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Answer ALL the questions. Write your answers in the spaces provided.

1. Food tests can be carried out on a sample of food to see if it contains certain substances.

(a) Use the correct words from the list to complete the table to show the solutions used, the colour of the solutions at the start and the colour of the solutions at the end.

Benedict's Biuret blue iodine pink black red white yellow

Substance tested for	Solution used	Colour of solution at start	Colour of solution at end	Heat required
starch				no
glucose				yes

(3)

(b) In the test for glucose the solution needs to be heated.
Give **two** precautions you would use to heat the solution safely.

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- 2
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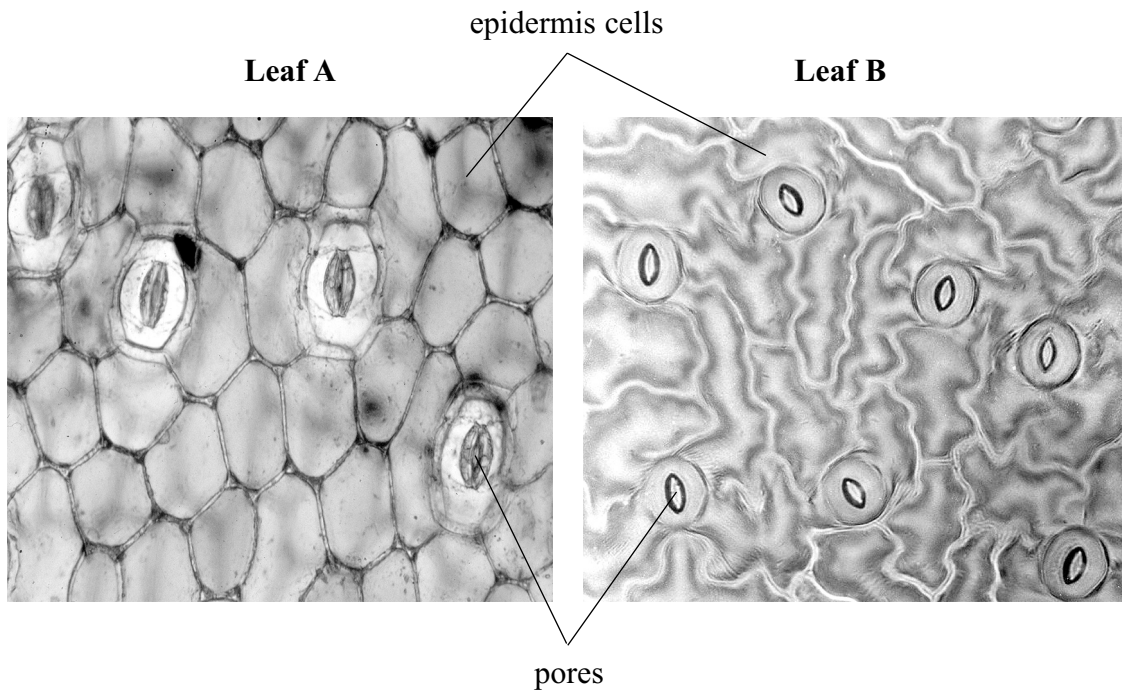
(2)

(Total 5 marks)

Q1



2. Plants absorb gas through their leaf surfaces.
The photographs show the lower surfaces of the leaves of two plant species.
The images are of the same high magnification.



- (a) (i) Name the pores labelled on the photographs.

..... (1)

- (ii) Describe how these pores change when the plant leaf is exposed to bright light in the morning.
Explain how this change benefits the plant.

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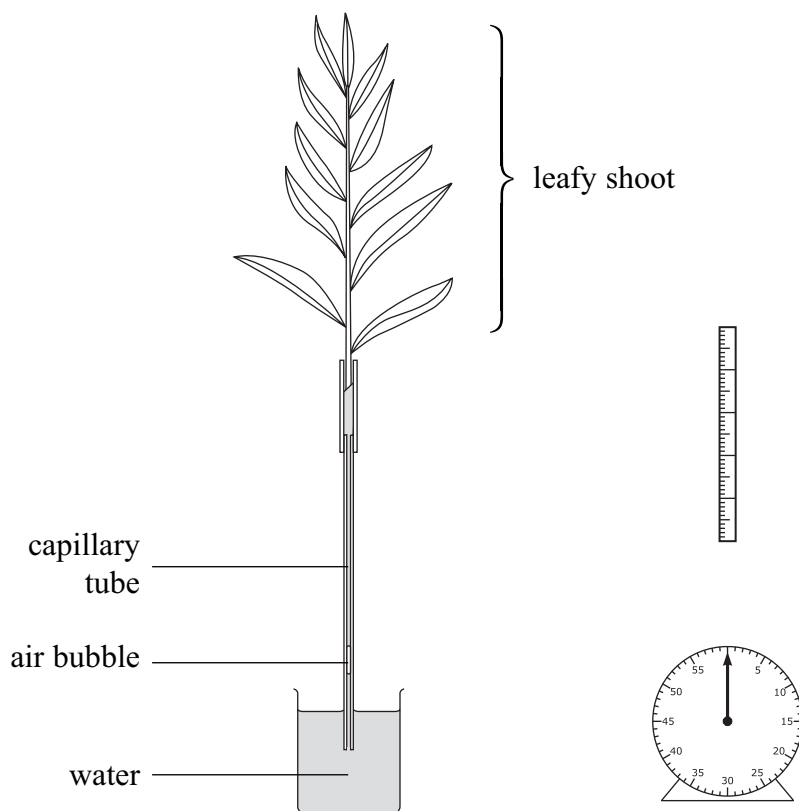


(b) Look at the photographs and complete the table.

Feature	Leaf A	Leaf B
number of pores		
shape of epidermis cells		

(3)

(c) The diagram shows apparatus that can be used to measure water loss from a leafy shoot.



(i) Describe how the apparatus is used to measure the rate of water loss.

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(3)

(ii) State **one** precaution you should take to make sure that the apparatus works correctly.

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(1)

(iii) The rate of water loss from a leafy shoot changes with a higher wind speed. Describe how you could show this using this apparatus.

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(2)

(Total 13 marks)

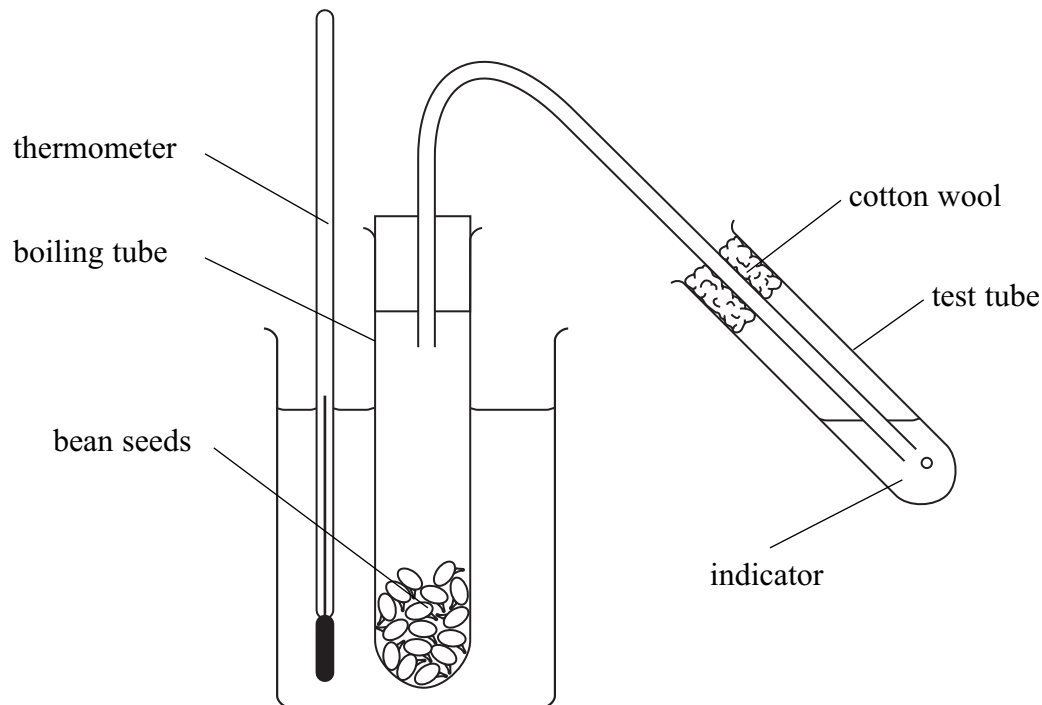
Q2

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3. Ian set up an experiment to measure the carbon dioxide gas released when bean seeds start to germinate.

He wanted to compare the rate of gas production at two different temperatures, 10 °C and 20 °C.



(a) To make sure that the gas released is carbon dioxide, Ian uses an indicator. What indicator should Ian use, and what changes would he see, as the gas is released?

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(2)

(b) Name **two** variables that need to be kept constant at each temperature.


















1

2

(2)



(c) Ian counted the number of bubbles of gas released in a minute at 10 °C and at 20 °C. He wrote his results as follows.

	
	10°C
	
	1st minute 11 bubbles
	2nd minute 9 bubbles
	3rd minute 7 bubbles
	4th minute 8 bubbles
	
	
	20°C
	
	1st minute 16 bubbles
	2nd minute 15 bubbles
	3rd minute 13 bubbles
	4th minute 11 bubbles
	
	

In the space below draw a suitable table and use it to show Ian's results.

(3)



(d) Describe and explain Ian's results.

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(2)

(e) Ian measured the rate of gas production by counting the bubbles released in a minute. Suggest a more accurate way of measuring the rate of gas production.

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(2)

(f) (i) Ian's teacher explained that the gas in the boiling tube expands as the temperature increases. Explain how this could have affected Ian's results.

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(2)

(ii) Suggest how Ian could modify his experiment to take account of this effect.

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(1)

(Total 14 marks)

Q3

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4. Describe an investigation you could do to find out the effect of carbon dioxide concentration on the movement of insect larvae.

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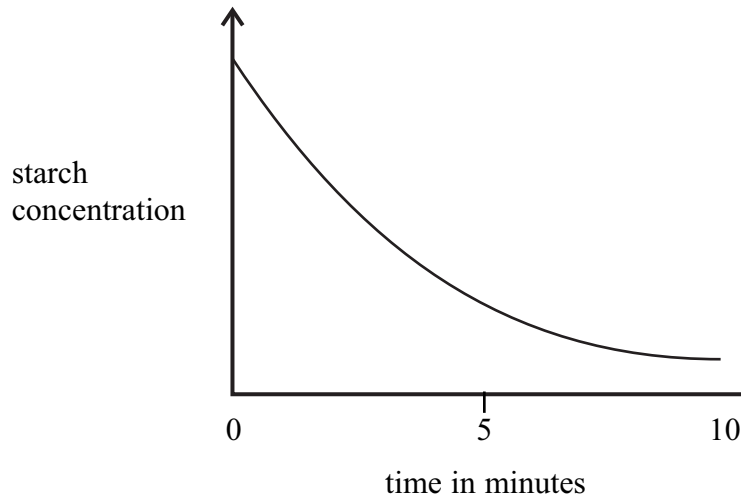
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(Total 6 marks)

Q4



5. The graph shows how the concentration of starch changes as it is digested by an enzyme.



(a) Describe how the concentration of starch changes with time.

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(2)

(b) Starch is being digested less quickly at ten minutes than at two minutes. Suggest an explanation for this.

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(1)

(c) State **one** variable that should have been kept constant during this experiment. For this variable describe how you could keep it constant.

Variable

.....

How variable kept constant

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(2)

(Total 5 marks)

Q5



6. Bethany wanted to investigate where plants of two different species tend to grow.

She wanted to see if plant species A and plant species B grew equally on the slope of a hill and on level ground in the same field.

She used a 0.5 m × 0.5 m quadrat to sample the number of the two different plant species found on the slope of a hill and on level ground.

She sampled each area three times and recorded her results in the following tables.

Slope of hill				
Quadrat	Tally of plant A	Number of plant A	Tally of plant B	Number of plant B
1	1111	4	‡‡‡‡ 111	8
2	11	2	‡‡‡‡ ‡‡‡‡ 11	12
3	1111	4	‡‡‡‡ 11	

Level ground				
Quadrat	Tally of plant A	Number of plant A	Tally of plant B	Number of plant B
1	‡‡‡‡ ‡‡‡‡ 111	13	1111	4
2	‡‡‡‡ ‡‡‡‡ 1111	14	‡‡‡‡	5
3	‡‡‡‡ 1111	9	‡‡‡‡ 1	6

(a) Complete the table to show the number of plant B in quadrat 3 on the slope of the hill.

(1)

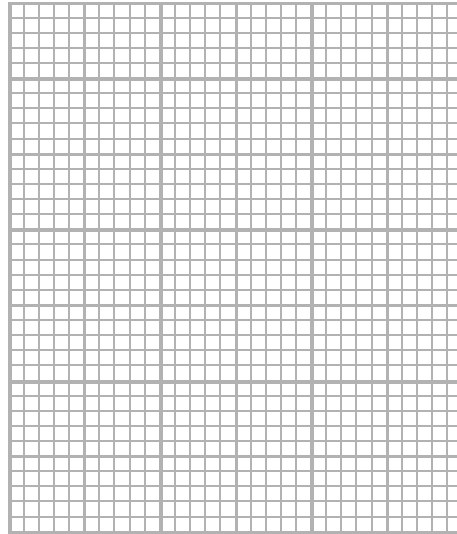
(b) (i) Complete the table below by calculating the mean number of plant B per quadrat growing on the slope of the hill.

Area	Mean number of plant A	Mean number of plant B
Slope of hill	3.33	
Level ground	12.00	5.00

(1)



(ii) On the grid below, plot a bar chart to show the mean number of plants per quadrat growing in each area.



(3)

(c) Describe how the distribution of plants A and B varies in each area.

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(2)

Q6

(Total 7 marks)

TOTAL FOR PAPER: 50 MARKS

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