



Rewarding Learning

General Certificate of Secondary Education
2022–2023

Centre Number

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Candidate Number

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Double Award Science: Biology

Unit B1

Foundation Tier



[GDW11]

GDW11

MONDAY 21 NOVEMBER 2022, 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.

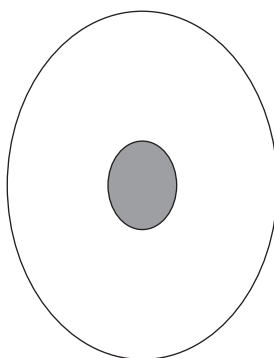
Quality of written communication will be assessed in Question 8.

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20GDW1101

1 The diagram shows a cell.



(a) Name this type of cell.

[1]

(b) The list gives some structures found in cells.

cell wall	cytoplasm	cell membrane
nucleus	chromosomes	vacuole

Choose the structure from the list that matches each function in the table.

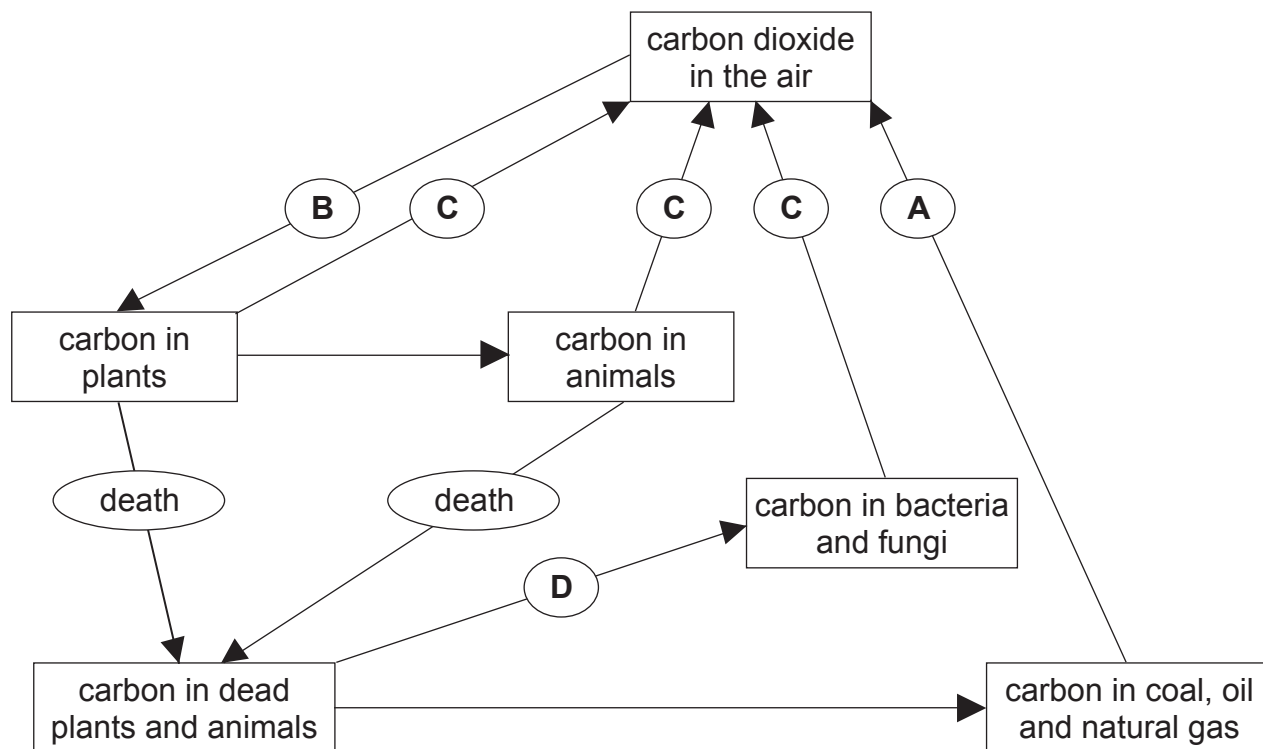
Write your answers in the empty boxes.

Function	Structure
Controls what substances enter and leave the cell.	
Where chemical reactions take place.	
Contains structures that determine the characteristics of an organism.	

[3]



- 2 The diagram shows the carbon cycle.
Some processes in the carbon cycle are labelled **A**, **B**, **C** and **D**.



- (a) Name processes **A**, **B** and **C**.

A _____

B _____

C _____

[3]

- (b) (i) Name process **D**, carried out by bacteria and fungi.

[1]

- (ii) Name the material in the soil formed from dead plants and animals, by bacteria and fungi.

[1]

[Turn over



- 3 Food tests can be used to identify biological molecules found in different foods.

Complete the table by writing in the empty boxes.

Biological molecule	Reagent	Initial colour	End colour for positive result
starch		yellow-brown	
	ethanol	colourless	
protein		blue	lilac/purple

[5]



4 (a) (i) What is an enzyme?

[2]

Enzymes are important in digestion. They join with substances known as substrates.

(ii) Use a ruler to draw a line to link each enzyme to its correct substrate.

Enzyme

Substrate

	glucose
amylase	protein
lipase	starch
protease	amino acids
	fat

[3]

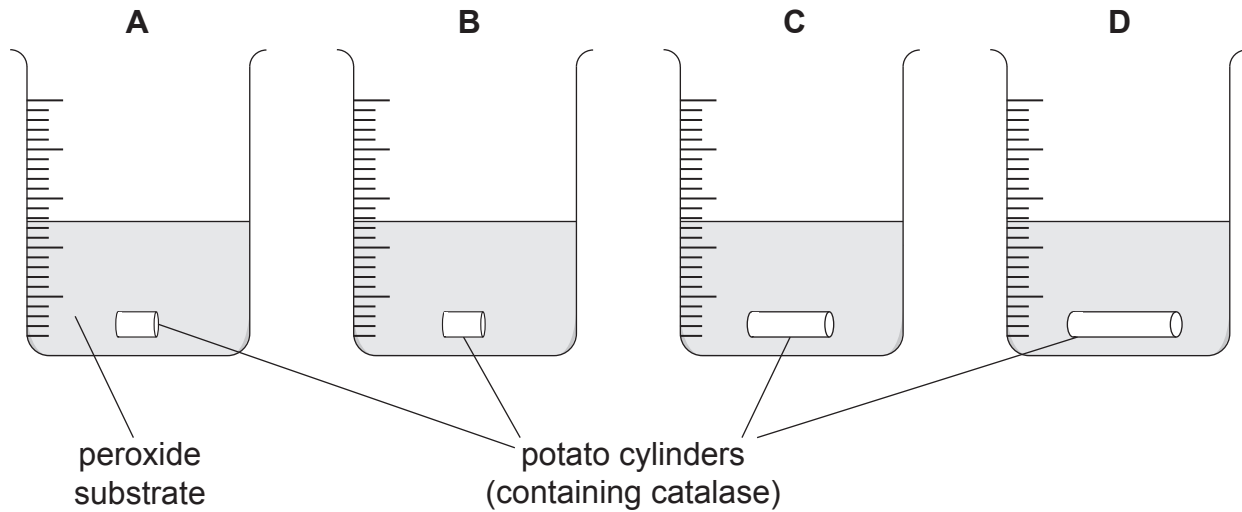
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Potatoes contain the enzyme catalase which joins with the substrate peroxide.

When peroxide is broken down by catalase, gas froth is produced.
A student investigated this reaction.

The diagram shows the set-up of his experiment.
Each beaker contained 50 cm³ of peroxide.



The student carried out the experiment.

- (b) Use the diagram to complete the table by placing a tick (✓) in the correct box for each statement.

Statement	greater	the same	less
the amount of catalase enzyme in the potato cylinder in D compared to B was			
the amount of gas froth produced in B compared to C was			
the rate of reaction in A compared to B was			
the amount of gas froth produced in D when the student repeated the experiment was			

[4]

Catalase joins **only** with the substrate peroxide.

- (c) What term describes this?

[1]

[Turn over



- 5 Three students, **A**, **B** and **C** carried out an investigation into the effect of exercise on their breathing rates.
Each student carried out the same type of exercise for the same length of time.

The table shows some of their results.

Student	Breathing rate at rest / breaths per minute	Breathing rate after exercise / breaths per minute	Time taken for breathing rate to return to rest / minutes
A	17	38	8
B	15	33	5
C	18	41	

(a) Student **C** is the most unfit.

- (i) Using data from the table, explain how you can tell student **C** is the most unfit.

[3]

- (ii) Suggest the time taken for student **C**'s breathing rate to return to rest after exercise.

_____ minutes [1]



- (b) All three students, **A**, **B** and **C**, had an increase in breathing rate during exercise.
Explain why.

[2]

[Turn over

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20GDW1109

6 The Amazon rainforest is home to many plant and animal species.

The statements give information about some feeding relationships in the Amazon rainforest.

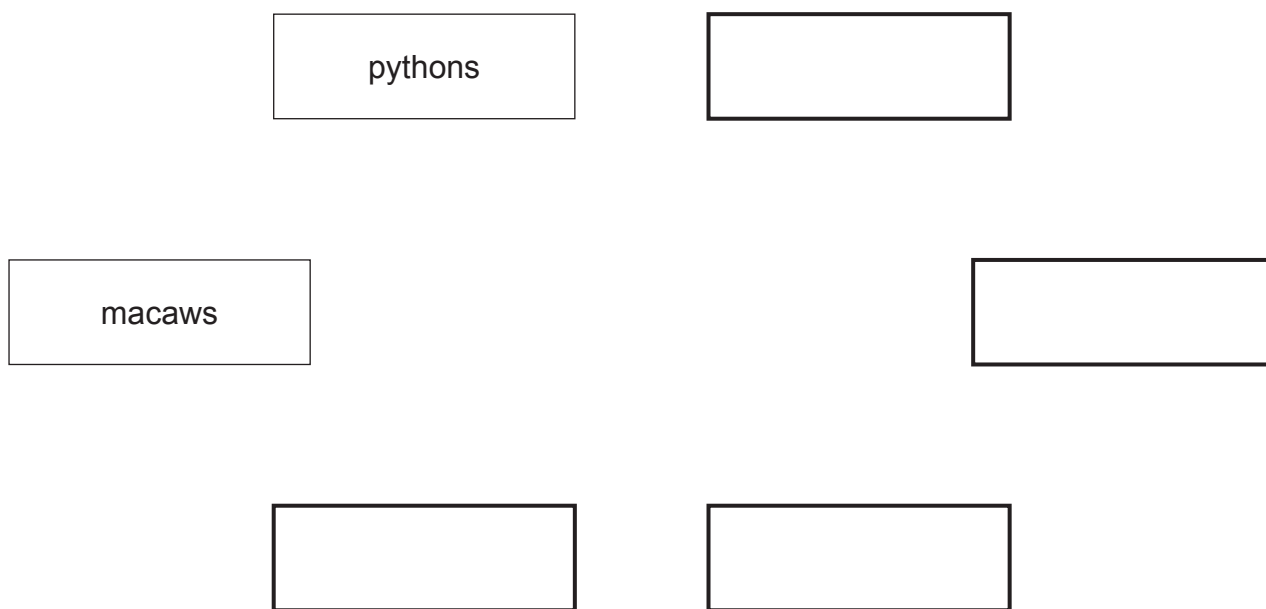
Brazil nut trees and rubber trees carry out photosynthesis.

Macaws and spider monkeys feed on both these trees.

Pythons are predators of macaws.

Jaguars feed on macaws and spider monkeys.

(a) Use the statements to complete the food web.



[4]

(b) (i) What is the original source of energy for this food web?

[1]

(ii) Complete the sentence below.

The organisms that the jaguars feed on are at trophic level _____.

[1]



- (c) Suggest what would happen to the jaguar population if the number of brazil nut trees **and** rubber trees decreased.
Explain your answer.

[3]

- (d) The brazil nut trees and rubber trees **compete** for a variety of abiotic factors.
Give **one** of these abiotic factors.

[1]

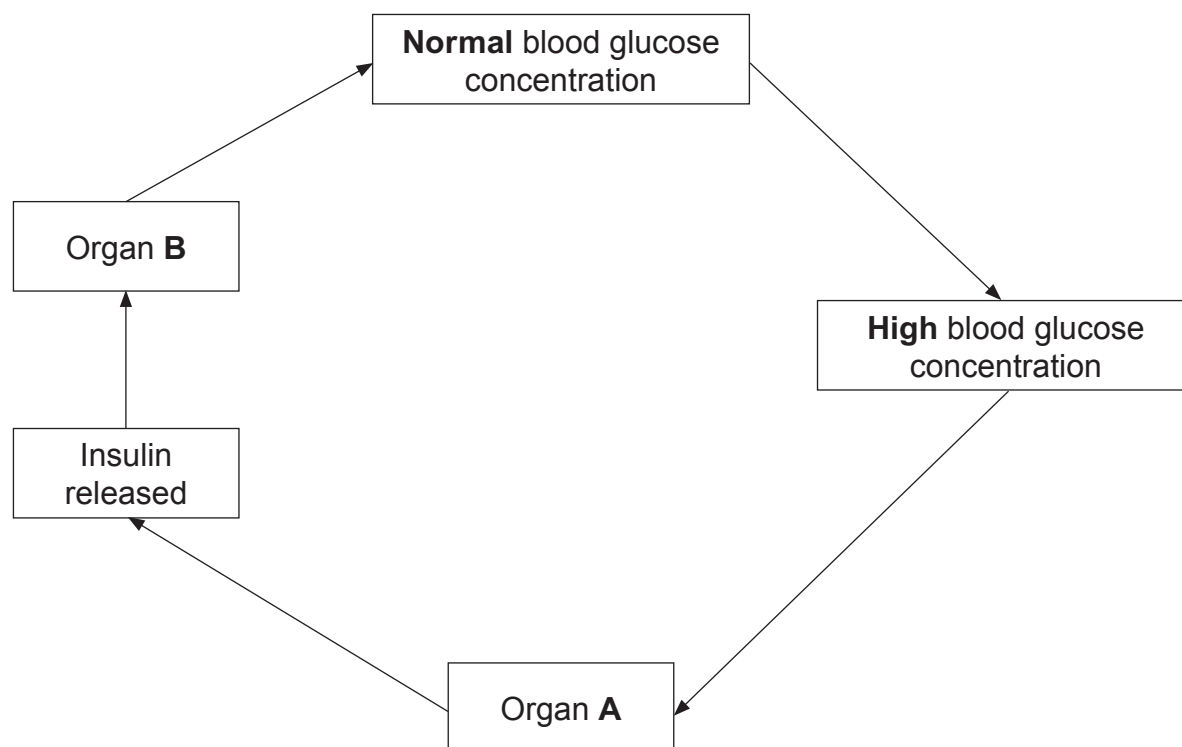
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- 7 (a) The diagram shows part of the mechanism that controls blood glucose concentration.



- (i) Name organ A.

[1]

- (ii) What type of chemical is insulin?

[1]

- (iii) How does insulin travel to organ B?

[1]

- (b) (i) What effect does insulin have on blood glucose concentration?

[1]



(ii) Give **three** ways insulin acts to cause this effect on blood glucose concentration.

1. _____

2. _____

3. _____ [3]

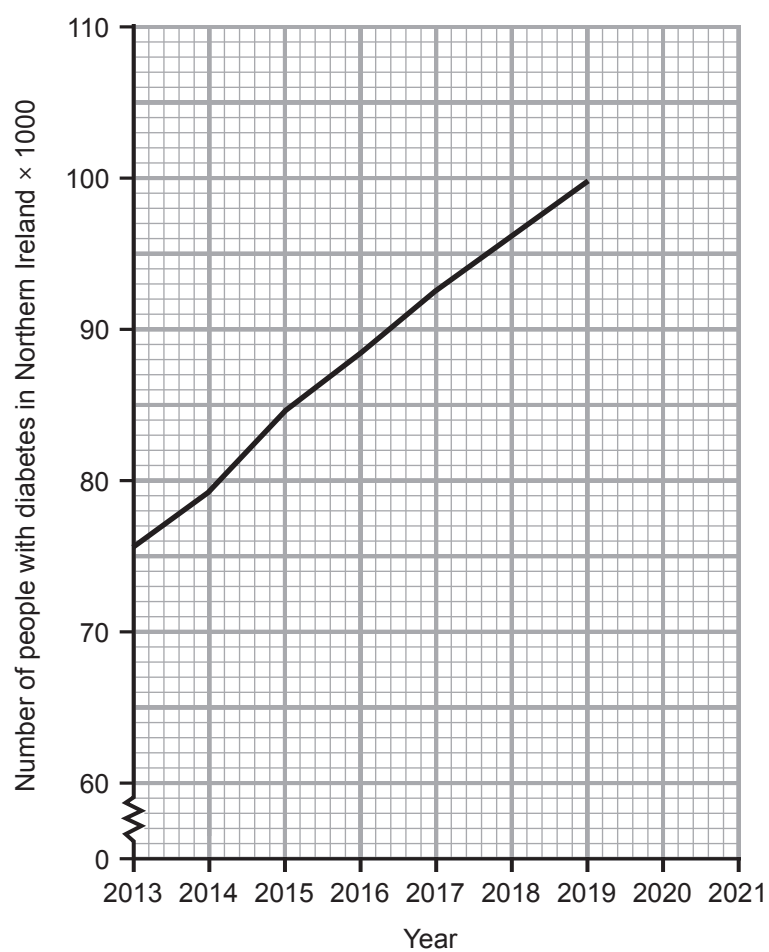
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20GDW1113

- (c) The graph shows the number of people with diabetes in Northern Ireland between 2013 and 2019.



In 2013 there were 75 837 people with diabetes in Northern Ireland.
In 2019 there were 99 833 people with diabetes in Northern Ireland.

- (i) Calculate the percentage (%) increase in the number of people with diabetes in Northern Ireland between 2013 and 2019.

Show your working.

Give your answer to the nearest **whole number**.

_____ % [4]

- (ii) Use a ruler to extend the line on the graph from 2019 to 2021.

Use the line from 2017 to 2019 to help you.

Use the line you have drawn to predict the number of people with diabetes in Northern Ireland in 2021.

_____ thousand [2]

- (d) Suggest a reason for the increase in the number of people with diabetes in Northern Ireland.

_____ [1]

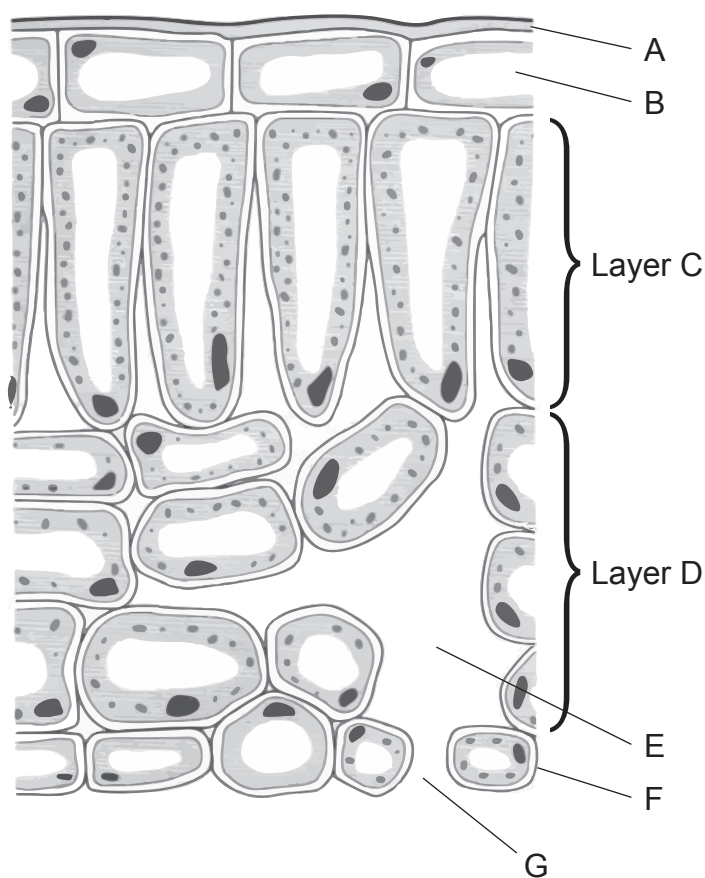
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20GDW1115

8 The diagram shows a cross section of a leaf.



Leaf cells use a gas from the air for photosynthesis.

Name this gas.

Describe how this gas moves from the air outside the leaf to a leaf cell that carries out **maximum photosynthesis**.

You **must** use letters from the diagram in your description.

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



[illegible]

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SOURCES:

Question 4(b) . . . Chief Examiner

Question 7(c) . . . Data from © Diabetes UK (NI)

Question 8 Chief Examiner

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For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	

Total Marks	
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Examiner Number

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