



Rewarding Learning

General Certificate of Secondary Education
2023

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

FRIDAY 9 JUNE, AFTERNOON

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

Answer **all** 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.

Quality of written communication will be assessed in Question **2**.

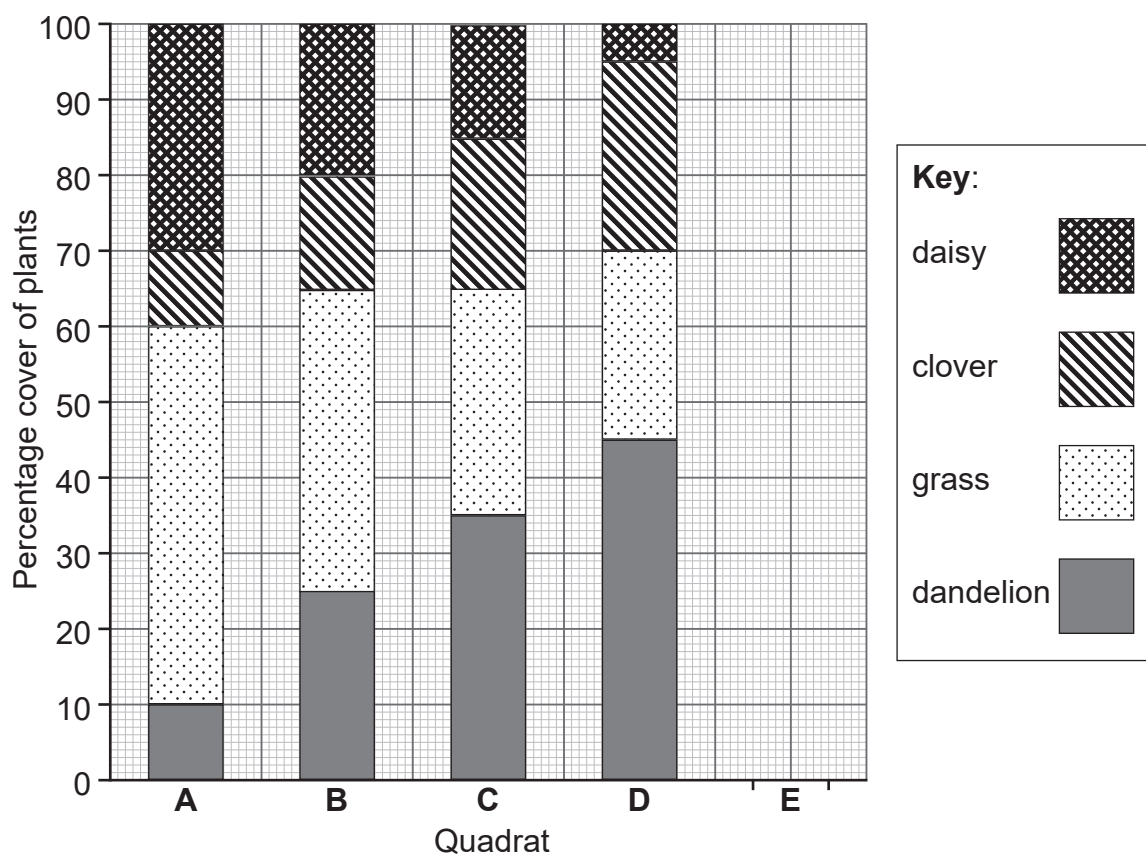


- 1 (a) A group of students investigated the percentage cover of four different types of plant, daisy, clover, grass and dandelion, along a line transect.

The students recorded the percentage cover of each type of plant present in five quadrats, **A**, **B**, **C**, **D** and **E**, at the positions shown in the diagram.



Some of the results of their investigation are shown in the bar chart.



- (i) In which quadrat was the percentage cover of grass plants highest?

Circle the correct answer from the list.

A **B** **C** **D**

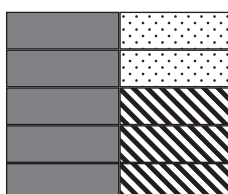
[1]



- (ii) Give the trend in the percentage cover of daisy plants from quadrats **A** to **D**.

_____ [1]

- (b) The percentage cover of plants present in quadrat **E** is represented in the diagram below.



- (i) Use the diagram above to complete the table for the percentage cover of the different types of plants present in quadrat **E**.

The percentage cover of clover plants has been completed for you.

Type of plant	Percentage cover of plants
daisy	
clover	30
grass	
dandelion	

[2]

- (ii) Use your answers in the table above to add a bar for quadrat **E** to the bar chart opposite. Use the **key** to correctly shade the bar you have drawn. [3]

- (c) The percentage cover of dandelion plants increased between quadrats **A** and **D**.

- (i) Use the bar chart to calculate the increase in percentage cover of dandelion plants between quadrats **A** and **D**.

Show your working.

_____ [2]

[Turn over]



The students also measured three abiotic factors at each quadrat.

The table shows their results.

Quadrat	Light levels	Soil pH	Temperature/°C
A	very high	6.7	17
B	very high	6.8	14
C	medium	6.7	13
D	low	6.7	11
E	low	6.7	10

(ii) Use the results in the table to suggest **two** reasons for the increase in percentage cover of the dandelion plants between quadrats **A** and **D**.

1. _____

2. _____

_____ [2]

(iii) Name **one other** abiotic factor that plants compete for.

[1]



[illegible]

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

[illegible]

[6]

[Turn over

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3 (a) Aseptic techniques are used when culturing bacteria.

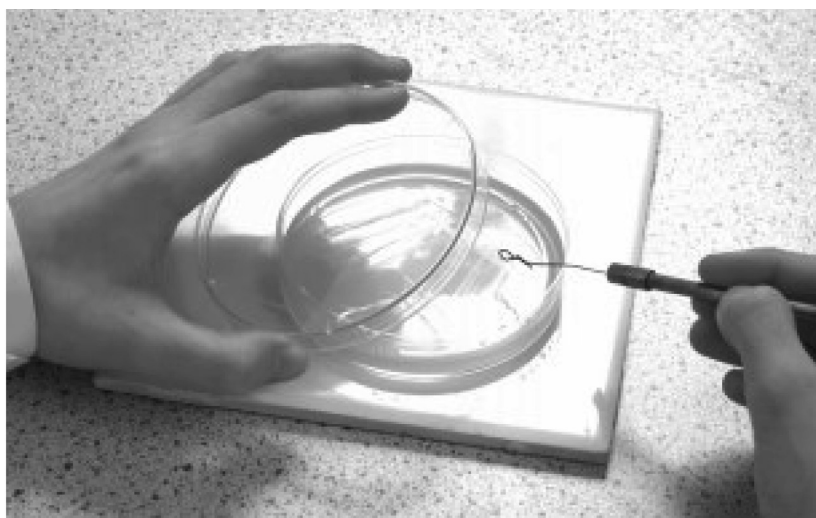
An autoclave is used to sterilise apparatus and materials.

Give **two** pieces of apparatus, used in aseptic techniques, that could be sterilised in an autoclave.

1. _____

2. _____ [2]

(b) The photograph shows the inoculation of an agar plate with one type of bacteria.



(i) Explain why the lid of the Petri dish is only **partially** opened when inoculating the agar with bacteria.

_____ [1]

(ii) After inoculation the agar plate is incubated at a **maximum** of 25°C. Explain why.

_____ [1]

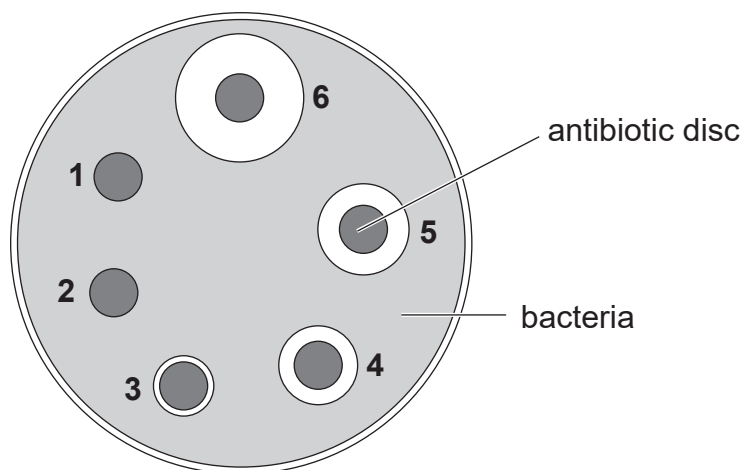


(c) A scientist prepared an agar plate and grew one type of bacteria on it.

He added six discs on to the agar plate. Each disc, 1–6, contained a **different concentration** of an antibiotic.

He then incubated the agar plate for two days.

The diagram shows his results.



(i) Describe the results for antibiotic discs **1** and **2**.

[1]

(ii) Give the number of the antibiotic disc with the **minimum** concentration of antibiotic that would be effective against this type of bacteria.

Explain your answer.

Number _____

[3]

[Turn over]



(iii) Suggest why experiments are carried out to find the **minimum** effective concentration of an antibiotic needed to treat a bacterial disease.

[1]





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(Questions continue overleaf)

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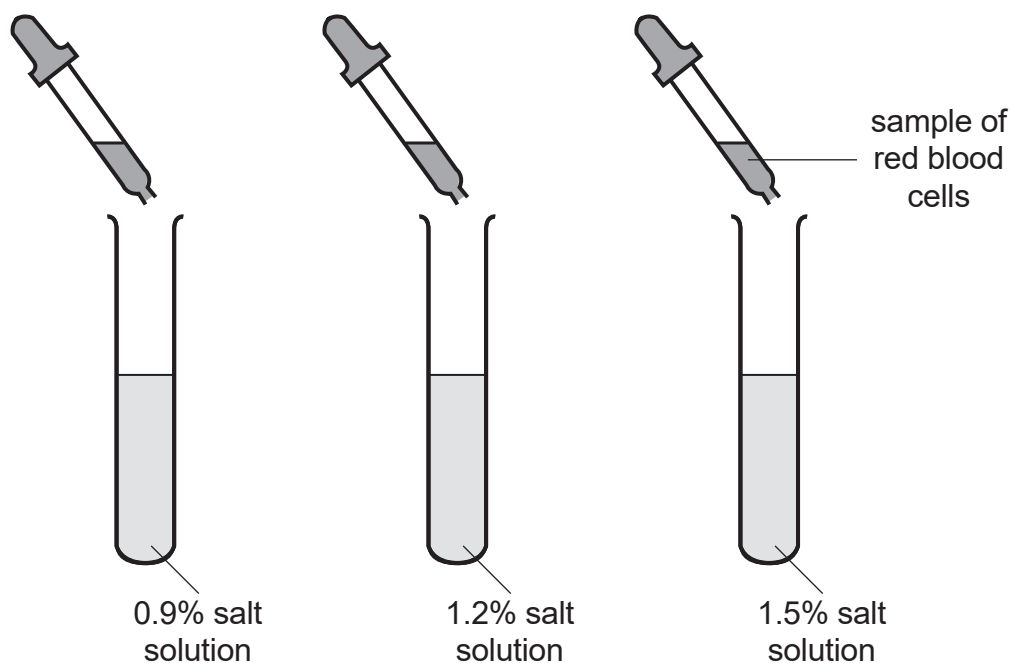
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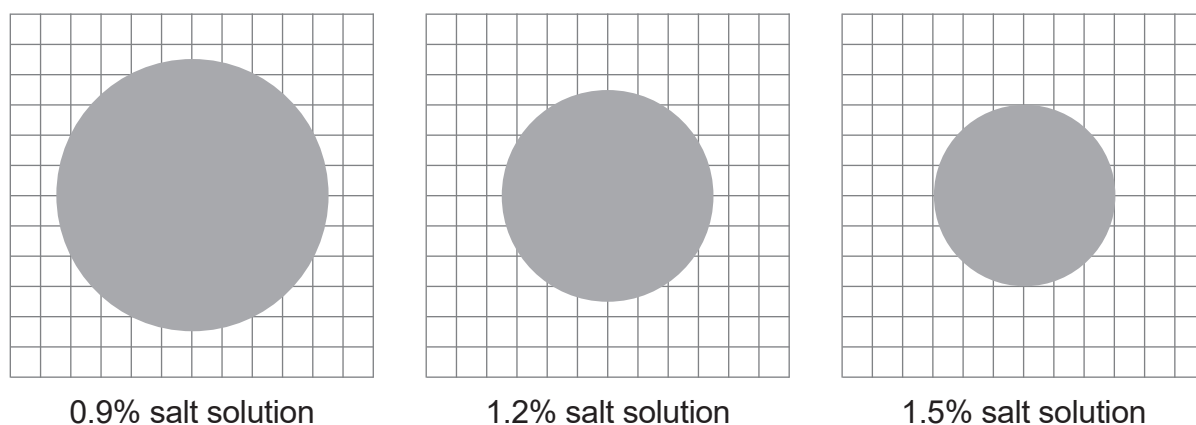
- 4 (a) A scientist investigated the best concentration of salt solution to store samples of red blood cells.

The diagram shows the set-up of her investigation.



The scientist used a microscope to view the red blood cells after they had been stored in the salt solutions for 30 minutes.

The diagrams show her results.



The scientist used the grid to measure the diameter of the red blood cells stored in the 0.9% and 1.5% salt solutions.

- (i) Use the grid to measure the diameter of the red blood cell in the 1.2% salt solution.

Write your answer in the table.

Use the information in the table to calculate the diameter of this red blood cell in micrometres.

Write your answer in the table.

Concentration of salt solution / %	Diameter / squares	Diameter of red blood cell / micrometres
0.9	9	4.5
1.2		
1.5	6	3.0

[2]

Normally, red blood cells have a diameter of between 4.0 and 5.0 micrometres.

- (ii) Give the best concentration of salt solution for storing red blood cells.

_____ % salt solution [1]

[Turn over



(iii) Use your knowledge of osmosis to explain why the concentration of salt solution in (ii) is the best concentration for storing red blood cells.

[3]

(b) Another scientist used water (0% salt solution) to store potato cells.

Explain why the potato cells will **not** burst in water.

[2]

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Q4.....Principal Examiner

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Question Number	Marks
1	
2	
3	
4	

Total Marks	
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Examiner Number

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