **B**.

A _____

B _____

[2]



(b) Which organisms carry out decay in the carbon cycle?

_____ [1]

(c) Name process C.

_____ [1]

(d) Name process D.

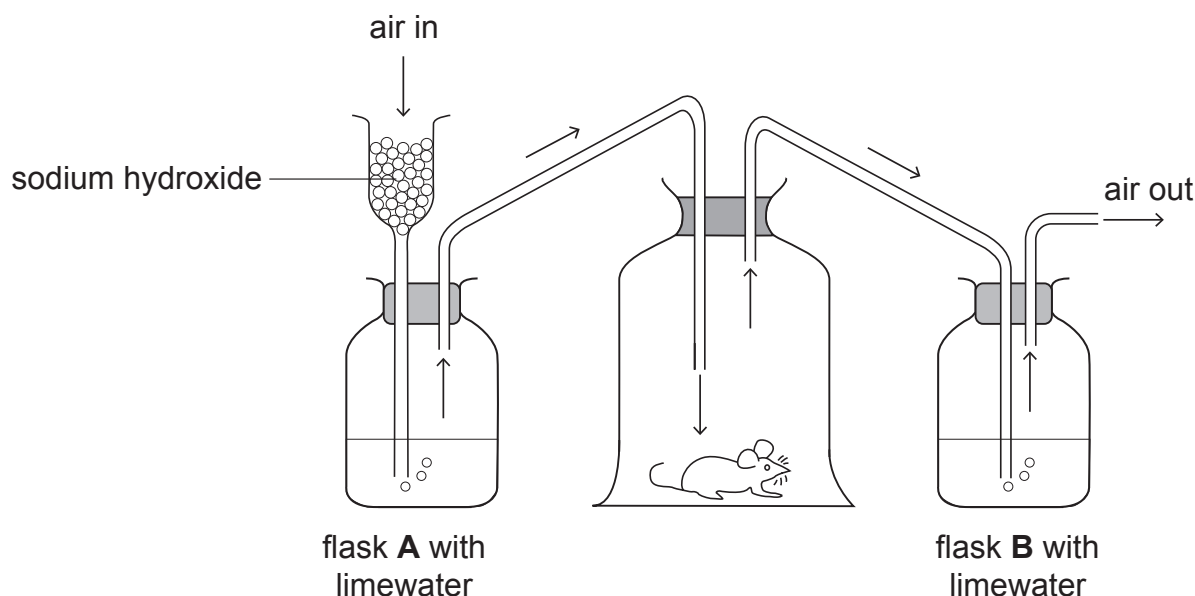
_____ [1]

[Turn over



- 4 A scientist set up an investigation into respiration in a mouse using the apparatus shown in the diagram.

Limewater is a colourless solution which turns cloudy when the levels of carbon dioxide increase.



The limewater in flask A remains colourless throughout the investigation.

- (a) (i) Give the role of sodium hydroxide in this investigation.

Circle the correct answer in the list.

adds carbon
dioxide

adds
oxygen

removes carbon
dioxide

removes
oxygen

[1]

- (ii) Suggest the role of the **limewater** in flask A.

[1]



(b) Describe and explain the appearance of the limewater in flask **B** after 5 minutes.

Description _____

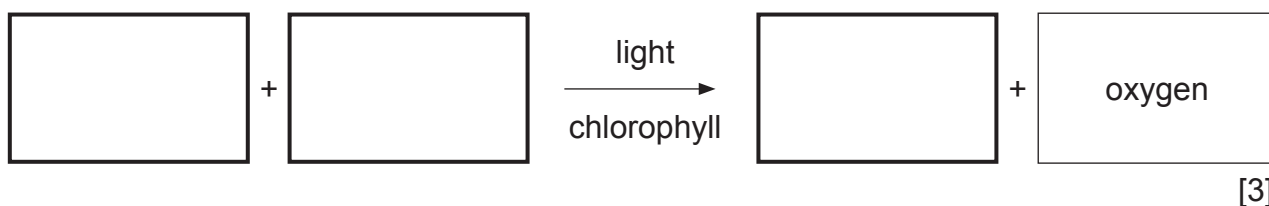
Explanation _____

[3]



5 Photosynthesis is a process carried out in green plants.

(a) Complete the word equation for photosynthesis by writing in the empty boxes.



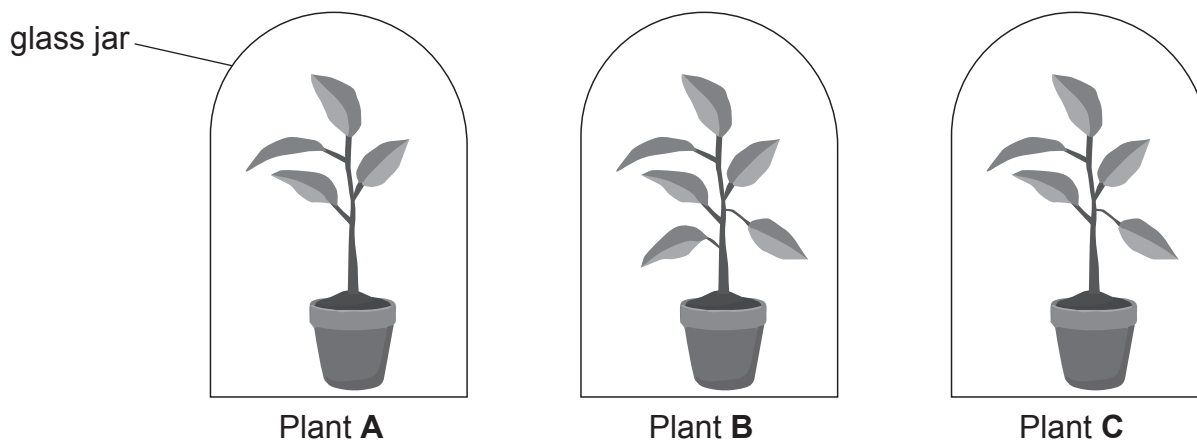
(b) A student carried out an investigation into photosynthesis using three different plants **A**, **B** and **C**. The three plants were all the same type of plant.

He placed each plant inside a glass jar and used an oxygen probe to measure the concentration of **oxygen** inside each jar:

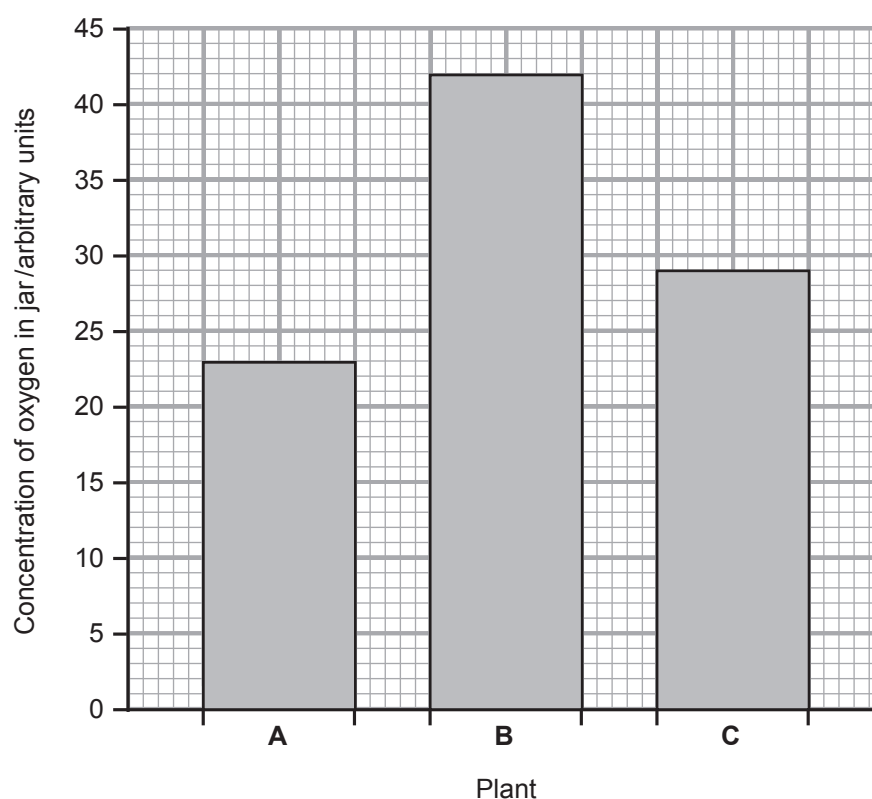
- at the start of the investigation and
- after 30 minutes in bright light.

The concentration of **oxygen** inside each jar at the **start** of the investigation was **20** arbitrary units.

The diagram shows the set-up of his investigation.



The bar chart shows the student's results at the **end** of the investigation.



The concentration of oxygen at the **start** of the investigation was **20** arbitrary units, in all three jars.

- (i) Calculate the **increase** in the concentration of oxygen in the jar containing plant **B** between the start and end of the investigation.

Show your working.

_____ arbitrary units [2]

[Turn over



(ii) Describe and explain the student's results for plant **A**.

Circle the correct answer in **each** column.

Plant A produced	Plant A had	Plant A carried out
3 units of oxygen	more leaves than the other plants	less photosynthesis than the other plants
23 units of oxygen	the same number of leaves as the other plants	the same amount of photosynthesis as the other plants
9 units of oxygen	fewer leaves than the other plants	more photosynthesis than the other plants

[3]



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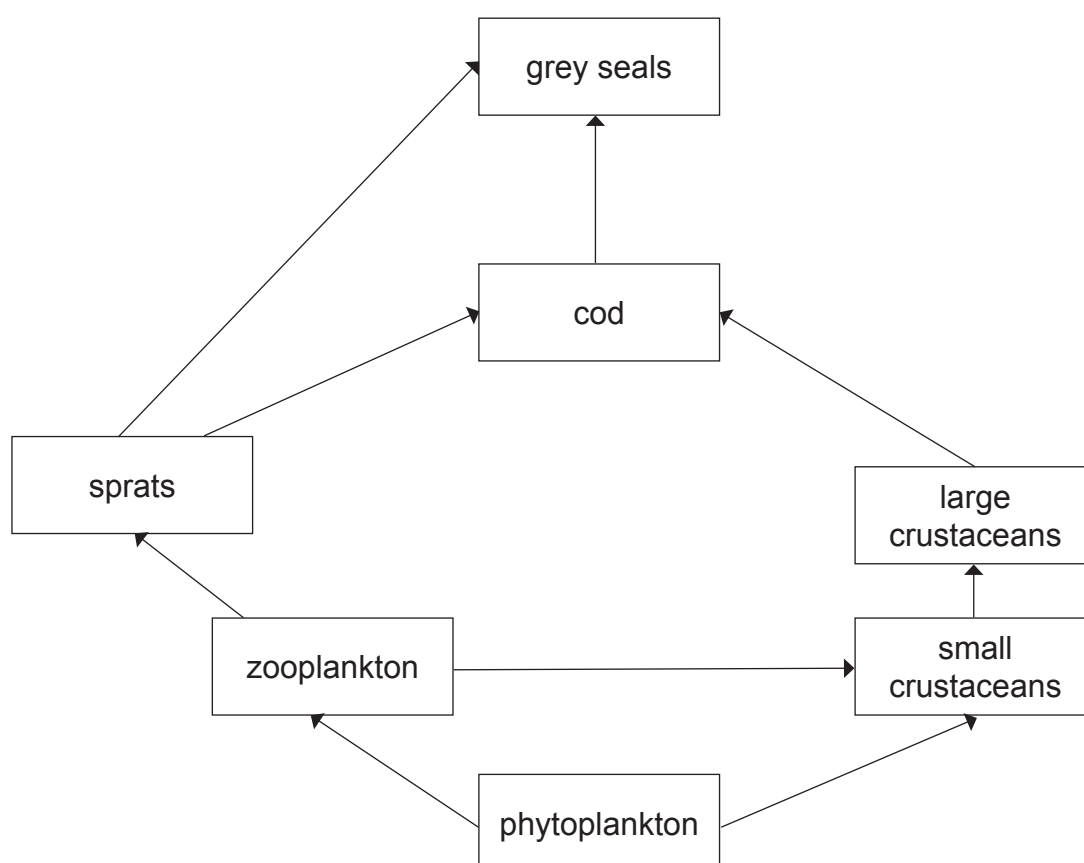
24GDW1111

- 6 Grey seals are a protected species that live in the seas around Ireland. Measures have been put in place to conserve the population of grey seals.

The photograph shows a grey seal.



- (a) The diagram shows a food web for grey seals. Cod is a type of fish that is eaten by people.



- (i) Complete the table by writing a tick (✓) in the empty boxes to show the correct position(s) for some types of organism in this food web.

Two of these types of organism feed at **two** positions in this food web.

Type of organism	Producer	Primary consumer	Secondary consumer	Tertiary consumer	Quaternary consumer
small crustaceans					
cod					
phytoplankton					
sprats					

[4]

- (ii) Name a type of organism in the food web that has only one food source.

[1]

The population of **small crustaceans** decreased suddenly.

- (iii) Explain why this could cause either:

- an increase in the phytoplankton population or
- a decrease in the phytoplankton population.

an increase in the phytoplankton population _____

a decrease in the phytoplankton population _____

[3]

[Turn over



(iv) Name the type of organism that competes with the cod for food.

[1]

(b) The number of grey seals in the seas around Ireland has been monitored for a number of years.

In 2003, 1309 grey seals were counted.

In 2017, 3698 grey seals were counted.

(i) Calculate the percentage (%) increase in the number of grey seals between 2003 and 2017.

Show your working.

Give your answer to the nearest whole number.

_____ % [4]

(ii) Suggest why some fishermen are against conservation measures that protect the grey seals.

[2]





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- 7 Root hair cells are specialised cells found in the roots of plants. They have adaptations to help them in their role.

- Name **one** structure, absent from root hair cells, that is present in palisade mesophyll cells in a leaf.
- Give the role of root hair cells.
- Describe and explain how root hair cells are adapted for their role.

In this question you will be assessed on the quality of your written communication skills, including the use of specialist scientific terms.

Structure absent from root hair cells _____

Role of root hair cells _____

Description and explanation of how root hair cells are adapted for their role

[6]





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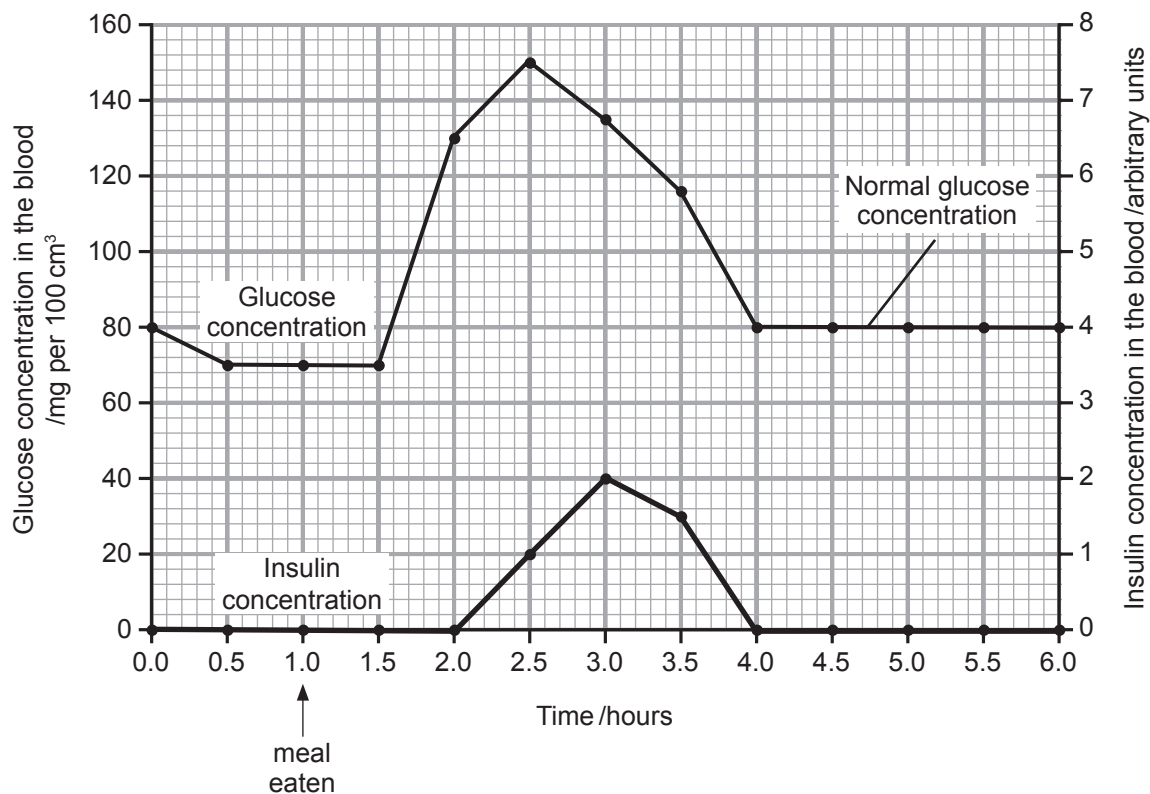
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- 8 The graphs show the glucose and insulin concentrations in the blood of a healthy woman before and after she ate a meal.

The y axis on the **left-hand** side shows the **glucose** concentration in the blood.
The y axis on the **right-hand** side shows the **insulin** concentration in the blood.



- (a) Use the graph to give the lowest glucose concentration in this woman's blood.

_____ mg per 100 cm³ [1]



- (b) Suggest why there is a time delay between the woman eating the meal and the glucose concentration in her blood increasing.

[2]

- (c) (i) Insulin was first released at 2 hours.
After insulin was first released, how long did it take for the glucose concentration in the woman's blood to return to normal?

_____ hours [1]

- (ii) Give **two** ways that insulin lowers the glucose concentration in the blood.

1. _____

2. _____

[2]

[Turn over



(d) Diabetes is a condition in which the blood glucose control mechanism fails.

- (i) Which of the following could help reduce the chances of a person developing Type 2 diabetes?

Circle the **two** correct answers in the list.

doing less exercise	doing the same amount of exercise	doing more exercise
consuming less sugar	consuming the same amount of sugar	consuming more sugar

[2]

- (ii) Diabetes can have long-term effects on the body.

Circle the long-term effect of diabetes in the list.

hair damage	kidney failure	muscle weakness
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[1]

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Sources:

Question 1: Principal Examiner

Question 3: Principal Examiner

Question 4: Principal Examiner

Question 5(b): Principal Examiner

Question 6: © Getty Images

Question 6(b): The Skipper 13th Feb 2020 Article the Fishermen and the Seals (by Niall Duffy)

Article 17 Reports National Parks and Wildlife Services Ireland p 598–604

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For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
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7	
8	

Total Marks	
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Examiner Number

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