Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/32**

Paper 3 Practical Test **October/November 2017**

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	
3	
Total	

This document consists of **8** printed pages.

CAMBRIDGE International Examinations

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

1 You are going to carry out an investigation to determine the concentration of glucose solution **X**. Benedict's solution is used to test for reducing sugars, such as glucose.

You are provided with Benedict's solution and 5 test-tubes containing 5 cm^3 of:

distilled water labelled **W**
0.2% glucose solution labelled **A**
0.4% glucose solution labelled **B**
0.6% glucose solution labelled **C**
unknown glucose solution labelled **X**.

- Using the measuring cylinder or syringe provided, add 5 cm^3 of Benedict's solution to each of these 5 test-tubes.
- Put the test-tubes in a beaker to act as a water bath.
- When ready, raise your hand to request hot water which the Supervisor will pour into your water bath. **Caution: the water will be hot**.
- Note the time when the hot water was added to the water bath .....
- Leave the test-tubes for 10 minutes. **While you are waiting, answer question 1(c)**.

(a) After 10 minutes remove the test-tubes from the water bath and place them in the test-tube rack.

Record the time .....

Observe the appearance of the contents of each test-tube and record your observations in Table 1.1.

Table 1.1

test-tube	glucose solution concentration (%)	observations
W	0.0 (distilled water)	
A	0.2	
B	0.4	
C	0.6	
X	unknown	

[4]

Leave the test-tubes in the rack for a further twenty minutes.

While you are waiting continue with the other questions.

(b) (i) Using your observations in Table 1.1, estimate the % concentration of glucose solution **X**.

concentration of glucose solution **X** ..... [1]

(ii) Explain how you reached this estimate.

.....

.....[1]

(iii) Suggest how you could determine a more accurate % concentration for glucose solution **X**.

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.....[2]

(c) You are given a 1.0% glucose solution. Describe in detail how you would use it to produce 5 cm^3 of a 0.5% glucose solution.

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.....[3]

(d) Explain why you were asked to test the distilled water with Benedict's solution.

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.....[1]

After the test-tubes have been left for twenty minutes, observe them and answer questions 1 (e)(i) and (ii).

(e) (i) Describe any differences in appearance of the contents of the test-tubes containing glucose solution, after they have been left in the rack for twenty minutes.

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.....[2]

(ii) Solids are often formed after the Benedict's test. Suggest how you could separate any solid produced after the test and obtain its mass.

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.....[2]

[Total: 16]

2 You are provided with a piece of the root of a carrot plant.

- Use the scalpel or knife to cut across the diameter of the root to expose a fresh surface.

(a) (i) Make a large drawing of this freshly cut surface in the space below. On your drawing, label the vascular tissue.

[4]

(ii) Measure the diameter of the cut surface of your carrot and record it.

..... mm

On your drawing, draw a line showing where you measured your carrot.
Measure this line on your drawing and record it.

..... mm

Calculate the magnification of your drawing. Show your working.

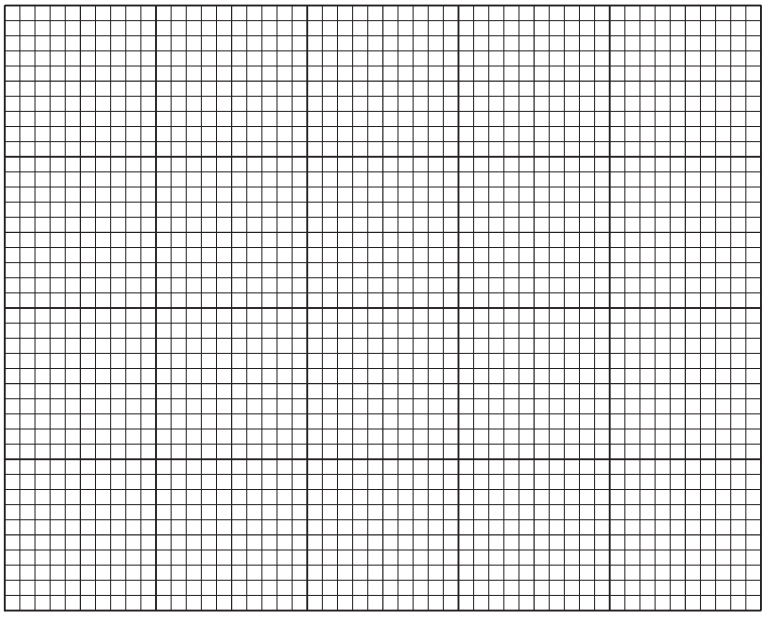
magnification × .....
[4]

(b) Carrots are a source of vitamin C. Some students measured the vitamin C content of fresh and frozen carrots and then measured it again after the carrots had been cooked in boiling water. Their results are shown in Table 2.1.

Table 2.1

carrots	vitamin C/mg per 100 g
fresh, uncooked	5.9
fresh, boiled	3.6
frozen, uncooked	2.5
frozen, boiled	2.3

(i) Construct a bar chart of the data in Table 2.1 on the grid below.



[4]

(ii) Suggest **two** conclusions the students could reach from these results.

1 .....

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2 .....

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[2]

(iii) Carrots can be cooked by heating them in an oven or boiling them in water.

You want to investigate the effect of these two cooking methods on the vitamin C content of the cooked carrot.

Describe in detail how you would carry out this investigation.

There is a simple test that can be used to measure vitamin C content. You do not need to know this test. Simply refer to **the vitamin C test** in your answer.

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.....[4]

[Total: 18]

3 Fig. 3.1 shows a photomicrograph of red blood cells of a person suffering from sickle cell anaemia. Both normal and abnormal red blood cells are shown.

Fig. 3.1

(a) Use Fig. 3.1 to complete this table:

	normal red blood cells	**abnormal red blood cells**
number of whole cells		4
shape		
size		

[4]

(b) The abnormal cells are very rigid and cannot easily bend. This, and their different shape, can lead to problems in the circulation of blood in a person suffering from sickle cell anaemia. Suggest why.

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.....[2]

[Total: 6]