



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

MONDAY 13 NOVEMBER 2023, 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.



1 Some ecological terms and their definitions are given below.

Use a ruler to draw a line between each ecological term and its correct definition.

Ecological term

Definition

habitat

The variety (number) of different types of organisms in an area.

The place where an organism lives.

competition

All the species normally found in a habitat.

biodiversity

The interaction between organisms for the same resource.

ecosystem

The conditions which surround and affect organisms in their habitat.

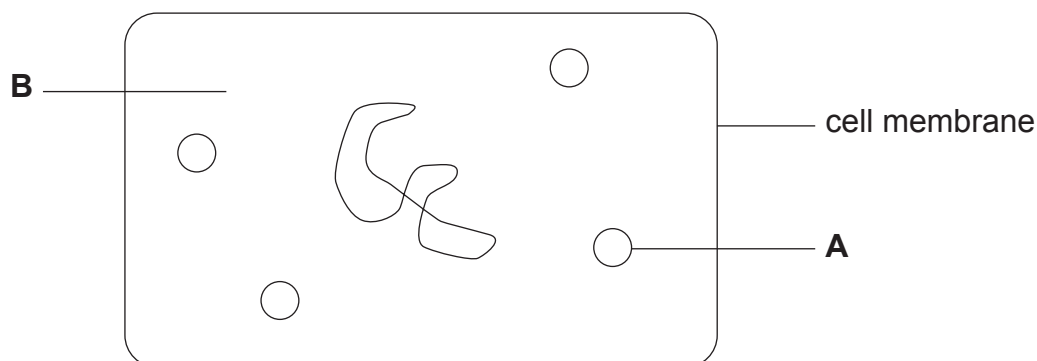
A group of organisms of the same species living in an area.

[4]



2 Bacteria are single-celled organisms.

The diagram shows a **bacterial** cell with a structure missing.



(a) **Draw and label** the structure that is missing from this diagram of a bacterial cell. [2]

(b) Name structure **A**. [1]

(c) Bacterial cells, animal cells and plant cells all contain structure **B**.

(i) Name structure **B**. [1]

(ii) Give the function of structure **B**. [1]

(d) Name **one** structure present in an animal cell that is **not** present in a bacterial cell. [1]

[Turn over



- 3 The kidneys play an important role in removing waste substances from the blood and balancing water levels in the body.

(a) Complete the sentence about the kidneys using words from the list.

digestion

excretory

reproductive

osmoregulation

respiratory

The kidneys are part of the _____ system,
which removes waste substances from the blood and carries out
_____.

[2]

(b) The body loses water through several processes.
One of these processes involves the kidneys.

(i) Name the liquid produced by the kidneys which is made up of water and waste substances.

[1]

(ii) Give **two** other ways the body **loses** water that do **not** involve the kidneys.

1. _____

2. _____

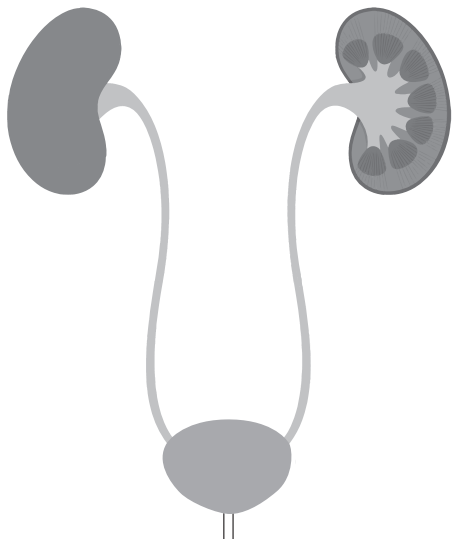
[2]



In this system, some structures occur on their own (singly) and others occur as a pair.

The kidneys occur as a **pair**.

- (c) Use the diagram of this system to complete the table by identifying and naming:
- **one** other structure that occurs as a pair
 - **two** structures that occur singly.



Structures that occur as a pair	Structures that occur singly
kidney	

[3]

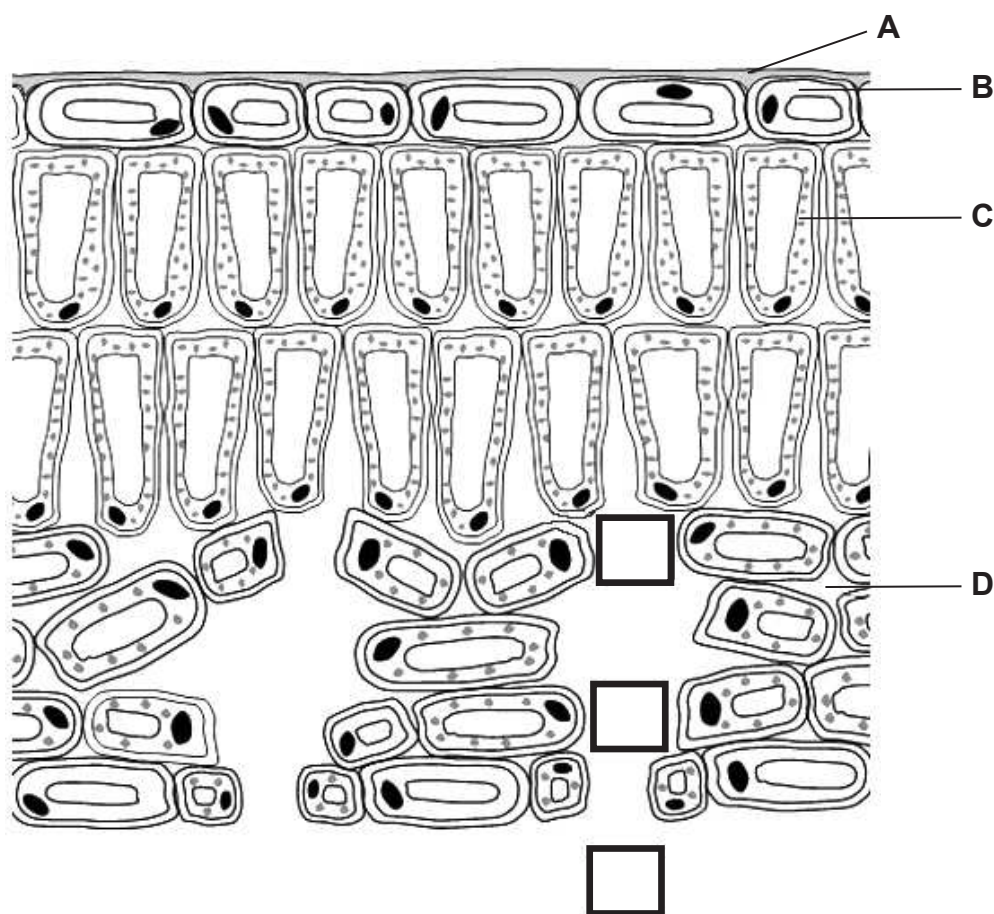
- (d) Suggest **one** advantage of structures occurring as a pair rather than singly, in the body.

[1]

[Turn over



4 The diagram shows a cross section of a leaf.



(a) Name **one** structure present in cell **C** that is **not** present in cell **B**.

[1]

(b) (i) Name layer **A**.

[1]

(ii) Give the function of layer **A**.

[1]



(c) Name part D.

[1]

(d) On the diagram opposite, place an **X** in **one** of the three boxes to show where the concentration of carbon dioxide will be **lowest** during the day.

[1]

[Turn over

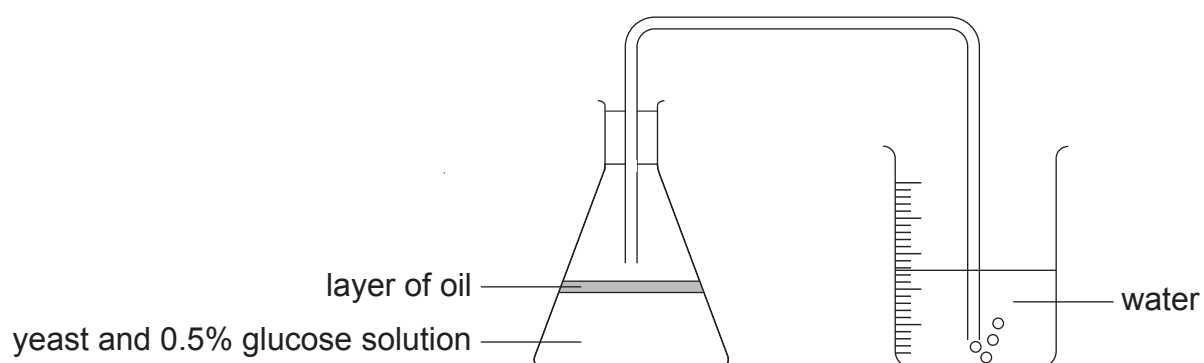
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20GDW1107

5 A student carried out five experiments into respiration in yeast.

The diagram shows the set-up of one of his experiments.



(a) (i) Name the type of respiration carried out by the yeast.

[1]

(ii) Name the gas produced by the yeast.

[1]

(iii) Name the **other** substance produced by the yeast.

[1]



The student used a different concentration of glucose solution in each experiment and counted the number of bubbles of gas produced in one minute.

The table shows his results.

Concentration of glucose solution /%	Number of bubbles of gas produced in one minute
0.5	10
1.0	20
2.0	40
4.0	80
8.0	160

(b) Describe and explain the trend shown by the student's results.

Description _____

Explanation _____

_____ [2]

(c) What, if anything, happened to the temperature in the conical flasks?
Circle the correct answer in the list.

decreased	stayed the same	increased
-----------	-----------------	-----------

[1]

[Turn over



6 Snails are often found on ground-level plants.

The photographs show a snail and a wooden pathway built in an area where snails are common.



A food chain for some organisms living in this area is shown.



(a) What do the arrows represent in this food chain?

_____ [1]

(b) What is the trophic level of snails in this food chain?

_____ [1]



Students carried out two investigations.

The first investigation was to estimate the size of the snail population in this area. This technique involved:

- collecting a 1st sample of snails and marking their shells with coloured nail varnish
- releasing these snails
- collecting a 2nd sample of snails a few days later containing both marked and unmarked snails.

The equation below shows how to calculate an estimate of the population of snails in this area.

$$\text{Estimate of population} = \frac{\text{number of snails in 1st sample} \times \text{total number of snails in 2nd sample}}{\text{number of marked snails in 2nd sample}}$$

- (c) (i) Use the numbers given below and the equation above to calculate an estimate of the population of snails in this area.

The 1st sample contained 106 snails.

The total number of snails in the 2nd sample (both marked and unmarked) was 115 snails.

The 2nd sample contained 69 **unmarked** snails.

Show your working.

_____ [3]

[Turn over



- (ii) Suggest **one** reason why the coloured nail varnish used to mark the shells should **not** be on the **top** of the shells.

[1]

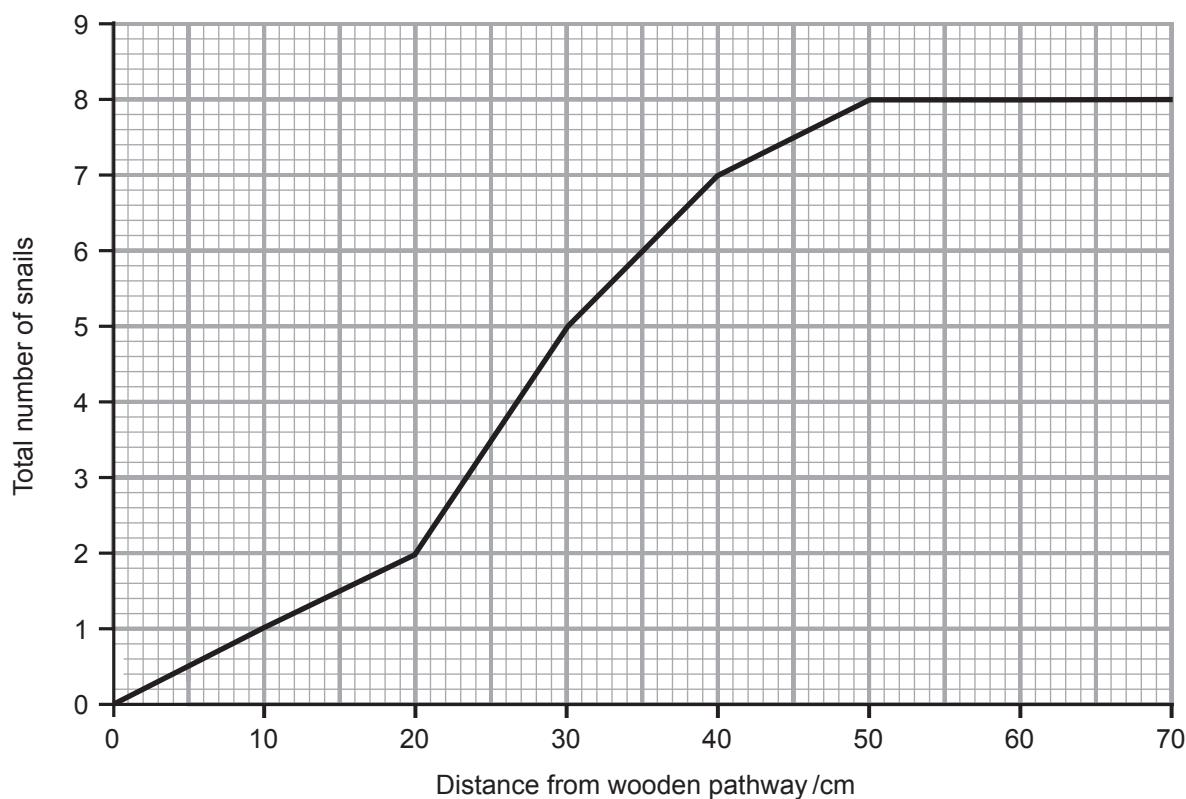
The students carried out a second investigation.

They counted the total number of snails present at different distances from each side of the wooden pathway.

The wooden pathway was built to try to stop people walking on the ground-level plants.

Most people walk on or close to the wooden pathway.

The graph shows the students' results.



(d) Describe the trends shown in the graph between distances of:

- 0–50 cm from the wooden pathway
- 50–70 cm from the wooden pathway.

0–50 cm

50–70 cm

Suggest **two** explanations for the trend between **0–50 cm** from the wooden pathway.

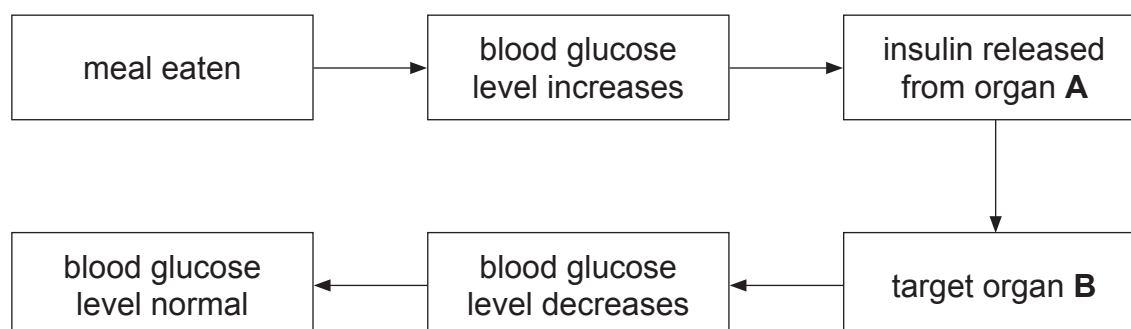
[4]

[Turn over



7 The body must maintain a constant blood glucose level to function correctly.

(a) The diagram shows how insulin changes a person's blood glucose level after eating a meal high in complex carbohydrates.



(i) Explain why eating a meal high in complex carbohydrates causes the blood glucose level to increase.

[2]

(ii) Name organ A.

[1]



A different hormone is released when a person's blood glucose level decreases below normal.

This hormone acts in the **opposite way** to insulin.

(b) Suggest **two** ways that **this** hormone acts to return a person's blood glucose level to normal.

1. _____

2. _____

_____ [2]

Diabetes is a condition in which the blood glucose control mechanism fails. There are two types of diabetes, Type 1 and Type 2.

The table gives statements about both types.

(c) Write a tick (✓) in the box to identify the correct answer for each statement.

Statement	Only true for Type 1 diabetes	Only true for Type 2 diabetes	True for both Type 1 and Type 2 diabetes
Thirst is a symptom			
Always treated with insulin			
Usually occurs later in life			
Heart disease is a long-term complication			
Linked to obesity			

[5]

[Turn over

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The table shows the number of people with diabetes in Northern Ireland between 2016 and 2019.

Year	Number of people with diabetes in Northern Ireland
2016	88 305
2017	92 480
2018	96 114
2019	99 833

- (d) Use the data in the table to calculate the percentage (%) increase in the number of people with diabetes in Northern Ireland between 2016 and 2019.

Show your working.

Give your answer to **one** decimal place.

_____ % [4]

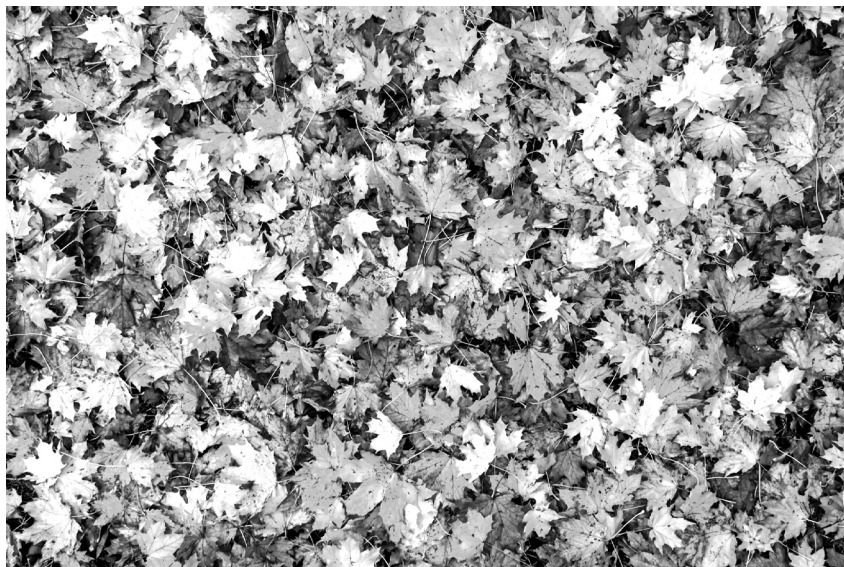


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- 8 The photograph shows leaf litter.
Leaf litter is dead plant material that has fallen to the ground.



Leaf litter is decomposed after it falls to the ground.

Describe the process of decomposition.

Name **one** abiotic factor that affects the rate of decomposition. Explain how this factor affects the rate of decomposition.

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

Description of the process of decomposition





Abiotic factor and how it affects the rate of decomposition

[6]

THIS IS THE END OF THE QUESTION PAPER



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