Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/32**

Paper 3 Practical Test **May/June 2025**

1 hour 30 minutes

You must answer on the question paper.

You will need: The materials and apparatus listed in the confidential instructions

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 [ ].

For Examiner's Use	
1	
2	
3	
Total	

This document has **8** pages.

[Turn over

In order to plan the best use of your time, read through all the questions on this paper carefully before starting work.

1 Catalase is an enzyme found in living cells. This enzyme catalyses the breakdown of hydrogen peroxide into oxygen and water. Some plant cells are a source of catalase.

If some material from a plant is crushed and added to water, a suspension of the contents of the plant's cells can be obtained.

When hydrogen peroxide solution is added to this suspension, any oxygen produced is released as bubbles of gas. These bubbles collect to form a foam on top of the suspension, as shown in Fig. 1.1. Greater height indicates greater catalase activity.

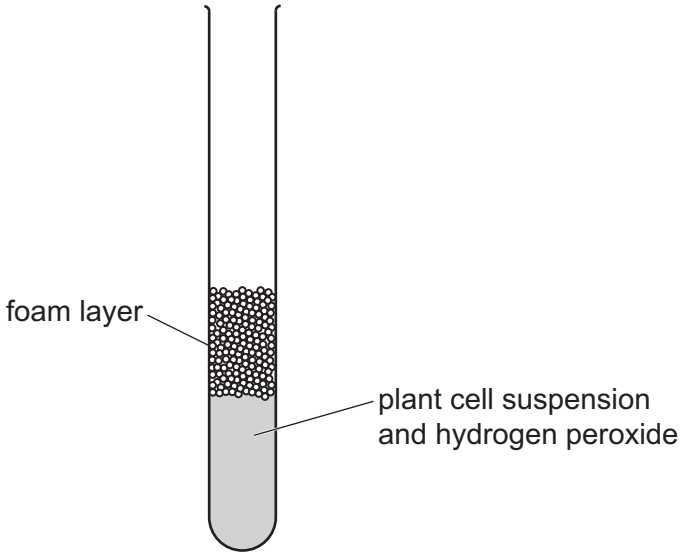


Fig. 1.1

You are going to investigate the activity of catalase in three different suspensions of plant cells, celery, apple and potato.

(a) Read these instructions and then answer **(a)(i)**:

- use a clean stirring rod to stir the celery cell suspension in the beaker
- pour the celery cell suspension into a clean, large test-tube to a depth of 2 cm
- use a clean syringe to add 5 cm^3 of hydrogen peroxide to this large test-tube
- immediately start timing
- measure the total height of any foam layer produced every 30 seconds for 2 minutes, recording your measurements
- repeat these instructions using the apple cell suspension and then the potato cell suspension.

(i) Draw a table in which to record your measurements.

[5]

(ii) Now carry out the instructions in **(a)** and enter your results in your table. [3]

(b) (i) Suggest why the three plant tissues were crushed before adding the hydrogen peroxide solution.

.....

..... [1]

(ii) Suggest why the plant suspensions were stirred before adding the hydrogen peroxide solution.

.....

.....

..... [2]

(iii) State **one** variable that was controlled in this investigation.

.....

..... [1]

(iv) Suggest **one** reason why repeating the investigation would give you more confidence in your results.

.....

..... [1]

(v) Describe a difficulty you encountered in obtaining your results.

.....

.....

..... [1]

(c) Another student used the same procedure using a celery cell suspension and hydrogen peroxide. Instead of using a test-tube, they used a measuring cylinder. They measured the total volume of the contents of the measuring cylinder every minute for 5 minutes.

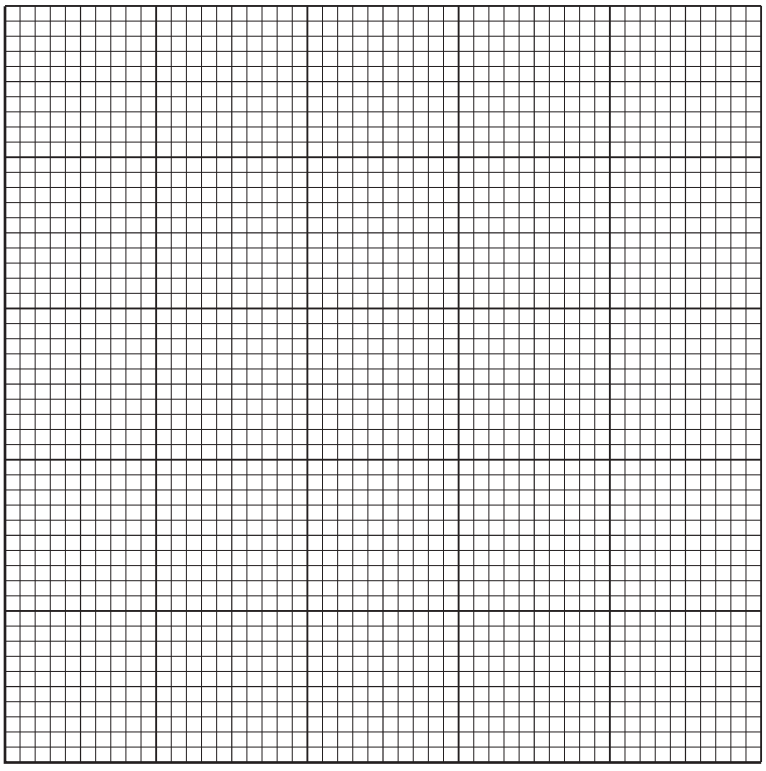
These measurements are shown in Table 1.1. The student did not record the measurement at 4 minutes.

Table 1.1

time / minutes	total volume of contents / cm^3
0	4.0
1	11.0
2	16.0
3	19.5
5	20.5

(i) Construct a graph of the data in Table 1.1 on the grid below.

Join your plotted points with ruled, straight lines.



[4]

(ii) Use your graph to estimate the total volume of the contents of the measuring cylinder at 4 minutes.

Show your working on your graph.

total volume at 4 minutes ..... [3]

(iii) Describe and explain the shape of your graph.

.....

.....

.....

.....

..... [3]

[Total: 24]

2 Fig. 2.1 is a photomicrograph of a section of a celery plant.

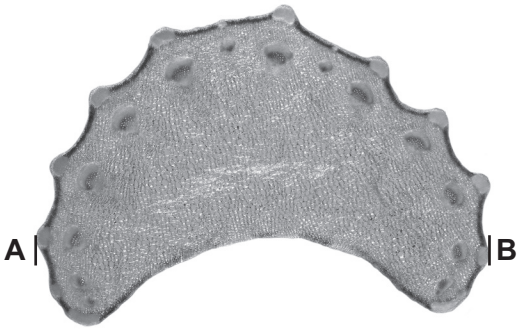


Fig. 2.1

(a) In the space below, make a large drawing of the plant section as it appears in the photomicrograph.

[5]

(b) (i) Draw a straight line to join **A** and **B** on Fig. 2.1. This is the length of the plant section in the photomicrograph. Measure and record this length.

length **A**–**B** ..... mm [1]

(ii) **On your drawing**, draw a straight line in the same position as the line **A**–**B** you have drawn on the photomicrograph. Measure and record the length of this line.

length of line on drawing ..... mm [1]

(iii) Use your measurements in **(b)(i)** and **(b)(ii)** to calculate the magnification of your drawing compared to the photomicrograph. Record your answer to 2 decimal places.

Show your working.

magnification × ..... [3]

[Total: 10]

3 Plan an investigation to find out the effect of varying light intensity on the increase in height of mustard plant seedlings provided in Petri dishes, as shown in Fig. 3.1.

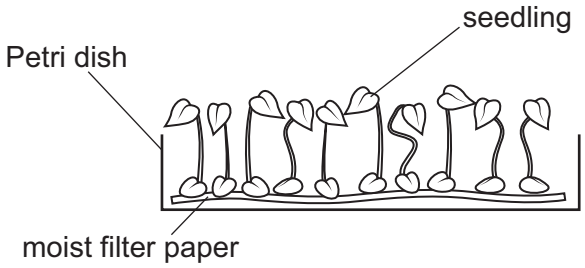


Fig. 3.1

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]