



Rewarding Learning

General Certificate of Secondary Education
2024

Centre Number

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Candidate Number

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Biology

Unit 3 Practical Skills

Booklet B

Foundation Tier



[GBL32]

GBL32

THURSDAY 20 JUNE, 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 **70**.

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 **5(a)**.



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28GBL3202

- 1 (a) The table gives some information about three food tests.

Complete the table.

Type of food sample	Reagent	Colour of reagent before the food test	Colour of reagent after the food test
	iodine solution	yellow-brown	
sugar	Benedict's		brick red precipitate
	ethanol	colourless	

[5]

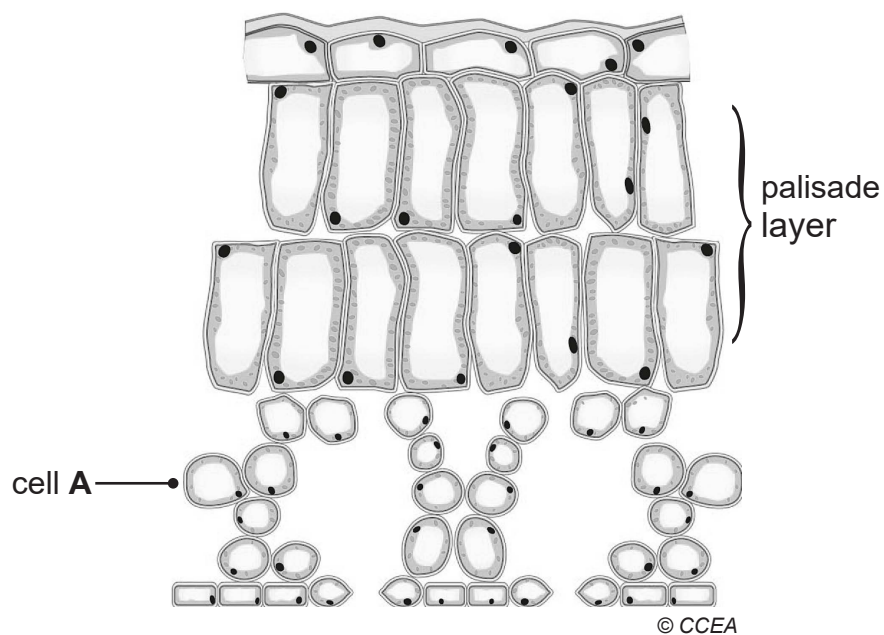
- (b) Name the reagent which needs to be heated when carrying out the food test.

[1]

[Turn over



- 2 (a) The diagram shows a cross-section of a leaf.



Look at the diagram.

- (i) Draw an enlarged diagram of **cell A** in the box below.



[4]

- (ii) Label a chloroplast on your diagram.

[1]



(b) Name the layer of the leaf where cell **A** is found.

[1]

(c) Give **two** ways cell **A** differs from a cell in the palisade layer.

1. _____

2. _____

_____ [2]

(d) Use **evidence** from the diagram to give **two** ways the palisade layer is adapted for photosynthesis.

1. _____

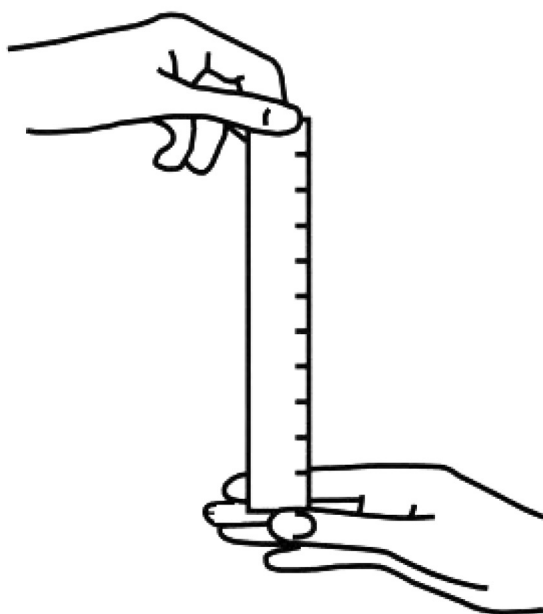
2. _____

_____ [2]

[Turn over]



- 3 The diagram shows an experiment to investigate the reaction speeds of four pupils.



Source: Chief Examiner

The teacher held a ruler above a pupil's hand.

When the teacher dropped the ruler, the pupil caught it.

The distance travelled by the ruler was recorded for each pupil in the table below.

The experiment was carried out three times for each pupil.

The table shows the results.

Pupil	Distance travelled by the ruler/mm			
	Experiment 1	Experiment 2	Experiment 3	Average
A	280	230	210	240
B	170	150	130	
C	140	100	90	110
D	220	180	140	180



Look at the table.

- (a) Give the dependent variable in this experiment.

_____ [1]

- (b) Complete the table by calculating the average distance travelled by the ruler for **pupil B**.

Show your working.

[3]

- (c) Which pupil had the fastest average reaction speed?

_____ [1]

- (d) The pupils concluded that their reaction speed improved with practice.

Use **evidence** from the table to explain how they reached this conclusion.

No data is needed in your answer.

_____ [1]

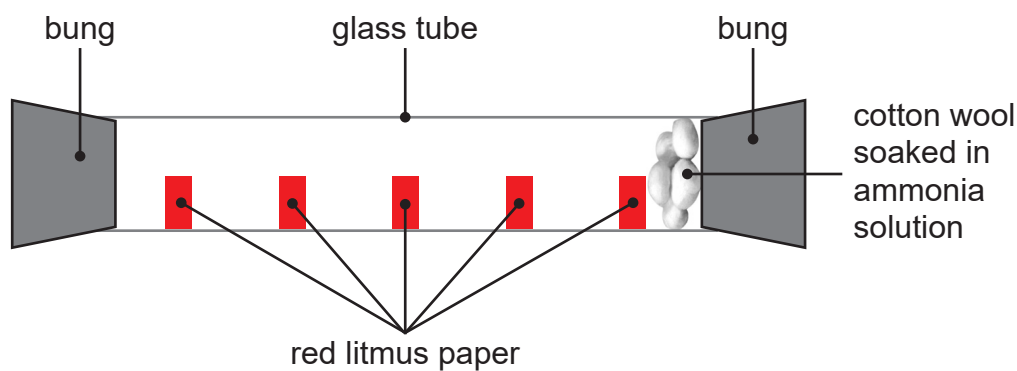
[Turn over]



- 4 Diagram A shows the apparatus used by a student to investigate diffusion.

The investigation was carried out in a fume cupboard.

Diagram A



Source: Chief Examiner

The student soaked a piece of cotton wool in ammonia solution and placed it at one end of a glass tube.

Ammonia solution gives off ammonia gas.

Ammonia gas causes red litmus paper to turn blue.

- (a) Suggest why bungs were placed in each end of the glass tube.

[1]



(b) Diagrams **B** and **C** show the experiment after two minutes and after five minutes.

Diagram B

After
2 minutes

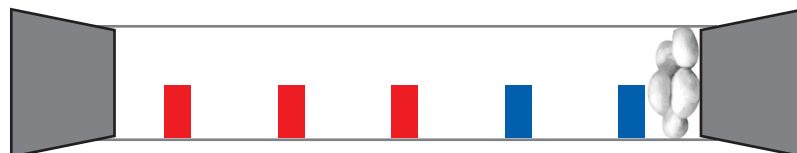
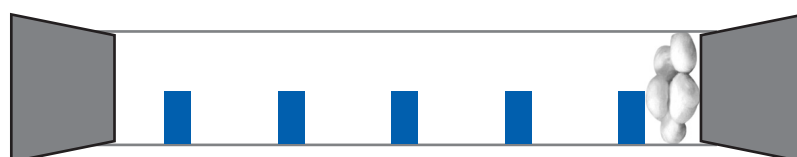
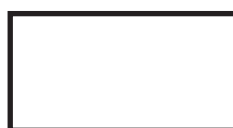


Diagram C

After
5 minutes



Box X



Look at diagrams **A**, **B** and **C**.

(i) Draw an arrow in **box X** to show the direction the ammonia gas diffused. [1]

(ii) Explain why the ammonia gas diffused in this direction.

[1]

[Turn over



(c) Describe and explain the results of this experiment if it was carried out at a **higher temperature**.

Description _____

Explanation _____

_____ [2]





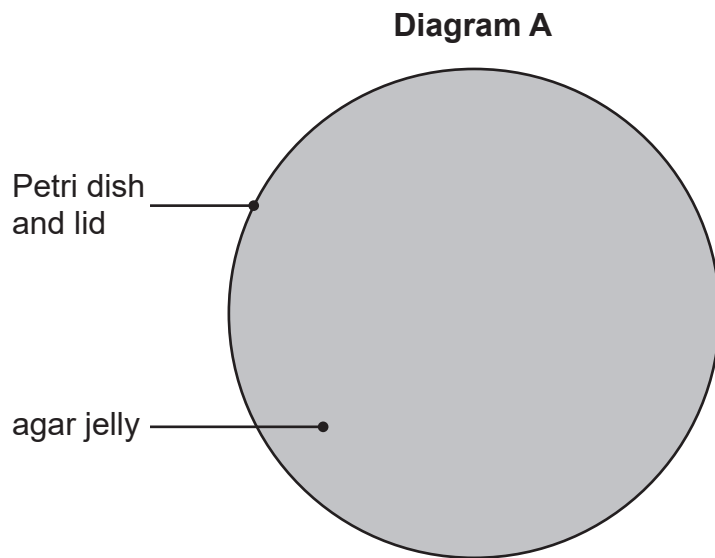
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- 5 Diagram A shows a Petri dish containing agar jelly.



Source: Chief Examiner

The student used the following apparatus to **inoculate** the agar jelly with bacteria:

- Bottle containing bacteria culture.
- Bunsen burner.
- Disinfectant spray.
- Inoculating loop.
- Sellotape.



- (a)** Describe how the student used aseptic techniques to **inoculate** the agar jelly with bacteria.

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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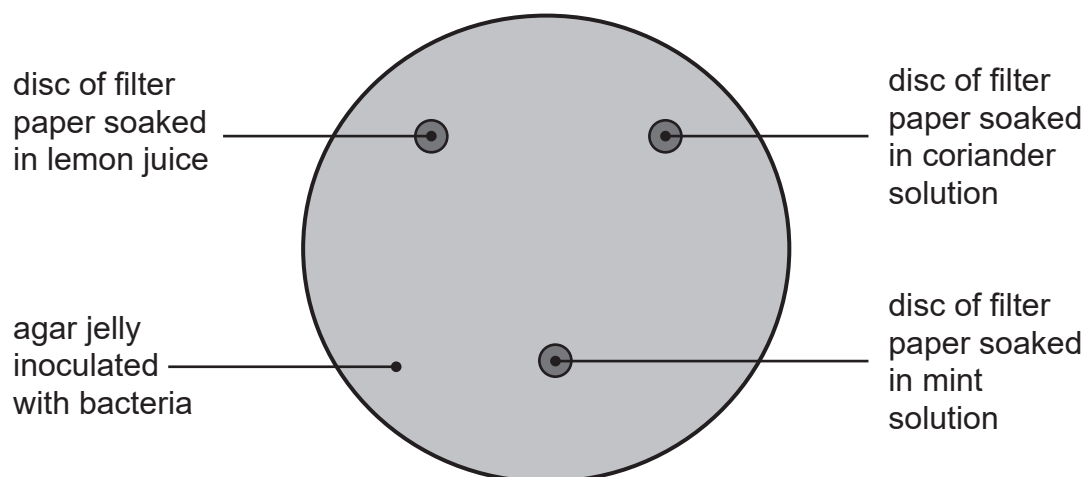
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- (b) The student investigated the effect of three different plant chemicals on the growth of bacteria.

She soaked one disc of filter paper in lemon juice, one in coriander solution and one in mint solution.

Diagram B shows the experimental set-up.

Diagram B



Source: Chief Examiner

The student incubated the Petri dish for 48 hours.

- (i) Give the maximum temperature she should have used to incubate the Petri dish.

_____ °C

[1]

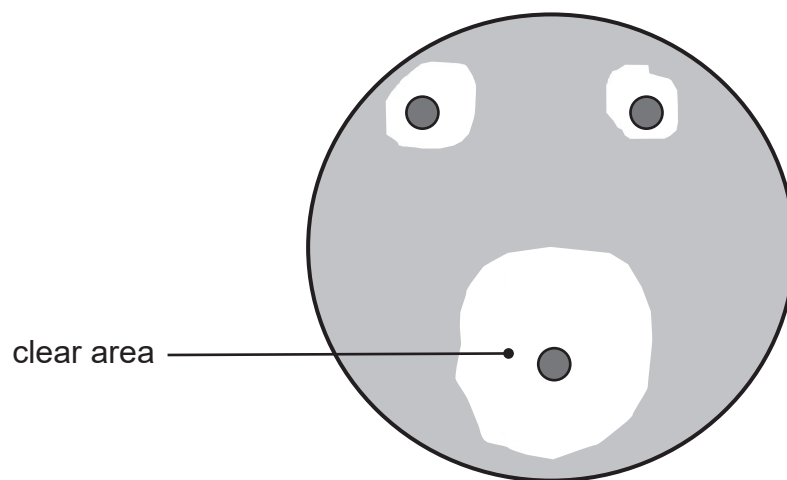
- (ii) Explain why the Petri dish should **not** be incubated above this temperature.

[1]



(c) Diagram C shows the Petri dish after 48 hours.

Diagram C



Look at diagrams B and C.

(i) Explain why a clear area appeared around each disc of filter paper.

[3]

(ii) Which plant chemical had the greatest effect on the growth of bacteria?

Use **evidence** from diagram C to support your answer.

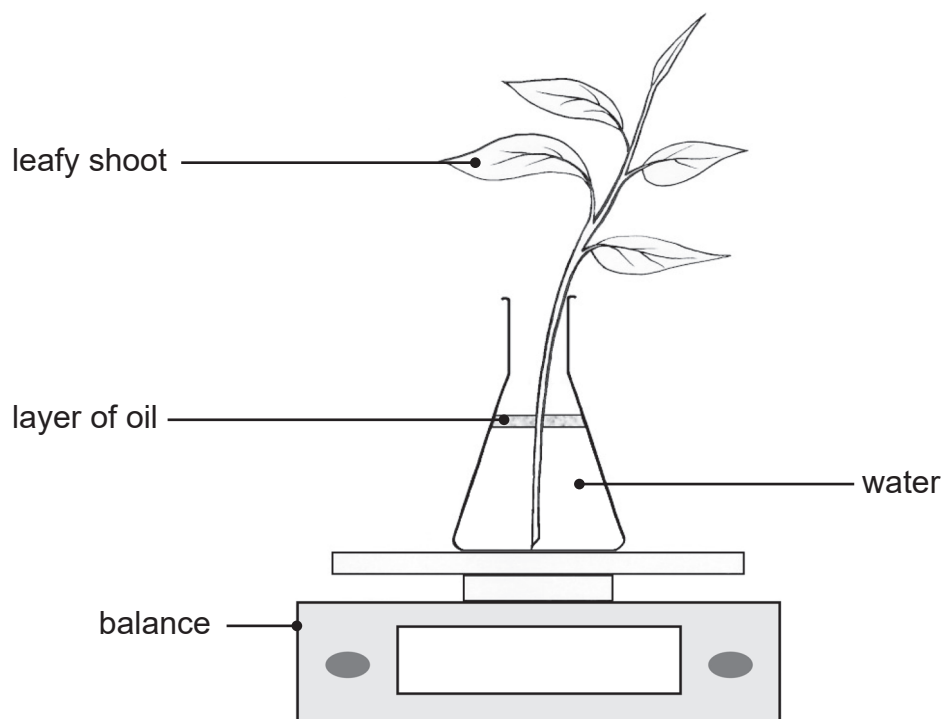
[2]

[Turn over]



- 6 (a) Pupils investigated water loss from three leafy shoots over a period of five days.

The diagram shows the apparatus they used.



Source: Chief Examiner

Look at the diagram.

- (i) Name this apparatus.

[1]

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

_____ [1]





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(b) The pupils set up the same apparatus for three different leafy shoots.

Table 1 shows the **mass** of water lost and the **rate** of water loss by each leafy shoot over a period of five days.

Table 1

Leafy shoot	Mass of water lost by leafy shoot after five days /g	Rate of water loss by leafy shoot /g per day
A	8	
B	10	2.0
C	5	1.0

Look at **Table 1**.

(i) Calculate the **rate** of water loss by leafy shoot **A**.

Show your working.

_____ g per day [2]

(ii) Suggest which leafy shoot had the largest number of leaves.

[1]



(iii) Give **three** factors the pupils should have controlled during the investigation.

1. _____

2. _____

3. _____ [3]

(c) **Table 2** shows the average number of stomata per mm² found on the leaves of each leafy shoot.

Table 2

Leafy shoot	Average number of stomata per mm ² of leaves
A	51
B	74
C	18

(i) Use **evidence from Tables 1 and 2** to give the relationship between mass of water lost and the average number of stomata per mm² of leaves.

No data is needed in your answer.

_____ [1]

(ii) Name the process of water loss from leaves by evaporation.

_____ [1]

[Turn over



7 (a) Bacteria cause milk to turn sour.

The bacteria feed on the sugar in the milk and produce lactic acid.

(i) Name the sugar present in milk.

[1]

(ii) Name the type of respiration which produces lactic acid.

[1]

The table shows the pH of a sample of milk left at room temperature for four days.

Day	pH of milk
1	6.7
2	6.5
3	6.0
4	5.3

Source: Principal Examiner

(b) Describe and explain the trend shown in the table.

No data is needed in your answer.

Description _____

Explanation _____

[3]



- (c) Describe and explain how the results would differ if the milk was left in a fridge for four days.

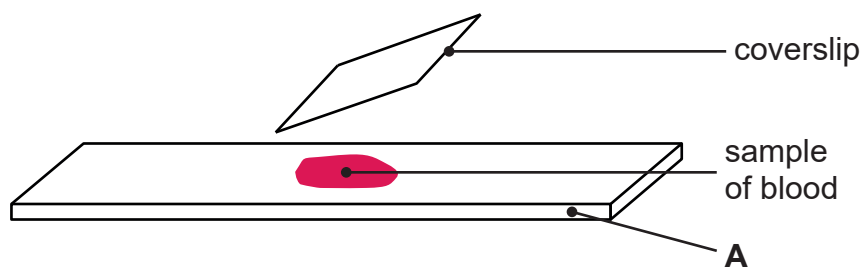
Description _____

Explanation _____

_____ [3]



- 8 (a) The diagram shows how a scientist prepared a sample of blood for viewing under a microscope.



Source: Principal Examiner

- (i) Name part A.

[1]

When preparing the sample of blood, the coverslip is gently lowered at an angle.

- (ii) Explain why.

[1]

- (iii) Why is the microscope stage moved **away** from the objective lens when focusing?

[1]

- (iv) What else must be adjusted on the microscope to get a clear view of the blood sample?

[1]





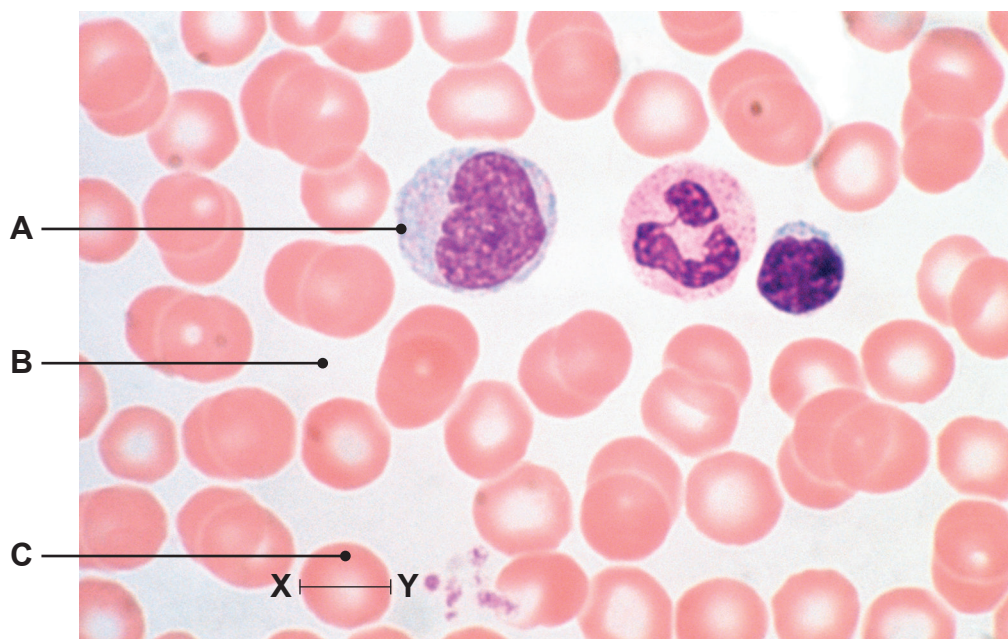
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(b) The photograph shows the sample of blood viewed under a microscope.



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(i) Name cells **A** and **C** and liquid **B**.

A _____

B _____

C _____

[3]

(ii) Measure the diameter **in mm** of cell **C** along the line **XY**.

_____ mm [1]



The photograph is magnified 1500 times.

(iii) Calculate the actual diameter of cell **C**.

Give your answer in **micrometres**.

Show your working.

Diameter _____ micrometres [4]

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Question Number	Marks
1	
2	
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8	

Total Marks	
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Examiner Number

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