



General Certificate of Secondary Education
2024–2025

Centre Number

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Candidate Number

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Double Award Science: Biology

Unit B1
Foundation Tier



[GDW11]

GDW11

MONDAY 11 NOVEMBER 2024, AFTERNOON

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 questions in black ink and use a dark HB pencil for drawings and graphs.

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.

You may use a scientific calculator.

Quality of written communication will be assessed in Question 7.

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- 1 Puffins and other seabirds live on sea cliffs.
The photograph shows puffins on a sea cliff.



Use a ruler to draw a line from each statement to the correct ecological term.

Statement

Ecological term

sea cliff

biodiversity

puffins

ecosystem

the **number of different** species
living on a sea cliff

abiotic

population

habitat

[3]



2 (a) Animals have two communication systems. One of these is the nervous system.

(i) Name the **two** parts of the central nervous system.

_____ and _____ [2]

(ii) Complete the sentence about the role of the central nervous system.

The role of the central nervous system is to co-ordinate

and _____ responses between

receptors and _____ . [2]

(b) Plants respond to their environment by a process called phototropism.

(i) What is phototropism?

_____ [1]

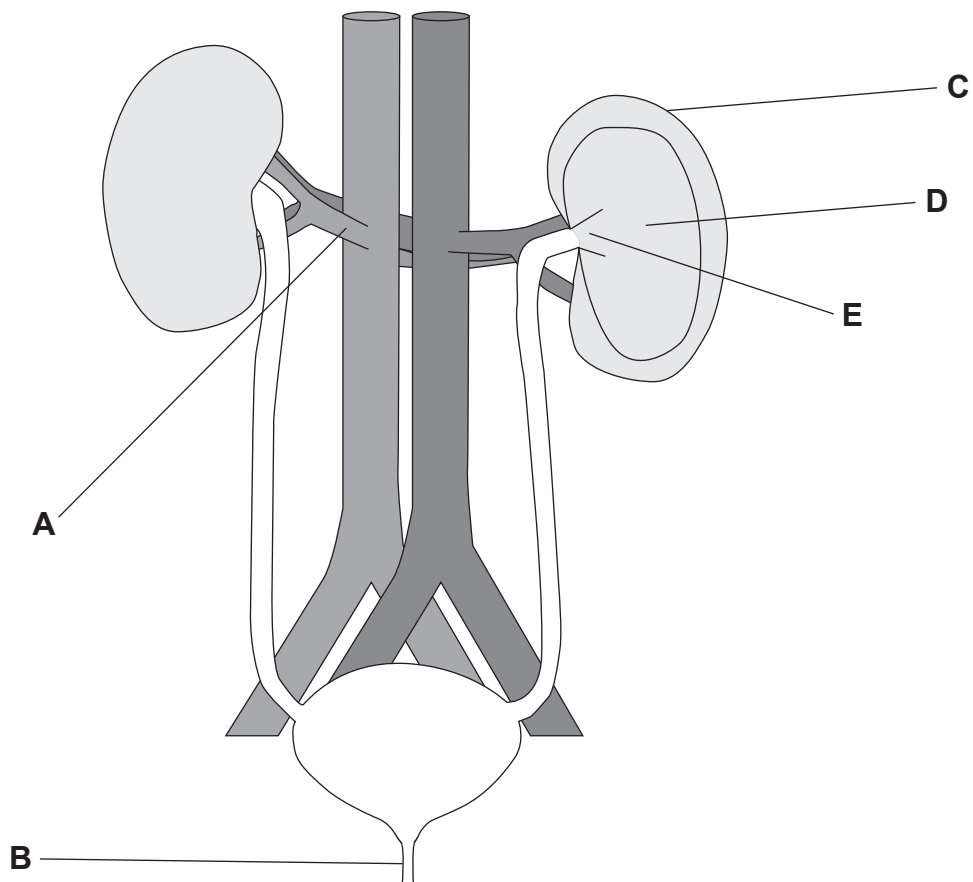
(ii) Phototropism is controlled by a chemical called auxin.
What type of chemical is auxin?

_____ [1]

[Turn over



3 The diagram shows part of the excretory system.



(a) Name blood vessel **A** that carries blood **out** of the kidney.

[1]

(b) Name structure **B**.

[1]



(c) (i) Complete the following sentences about the excretory system.

Choose your answers from the list.

medulla	food	ureter
blood	water	cortex

The kidneys control the reabsorption of _____.

The middle region of a kidney is called the _____.

[2]

(ii) Which letter on the diagram shows the location of the pelvis?

[1]



4 Carbon is an essential element in every living organism.

(a) Name the **two** types of microorganism that produce humus after an organism has died.

_____ and _____ [2]

Some of the processes in the carbon cycle are given in the list.

decomposition	photosynthesis	feeding
combustion	respiration	fossilisation

(b) Descriptions of some of the processes in the carbon cycle are given in the table below.

Choose the process, from the list above, that matches each description.

Write your answers in the empty boxes.

Description	Process
sunlight is absorbed to produce glucose	
animals eat plants	
microorganisms produce humus after an organism has died	
plants and animals release carbon dioxide	

[4]



- (c) (i) Name the structures present in some leaf cells that absorb sunlight to produce glucose.

[1]

- (ii) Name **one** type of **leaf cell** that does **not** have the structures that absorb sunlight to produce glucose.

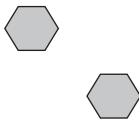
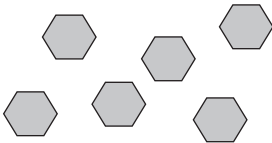
[1]

[Turn over]



- 5 The diagram represents the blood glucose concentrations of an individual before and after eating a meal rich in carbohydrate.

After eating the meal, the individual produced insulin that travelled to the liver. This resulted in the blood glucose concentration 90 minutes after eating the meal as shown in the diagram.

Blood glucose concentration before eating	Blood glucose concentration 30 minutes after eating	Blood glucose concentration 90 minutes after eating
		

Key



glucose molecule

- (a) Explain how insulin caused the **decrease** in blood glucose concentration between 30 minutes and 90 minutes after eating.

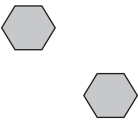
[2]



(b) A second individual has diabetes and **cannot** produce insulin.

- (i) Complete the diagram below to show the blood glucose concentrations you would expect in this individual 30 minutes and 90 minutes **after** eating a meal rich in carbohydrate.

Draw the glucose molecules in the two empty boxes.

Blood glucose concentration before eating	Blood glucose concentration 30 minutes after eating	Blood glucose concentration 90 minutes after eating
		

Key



glucose molecule

[2]

- (ii) Give **two** symptoms of diabetes.

1. _____

2. _____ [2]

- (iii) Give **two** long-term effects of diabetes.

1. _____

2. _____ [2]

[Turn over



- 6 Leopards are found in Africa.
The photograph shows a leopard.

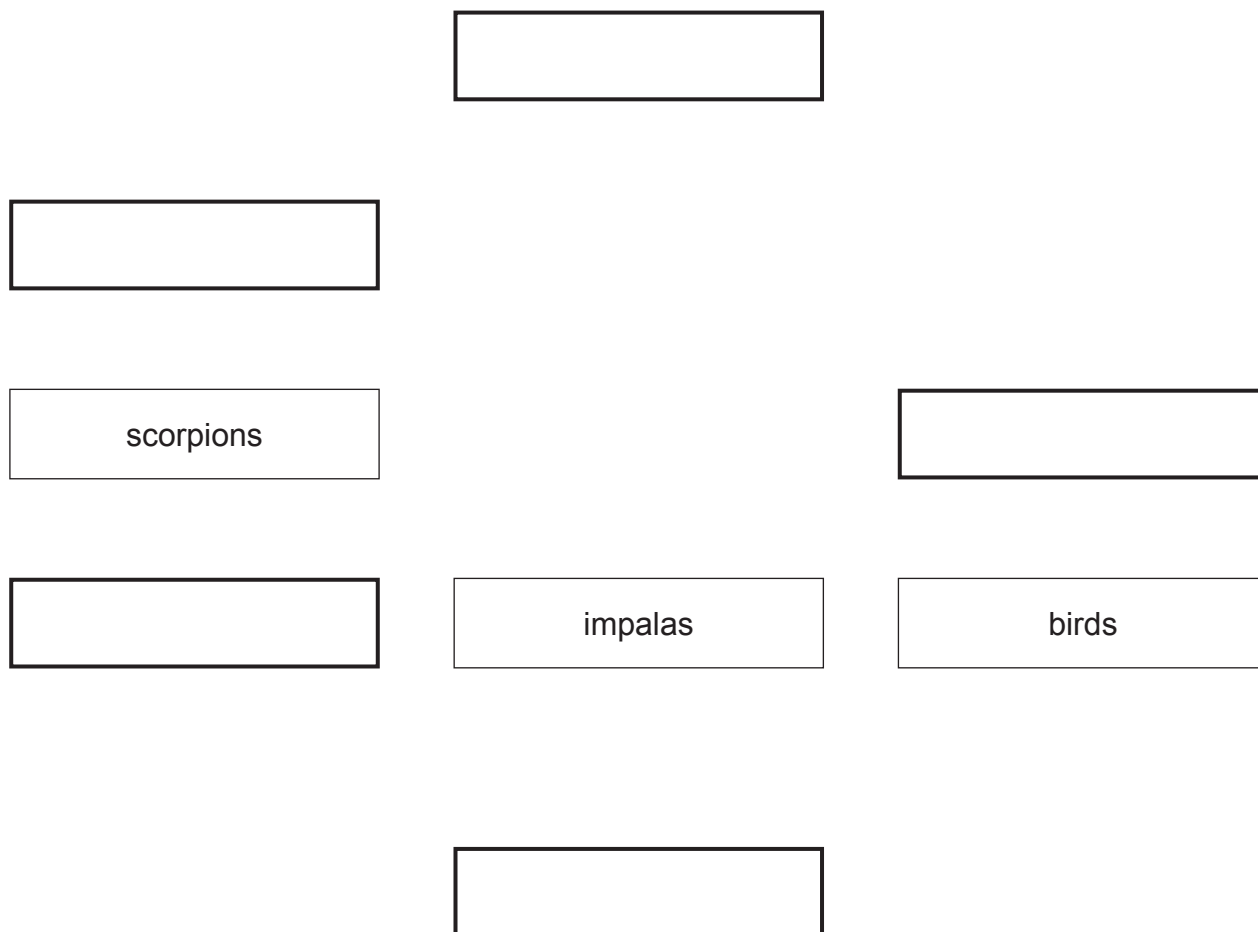


The statements below give information about a food web that includes leopards.

Grass is the producer.
Locusts, impalas and birds are primary consumers.
Scorpions feed on locusts.
Hawks are secondary consumers that feed on birds.
Baboons feed on scorpions.
Leopards feed on impalas and baboons.



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



[4]

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

[1]

(ii) Name the animal that feeds at **two** trophic levels in this food web.

[1]

[Turn over



(iii) Use the food web to **explain** why the number of **impalas** would decrease if the number of scorpions decreased.

Circle the correct answer in each list to explain why the number of impalas would decrease.

The baboons have

more
food

less
food

the same
amount of food

This means that the
leopards feed on

more
baboons

fewer
baboons

the same
number of baboons

This means that the
leopards feed on

more
impalas

fewer
impalas

the same
number of impalas

[3]

Some types of leopards are endangered.

Conservation efforts have increased the population of one type of leopard in the wild from **30** in 1970 to **84** in 2023.

(c) Calculate the percentage (%) increase in the population of this type of leopard in the wild between 1970 and 2023.

Show your working out.

_____ % [3]



- 7 Give the structure and function of the large biological molecules, **cellulose**, **starch** and **fat**.

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

Cellulose

Structure _____

Function _____

Starch

Structure _____

Function _____

Fat

Structure _____

Function _____

[6]

[Turn over



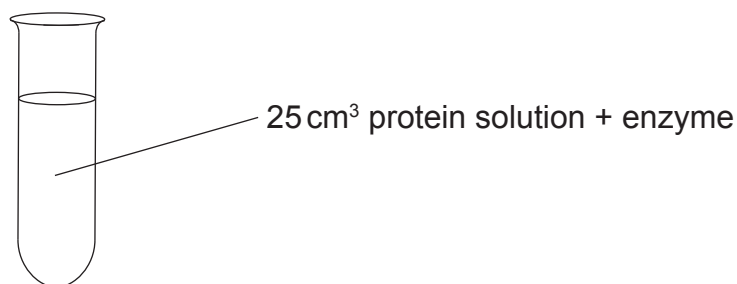
8 Enzymes are biological catalysts that speed up the rate of reactions.

(a) Name the **model** used to illustrate the action of enzymes.

[1]

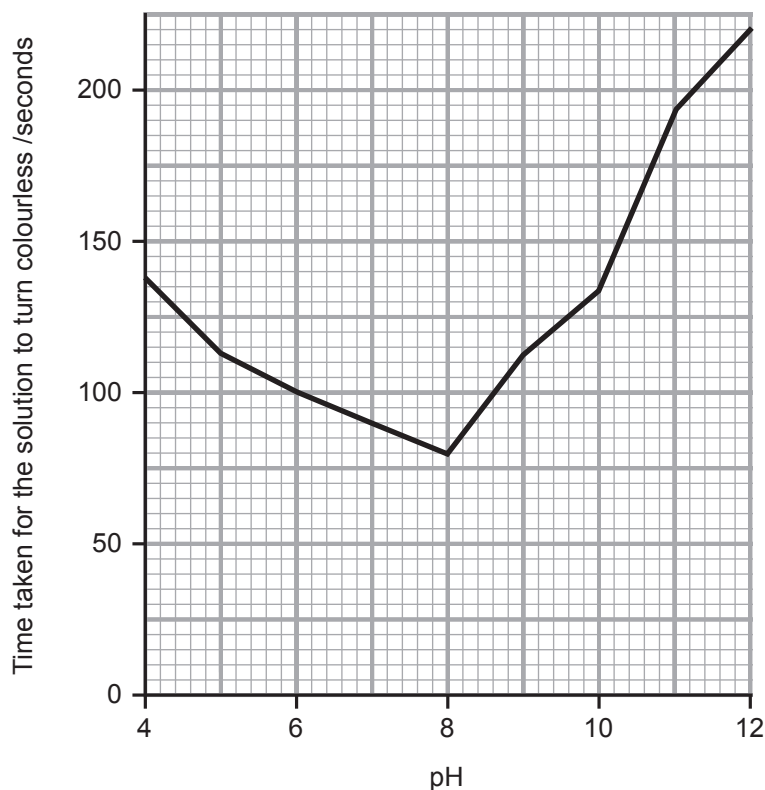
(b) When the protein in a solution is broken down by a particular enzyme, the solution changes from white to colourless.

A student investigated the effect of pH on the activity of this enzyme.
The diagram shows one of the test tubes the student used.



The temperature was maintained at **30 °C** throughout the experiment.

The graph shows the time taken for the solution to turn colourless at each pH value.



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- (i) Name the type of enzyme that breaks down protein.

[1]

- (ii) Use the graph to give the optimum pH for **this** enzyme.
Explain your answer.

pH _____

Explanation _____

[2]

- (iii) Use the graph to complete the table to state if the solution was white or colourless at each pH value and time.

Write your answers in the empty boxes.

pH	Time /seconds	White or colourless
4	100	
10	150	

[1]

[Turn over



- (c) The student repeated the investigation but **increased** the temperature from 30 °C to 37 °C.

Circle the correct answer in each list below to complete the statements.

- (i) The time taken for the solution to turn colourless at **pH 8** is most likely to have been

50 seconds

80 seconds

120 seconds

[1]

- (ii) The movement of the molecules in the solution would have

decreased

stayed the same

increased

[1]

- (iii) The number of collisions of the molecules in the solution would have

decreased

stayed the same

increased

[1]



- (d) A second student carried out the experiment using the same protein solution with a **different** enzyme.

Describe and fully explain the result the student would have obtained.

Description _____

Explanation _____

[4]

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Examiner Number

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