Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

9104335119

BIOLOGY **5090/31**

Paper 3 Practical Test **May/June 2022**

1 hour 15 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	
Total	

This document has **8** pages. Any blank pages are indicated.

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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 Enzymes are used in the fruit juice industry to help with the extraction of juice from fruit.

You are going to investigate the extraction of juice from some crushed apple.

You are provided with two beakers of crushed apple, a solution of an enzyme, two measuring cylinders, two filter funnels and some filter paper.

Use the following method:

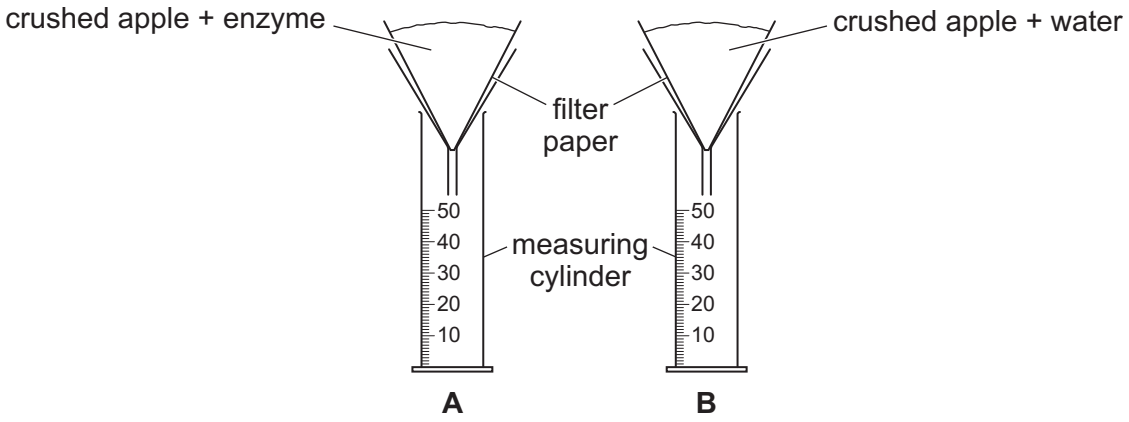
- label one beaker of crushed apple **A** and the other beaker of crushed apple **B**
- label one measuring cylinder **A** and the other measuring cylinder **B**
- place a filter funnel with filter paper in the top of each of the measuring cylinders
- use a syringe to add 2 cm^3 enzyme solution to beaker **A**
- use a clean syringe to add 2 cm^3 distilled water to beaker **B**
- use a stirring rod to mix the contents of beaker **A**
- clean the stirring rod and then use it to mix the contents of beaker **B**
- leave the beakers for five minutes.

Whilst waiting you can continue with **(a)(i)** and **(g)**.

After the beakers of crushed apple have been left for five minutes, fill the filter paper in measuring cylinder **A** with crushed apple from beaker **A** and the filter paper in measuring cylinder **B** with crushed apple from beaker **B** as shown in the diagram. Start timing (this is 0 minutes).

Any apple juice extracted will drip through the filter paper into the measuring cylinder.

You are going to measure and record the volume of juice in each of the measuring cylinders every 2 minutes for 10 minutes.



(a) **(i)** Complete the table headings by inserting the units. [1]

(ii) Record in the table the volume of juice in measuring cylinders **A** and **B** every 2 minutes for 10 minutes. [4]

time /	**total volume of juice collected / .....**	
	A	**B**
0	0.0	0.0
2		
4		
6		
8		
10		

(b) Use your results to suggest why the use of this enzyme is an advantage in the fruit juice industry.

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.....

.....

..... [3]

(c) Suggest reasons for:

(i) stirring the contents of beakers **A** and **B**

.....

..... [1]

(ii) using a clean stirring rod to stir the contents of beaker **B**.

.....

..... [1]

(d) Explain how the contents of beaker **B** act as a control.

.....

.....

..... [2]

(e) **(i)** Some other students did a similar experiment to extract some juice from pears. Their results were:

Start 0 cm^3

After 2 minutes, 12.0 cm^3

After 4 minutes, 18.5 cm^3

After 6 minutes, 21.0 cm^3

After 8 minutes, 21.5 cm^3

After 10 minutes, 22.0 cm^3

Use the students' results to construct a line graph. Join your points with ruled, straight lines.

[4]

(ii) Use your graph to estimate the volume of juice collected at five minutes. Show your working on your graph.

volume of juice collected at five minutes ..... [3]

(f) Design an experiment, based on the method you have used, to investigate the effect of the enzyme on the production of juice from different varieties (types) of apple.

Give full experimental details.

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..... [6]

(g) A student tested some apple juice for the presence of reducing sugar and observed a red colour.

Name the testing solution the student used, state a temperature at which the test was carried out and a conclusion for the student's observation.

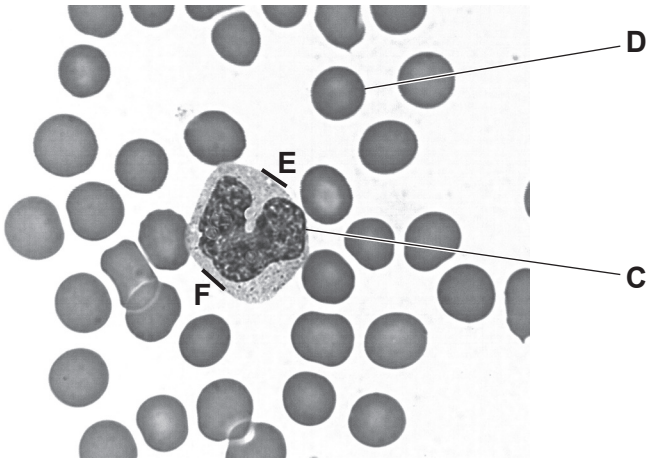
testing solution .....

temperature .....

conclusion .....
[3]

[Total: 28]

2 The photomicrograph shows some human blood cells.



(a) In the space below make a large drawing of the cell labelled **C** as it appears in the photomicrograph.

[4]

(b) Complete the table by describing **three visible** differences between cell **C** and cell **D**.

	cell C	**cell D**
1		
2		
3		

[3]

(c) **(i)** Draw a straight line on the photomicrograph to join **E** and **F**.

Measure and record the length of this line.

length of line **E–F** ..... mm [1]

(ii) On your drawing, draw a straight line at the same location as the line **E–F**.

Measure and record the length of this line.

length of line on drawing ..... mm [2]

(iii) Use your measurements in **(i)** and **(ii)** to calculate the magnification of your drawing compared to the photomicrograph. Give your answer to 1 decimal place.

Space for working.

magnification × ..... [2]

[Total: 12]

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