Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **5090/31**

Paper 3 Practical Test **May/June 2019**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As specified in the Confidential Instructions.

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Write your answers in the spaces provided on the Question Paper.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
Total	

This document consists of **7** printed pages and **1** blank page.

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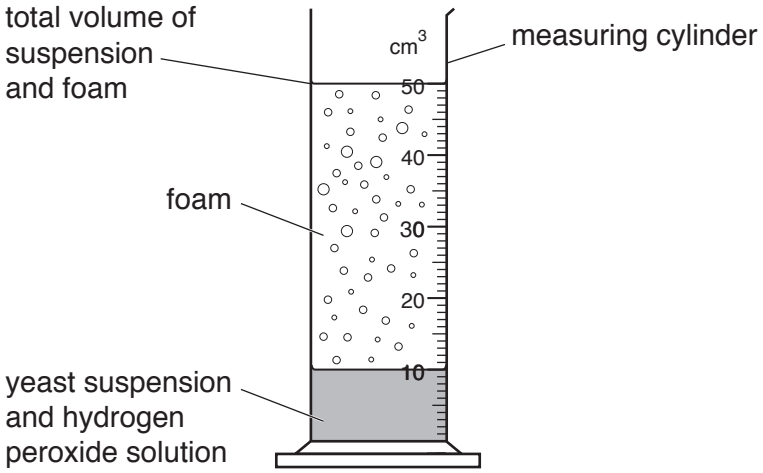
In order to plan the best use of your time, read through all the questions on this paper carefully before starting work.

1 Catalase is an enzyme found in living cells. This enzyme catalyses the breakdown of hydrogen peroxide into oxygen and water. A suspension of yeast cells in water can be used as a source of catalase.

The oxygen produced is given off as gas and causes foam to form as shown in the diagram. The larger the volume of foam produced, the greater the activity of the catalase.



You are going to investigate the activity of the enzyme catalase.

You are provided with a suspension of yeast cells in water as your source of catalase, and some hydrogen peroxide solution.

Use the following method:

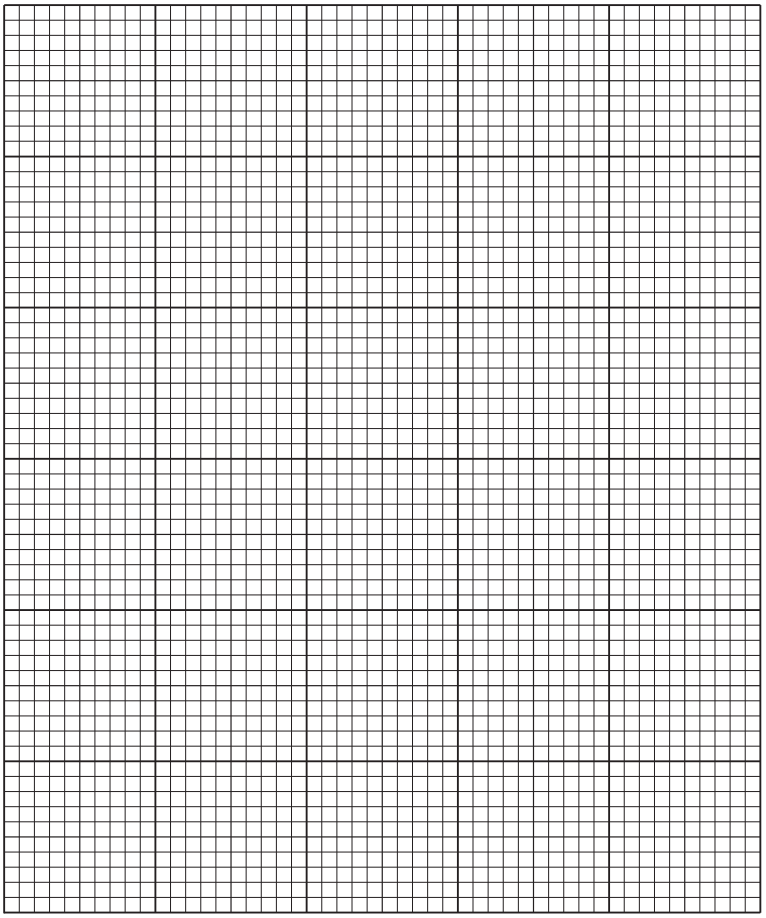
- use a stirring rod to stir the yeast suspension in the beaker
- use a syringe to add 5 cm^3 of yeast suspension to the measuring cylinder
- use a clean syringe to add 5 cm^3 of hydrogen peroxide solution to the measuring cylinder
- immediately start timing
- after 1 minute measure the total volume of the suspension, including any foam formed on top, and record this in the table
- repeat the measurement after every minute for 5 minutes, recording the results in the table.

(a)

time / minutes	total volume of suspension and foam / cm^3
0	10
1	
2	
3	
4	
5	

[2]

(b) **(i)** On the grid provided, plot a line graph of the data in the table. Join the points with ruled lines.



[4]

(ii) Use the results to state the time period during which catalase activity was the greatest.

..... [2]

(iii) Describe the shape of the graph.

.....

.....

.....

..... [2]

(c) **(i)** Suggest reasons for

- stirring the yeast suspension at the start of the experiment

  .....

  .....

- using different syringes for measuring the yeast suspension and the hydrogen peroxide solution.

  .....

  .....
  [2]

(ii) Suggest a source of inaccuracy in the method for this experiment.

.....

..... [1]

(d) Design an experiment based on the method already described (see page 2) to investigate the effect of **increasing temperature** on the activity of catalase. Give full experimental details.

.....

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.....

.....

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.....

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..... [6]

[Total: 19]

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Question 2 starts on page 6.

2 The photograph shows an apple cut in half.

(a) In the space below make a large drawing of the apple as it appears in the photograph. Label a seed on your drawing.

[5]

(b) **(i)** Draw a straight line between the lines labelled **A** and **B** on the photograph. Measure and record the length of your line.

measurement ..... mm [1]

(ii) Draw a straight line in a similar position on your drawing. Measure and record the length of your line.

measurement ..... mm [2]

(iii) Use your measurements to calculate the magnification of your drawing compared with the apple as it appears in the photograph. Show your working.

magnification × ..... [2]

(c) A student carried out three tests on the apple, one with iodine solution, one with biuret solution and one with Benedict's solution, to discover its nutrient content.

(i) State which test required the use of heat.

..... [1]

(ii) The apple tested positive with Benedict's solution and negative with both biuret solution and iodine solution. Use this information to complete the table with the student's observations at the end of the tests.

test solution	observation	conclusion
Benedict's solution		positive
biuret solution		negative
iodine solution		negative

[3]

(iii) State what these results tell you about the nutrient content of the apple.

.....

..... [2]

(d) **(i)** Describe how the student could test the apple for the presence of fat. Include the observation for a positive result.

.....

.....

..... [3]

(ii) State and explain a safety precaution the student must take when carrying out the fat test in **(d)(i)**.

precaution .....

explanation.....

.....

[2]

[Total: 21]

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