



## **Cambridge IGCSE**<sup>™</sup>

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

619671766

BIOLOGY 0610/62

Paper 6 Alternative to Practical

February/March 2025

1 hour

You must answer on the question paper.

No additional materials are needed.

## **INSTRUCTIONS**

- Answer all questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do not write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

## **INFORMATION**

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

This document has 12 pages. Any blank pages are indicated.

Benedict's solution is used to test for reducing sugars. Glucose is a reducing sugar. 1 A student estimated the concentration of glucose in a solution.

The student used this method:

- Label six test-tubes 0.0%, 0.5%, 1.0%, 1.5%, 2.0% and U. Step 1
- Complete Table 1.1 by writing in the volumes of 2% glucose solution and distilled water (a) (i) needed to make 4 cm<sup>3</sup> of a 1.5% glucose solution.

Table 1.1

2

percentage concentration of glucose	volume of 2% glucose solution/cm <sup>3</sup>	volume of distilled water / cm <sup>3</sup>
0.0	0	4
0.5	1	3
1.0	2	2
1.5		
2.0	4	0

[1]

- Step 2 Use a syringe to put the volumes of 2% glucose solution shown in Table 1.1 into the test-tubes labelled 0.5%, 1.0%, 1.5% and 2.0%.
- Use the same syringe to put 4 cm<sup>3</sup> of the unknown glucose solution **U** into the test-tube Step 3 labelled **U**.
- Step 4 Use a clean syringe to put the volumes of distilled water shown in Table 1.1 into the test-tubes labelled 0.0%, 0.5%, 1.0%, and 1.5%.
- Step 5 Use a clean syringe to put 4 cm<sup>3</sup> of Benedict's solution into each of the test-tubes labelled 0.0%, 0.5%, 1.0%, 1.5%, 2.0% and U.
- Put the test-tubes into a hot water-bath at 80 °C and start the stop-clock. Step 6
- Wait for 5 minutes. Remove all the test-tubes from the water-bath. Step 7
- Step 8 Record the colour of the liquid in the test-tubes labelled 0.0%, 0.5%, 1.0%, 1.5%, 2.0% and **U**.



Fig. 1.1 shows the student's results.

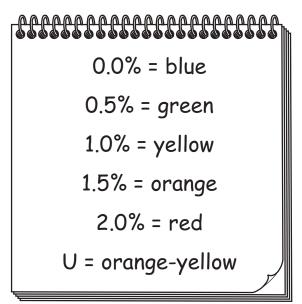


Fig. 1.1

(ii) Prepare a table and record the student's results.

[3]

(iii) Use Fig. 1.1 to estimate the percentage concentration of glucose in the unknown glucose solution U.

concentration of glucose ...... % [1]



	(iv)	State <b>two</b> variables that were kept constant in this investigation.	
		1	
		2	
			[2]
	(v)	Identify the possible source of error present in steps 2 and 3.	
		State the effect of this error on the results of the investigation.	
		error	
		effect on the results	
			[2]
(b)		s contain a protein called albumen. Albumen will turn from cloudy to clear when in ested by pepsin, a protease enzyme.	t is
	Plar	an investigation to determine the effect of pH on the digestion of albumen by proteas	e.
			[6]

(c)

* 000080	0000005 *	

5

Describe how to do the emulsion test to show that fat is present in a food sample.
[2]
[Total: 17]



2 (a) Fig. 2.1 is a photograph of a leaf from an oak tree, Quercus sp.

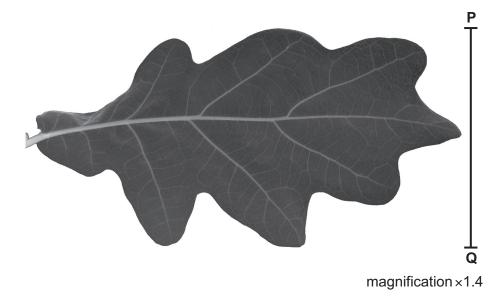


Fig. 2.1

i) Draw a large diagram of the whole oak leaf shown in Fig. 2.1.



(ii) Line PQ on Fig. 2.1 represents the width of the oak leaf.

Measure the length of line PQ on Fig. 2.1.

length of PQ ..... mm

Calculate the actual width of the oak leaf using the formula and your measurement.

magnification =  $\frac{\text{length of line } PQ \text{ in Fig. 2.1}}{\text{actual width of the oak leaf}}$ 

Give your answer to **two** significant figures.

Space for working.

..... mm [3]

[Turn over

Fig. 2.2 shows photographs of the oak leaf and a hollyhock (Alcea rosea) leaf.

The magnification of both photographs is **not** the same.

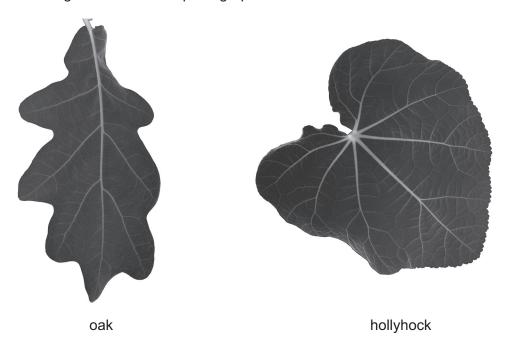


Fig. 2.2

Table 2.1 gives one visible difference between the oak leaf and the hollyhock leaf shown in Fig. 2.2.

Complete Table 2.1 to give two other visible differences between the leaves shown in Fig. 2.2.

Do not include references to size in your answer.

Table 2.1

difference	oak leaf	hollyhock leaf
1	The oak leaf is longer than it is wide.	The length and width of the hollyhock leaf are similar.
2		
3		

- **(b)** Students investigated the effect of light intensity on the surface area of leaves of soybean plants.
  - 100 soybean seeds were planted in pots and put into the shade (low light).
  - 100 soybean seeds were planted in pots and put into full sun.
  - The soybean seeds were allowed to germinate and grow for 30 days.
  - After 30 days, three of the oldest leaves and three of the youngest leaves were removed from each plant.
  - The surface area of each of the removed leaves was measured.

(i)	State the dependent variable in this investigation.	
		[1]
(ii)	State why the students used a large number of soybean plants.	
		[1]

(iii) The students estimated the surface area of each leaf using graph paper as shown in Fig. 2.3.

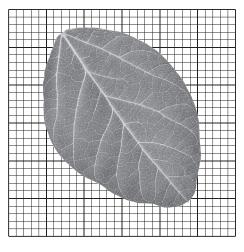


Fig. 2.3

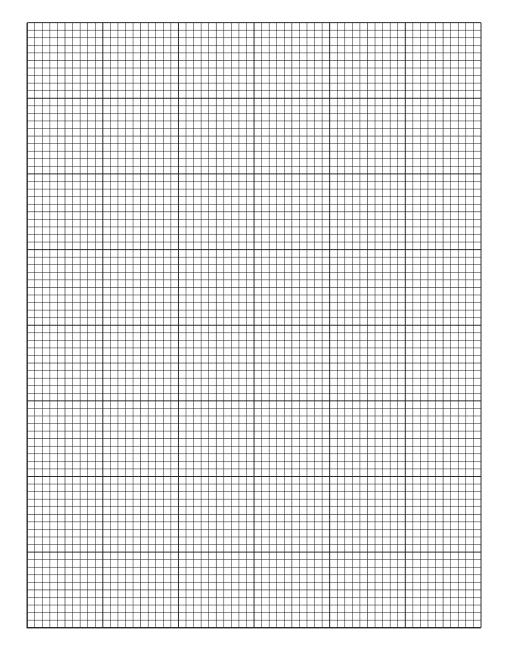
Suggest leaf.	t how	the	stude	nts ı	used	the	graph	n pap	er to	mea	sure 1	the	surface	e area	of	each
											•••••					
																. [2]

(c) The results of the investigation are shown in Table 2.2.

Table 2.2

lighting condition	age of leaves	mean surface area of leaves/cm <sup>2</sup>
full sun	young	52
shade	young	45
full sun	old	78
shade	old	58

(i) On the grid, using the data in Table 2.2, plot a bar chart to show the results of the investigation.





The students calculated that there was a 15.6% increase in the size of the young leaves when they were grown in full sun compared to in the shade.

11

Calculate the percentage increase in the surface area of the old leaves that had been grown in full sun conditions compared to the old leaves that had been grown in the shade.

Give your answer to one decimal place.

		% [	3]
	(iii)	State <b>two</b> conclusions from this investigation.	
		1	
		2	
		[	 2]
(d)	Hyd	rogencarbonate indicator is used to test for the presence of carbon dioxide.	
		aquatic plant was placed in red hydrogencarbonate indicator and put under bright light plant takes in carbon dioxide as it photosynthesises.	ıt.
	Stat	te the final colour of the hydrogencarbonate indicator.	
		[	1]

[Total: 23]

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