



Rewarding Learning

General Certificate of Secondary Education
2025

Centre Number

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Candidate Number

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Double Award Science: Biology

Unit 7 Practical Skills
Booklet B
Higher Tier



[GDW76]

GDW76

MONDAY 9 JUNE, MORNING

TIME

30 minutes.

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 three** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 35.

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 **1(b)**.

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- 1 (a) A group of students investigated the number of different plant species present at five locations from the edge of a woodland to a grassy area.

They also measured various factors at each location.

The five locations, **A**, **B**, **C**, **D** and **E**, are shown in the diagram.



The students measured the temperature, soil water content and soil pH at each location.

- (i) What type of factors are temperature, soil water content and soil pH?

_____ [1]

- (ii) Give **one other** factor that the students could have measured.

_____ [1]

- (iii) What would the students have used to measure temperature?

_____ [1]



- (b)** Describe the method the students would have used to carry out the investigation to find the **number of different plant species** present at five locations, from the edge of the woodland to the grassy area.

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

[illegible]

[6]

[Turn over

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(c) The table shows some of the students' results.

(i) Complete the last two columns of the table for location **B** by writing in the empty boxes.

Location	Names of plant species present	Tally of different plant species present	Number of different plant species present
A	grass plantain clover moss dandelion buttercup bluebell		7
B	grass plantain clover moss dandelion daisy		
C	grass plantain clover moss daisy		5
D	grass plantain clover daisy		4
E	grass plantain daisy		3

[2]



Use the table to answer the following questions.

- (ii) Name the plant species found at locations **A**, **B**, **C** and **D**, but not at location **E**.

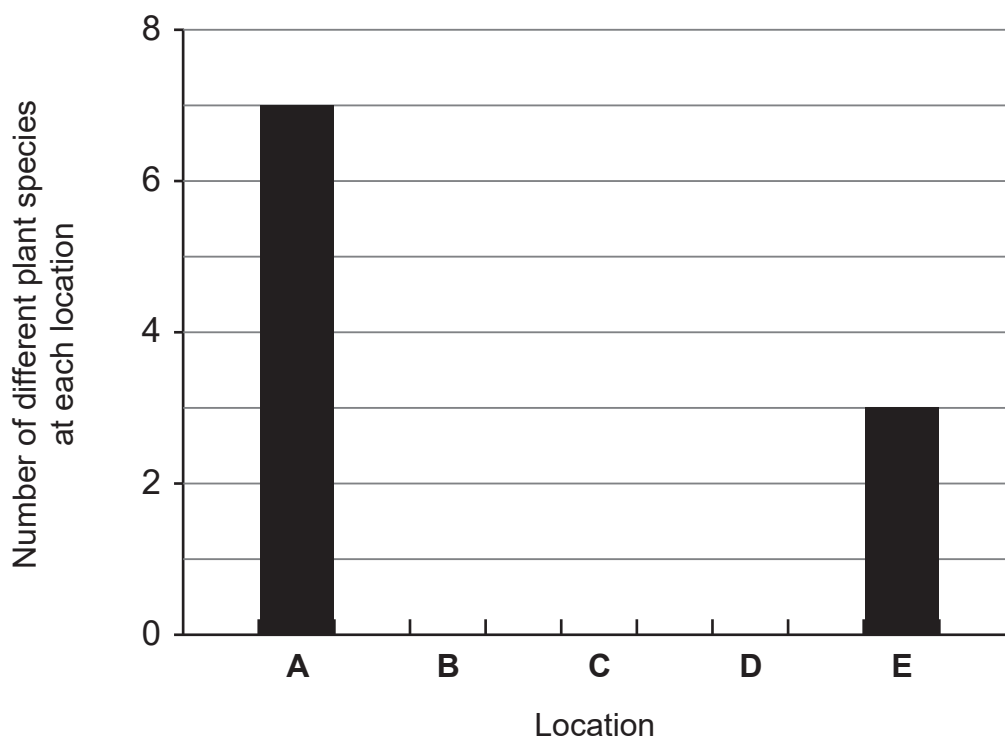
[1]

Bluebell is one plant species found **only** at the edge of the woodland.

- (iii) Name the **other** plant species that is found only at the edge of the woodland.

[1]

- (d) The students drew a bar chart of the number of different plant species at locations **A** and **E**.



- (i) Draw the bars for the number of different plant species at locations **B**, **C** and **D**.

Shade the bars you have drawn.

[2]

[Turn over]



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- (ii) Describe the trend for the number of different plant species from location **A** to location **E**.

[1]

The table shows the results of the factors that the students measured.

Location	Soil pH	Soil water content	Temperature /°C
A	6.6	moist	13
B	6.7	dry	14
C	6.6	dry	15
D	6.6	very dry	17
E	6.6	very dry	17

- (e) Use all the information given to identify the **two** conditions that result in the **least** number of different plant species.

Circle the **two** conditions in the list below.

moist	15 °C	17 °C
pH 6.7	13 °C	very dry

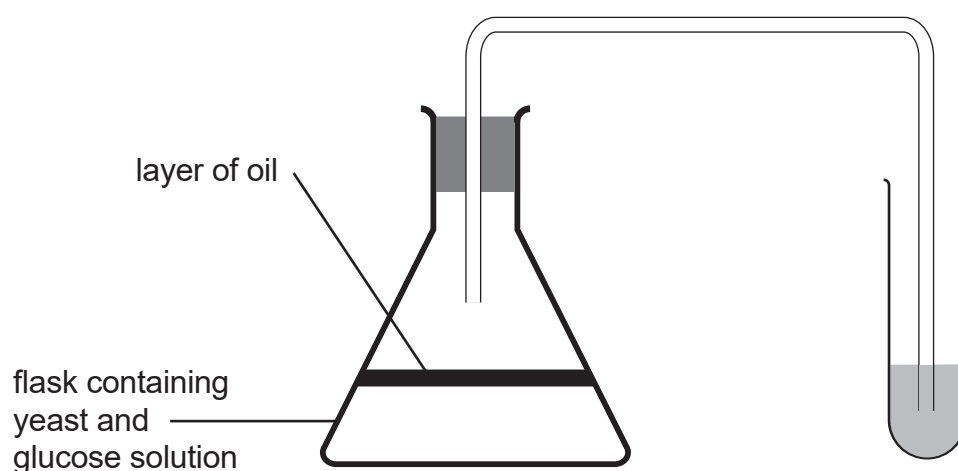
[2]

[Turn over]



- 2 A student carried out an investigation into anaerobic respiration in yeast.

The diagram shows the set-up of his investigation.



The table shows some of the student's results.

Time/minutes	Concentration of glucose solution /arbitrary units	Appearance of yeast and glucose solution in flask
0	50	clear
5	48	slightly cloudy
10	44	cloudy
15	36	very cloudy
20		very cloudy



The student boiled the glucose solution and let it cool before he added the yeast.

- (a) (i) Explain why it was important that the glucose solution was cool before the yeast was added.

_____ [1]

- (ii) Give the function of the layer of oil.

_____ [1]

The table shows the concentration of the glucose solution for the first 15 minutes.

- (b) Use the **trend** shown in the table to calculate the concentration of the glucose solution at 20 minutes.

Show your working out.

_____ arbitrary units [2]

The concentration of the glucose solution decreased and the solution became more cloudy during the student's investigation.

- (c) Give **two other** changes that occurred in the **flask** during the student's investigation.

1. _____
2. _____ [2]

[Turn over]



3 Bacteria can be grown safely in a laboratory in Petri dishes.

- (a) (i) Name the apparatus used to sterilise an inoculating loop.

[1]

- (ii) Give the maximum temperature that should be used to incubate bacteria safely in a laboratory.

_____ °C

[1]

Antibiotics are chemicals that are used to treat bacterial diseases.

- (b) Name **one** antibiotic.

[1]

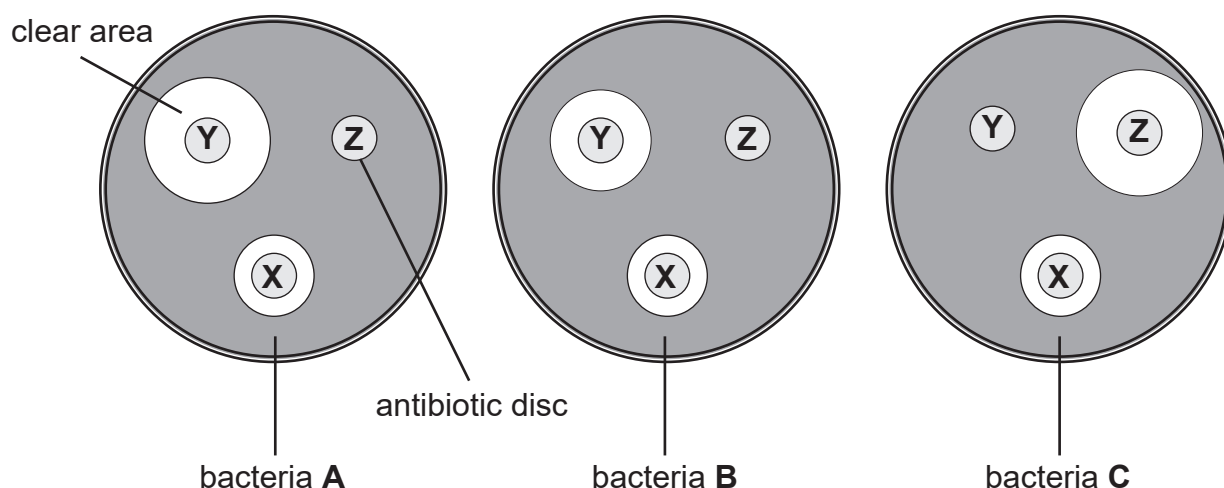
- (c) Scientists carried out an investigation to find out the effectiveness of three different antibiotics against three different types of bacteria, **A**, **B** and **C**.

Each type of bacteria was grown on agar in a different Petri dish.

The antibiotics used were **X**, **Y** and **Z**.

Discs with the same concentration of each antibiotic were placed on the agar.

The diagram shows the results after the Petri dishes were incubated for two days.



- (i) Which antibiotic had an effect on the growth of **all** three types of bacteria?

[1]

- (ii) Which antibiotic was most effective against bacteria **A**?

Explain your answer.

Antibiotic _____

Explanation _____

[3]

- (iii) Antibiotic **Z** is **not** effective against which bacteria?

[1]

- (iv) None of the bacteria grown were MRSA.

Give evidence from the results of this investigation to support this statement.

[1]

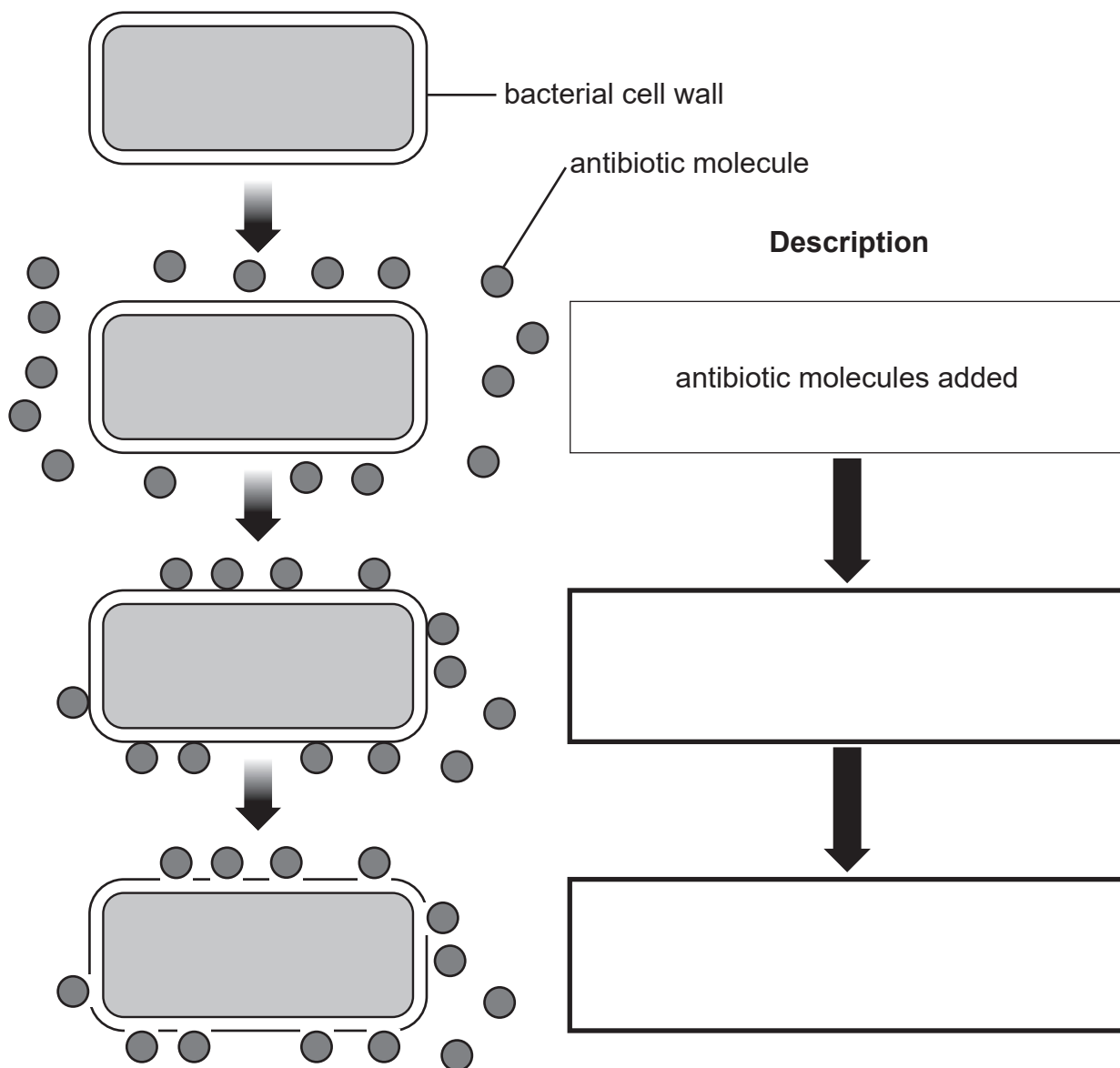
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The diagram below shows how an antibiotic affects one type of bacterium.

(d) Use **only** the diagram to describe how this antibiotic affects the bacterial cell.

Write your descriptions in the empty boxes.



[2]





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SOURCES

Question 1(a): Adapted from Thinkstock

Question 2: Chief Examiner

Question 3(c)–(d): Chief Examiner

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Question Number	Marks
1	
2	
3	

Total Marks	
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Examiner Number

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