Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

7714138825

BIOLOGY **5090/32**

Paper 3 Practical Test **October/November 2016**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As listed 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.

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	
3	
Total	

This document consists of **11** 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 Fig. 1.1 shows a flower.



Fig. 1.1

(a) (i) Describe **two** visible features of this flower that suggest it is likely to be insect-pollinated rather than wind-pollinated.

1 .....

.....

2 .....

.....

[2]

(ii) Make a large drawing of the structures of the flower shown within the box on Fig. 1.1.

[4]

(iii) **On your drawing** label the following structures with a label line, the appropriate letter and its biological name:

A the part of the flower in which pollen grains are produced

B the part of the flower to which the pollen grains are transferred during pollination

C the part of the flower through which the pollen tube grows after pollination. [3]

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[Turn over

After pollination and fertilisation have taken place in a flower, a fruit containing seeds develops.

You are provided with halves of two fruits, one ripe and the other unripe.

Cut each half fruit into two pieces.

Test a piece of the ripe fruit and a piece of the unripe fruit for starch using iodine solution.

Test a piece of the ripe fruit and a piece of the unripe fruit for reducing sugar using Benedict's solution and a water bath.

Raise your hand to request hot water when you need it.

(b) (i) Record your results and state your conclusions in Table 1.1.

Table 1.1

test	**ripe fruit**		**unripe fruit**	
	result	**conclusion**	**result**	**conclusion**
starch				
reducing sugar				

[4]

(ii) Suggest how the seed(s) in the ripe fruit may be dispersed, giving reasons for your suggestion.

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.....[3]

[Total: 16]

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2 Catalase is an enzyme found in living plant and animal tissue. It catalyses the breakdown of hydrogen peroxide into water and oxygen.

$$2H_2O_2 \rightarrow 2H_2O + O_2$$

hydrogen peroxide — water — oxygen

You are provided with large pieces of raw, unboiled potato, 3 cm in length, and some pieces of boiled potato of the same length.

You are going to observe the reaction between raw potato and hydrogen peroxide solution.

- Put on the eye safety protection provided.
- Use the forceps to place one large piece of **raw** potato carefully into one of the large test-tubes containing hydrogen peroxide solution.

(a) Describe your observations.

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.....[1]

(b) (i) Read through the following instructions before beginning the experiment.

The activity of catalase can be measured by counting the bubbles of oxygen gas released using the apparatus shown in Fig. 2.1.

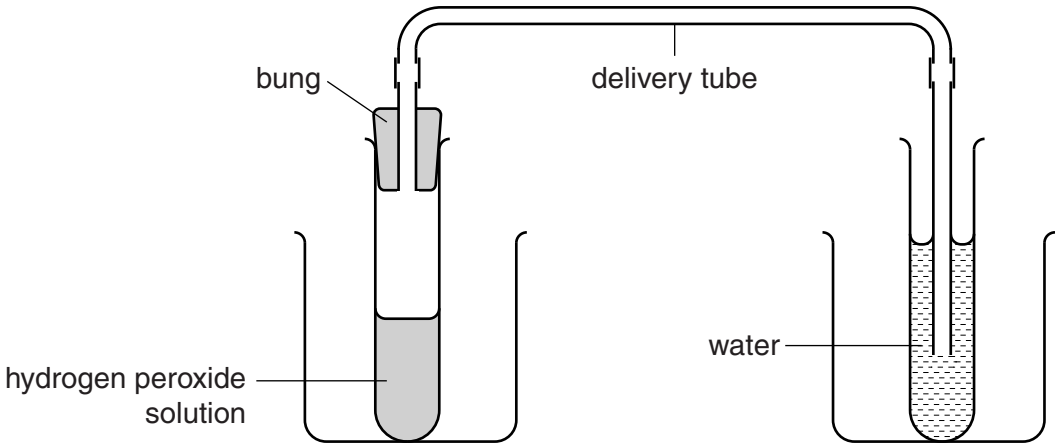


Fig. 2.1

- Remove the bung from the test-tube of hydrogen peroxide solution.
- Place a fresh, large piece of **raw** potato in the hydrogen peroxide solution using the forceps provided.
- Quickly replace the bung and ensure that the end of the delivery tube is under the surface of the water in the test-tube.
- Count the number of oxygen bubbles released from the end of the delivery tube in 1 minute.
- Record your result in Table 2.1.
- Cut the remaining large piece of **raw** potato into 6 smaller pieces.
- Repeat the procedure to count the number of oxygen bubbles released in 1 minute, using a fresh test-tube of hydrogen peroxide solution and the 6 smaller pieces of **raw** potato.
- Record your result in Table 2.1.
- Repeat both of these experiments with fresh test-tubes of hydrogen peroxide solution and the **boiled** potato.
- Record your results in Table 2.1.

Table 2.1

pieces of potato	number of bubbles released in 1 min
one large, raw	
six small, raw	
one large, boiled	
six small, boiled	

[4]

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(ii) Describe and explain what your results show about the activity of catalase.

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.....[4]

(c) Suggest how you could test that the gas released was oxygen.

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.....[2]

(d) Suggest how you could improve the method used in this investigation to obtain more valid and reliable results.

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.....[4]

[Total: 15]

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3 Two students measured how good their reactions were by using a metre ruler as shown in Fig. 3.1. The reaction being tested was catching a falling metre ruler.

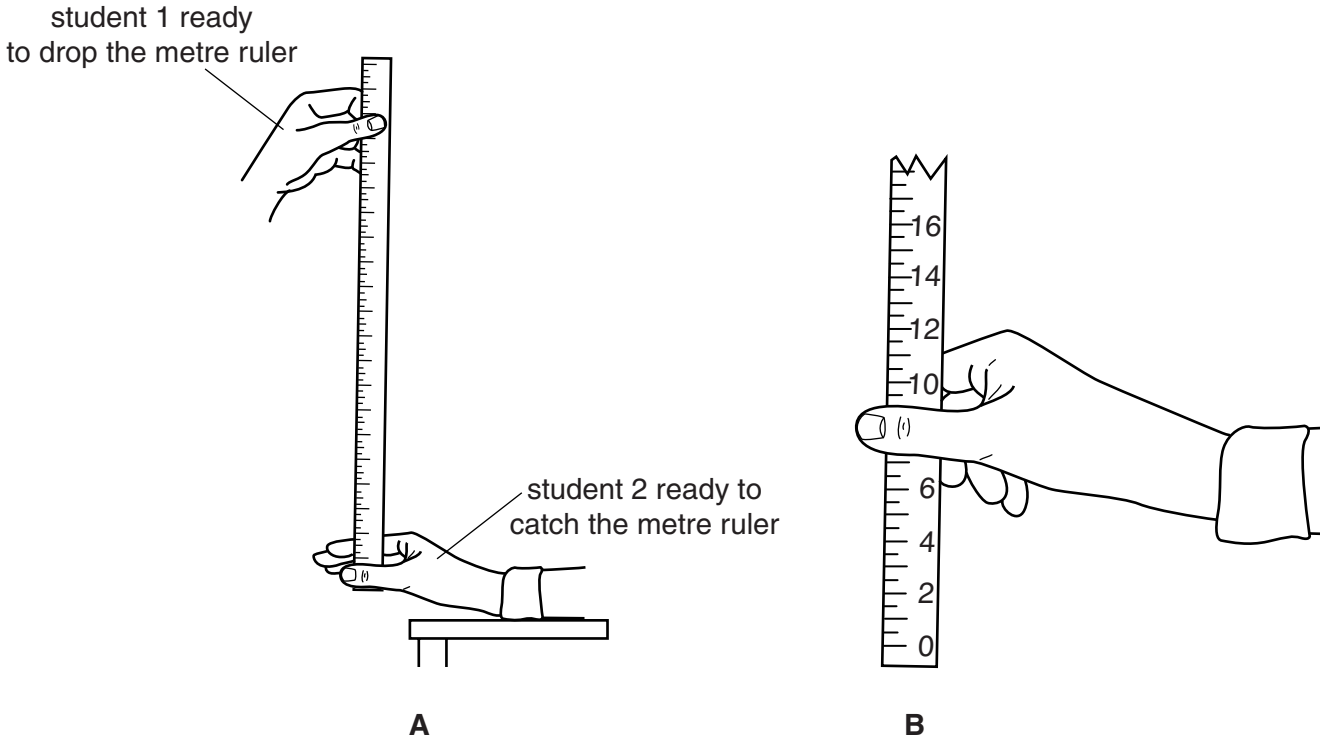


Fig. 3.1

Student 1 held the metre ruler near the 100 cm end so that when they let it drop, student 2 would be able to catch it between the thumb and fingers that were held open ready at the 0 cm end of the metre ruler. The measurement on the metre ruler where it was caught by student 2 was recorded. The students then swapped so that student 2 dropped the ruler and student 1 caught it. The ruler was dropped and caught a total of 5 times by each student.

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[Turn over

The results obtained by the students were:

Student 1: 16.0 cm ; 12.0 cm ; 10.0 cm ; 15.0 cm ; 7.0 cm

Student 2: 18.0 cm ; 15.5 cm ; 12.0 cm ; 51.0 cm ; 12.5 cm

(a) (i) Draw a table that could be used to display these results.

[3]

(ii) Calculate the mean result for student 1.

..... cm [1]

(iii) Suggest why, when calculating the mean result for student 2, the result of 51.0 cm should be omitted.

.....

.....[1]

(iv) Suggest an explanation for this result of 51.0 cm.

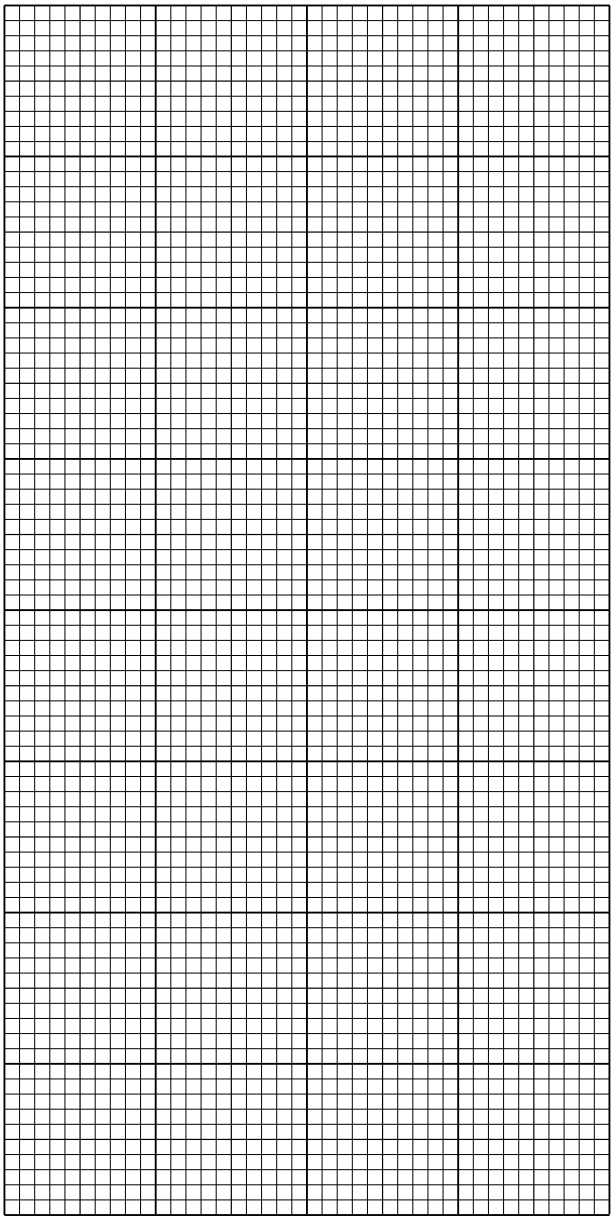
.....

.....[1]

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(v) Construct a bar chart of the mean results obtained for the two students.

The mean result calculated for student 2 was 14.5 cm (omitting the 51.0 cm reading from the calculation).



[3]

[Total: 9]

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