Cambridge O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **5090/62**

Paper 6 Alternative to Practical **October/November 2017**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

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.

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

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Answer **all** the questions in the spaces provided.

1 Glucose is a reducing sugar. Benedict's solution is used to test for the presence of reducing sugar.

(a) Describe how you would use Benedict's solution to test for reducing sugar in a piece of potato. Include details of a safety precaution in your answer.

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.....[3]

Some students were given a 1.0% glucose solution and some distilled water. They diluted the glucose solution to produce five solutions of different concentrations.

The students tested each of the solutions they had prepared with Benedict's solution. The concentrations of the solutions and the results of their tests are shown in Table 1.1.

Table 1.1

glucose solution concentration (%)	**result of Benedict's test**
0.0 (distilled water)	.....
0.1	slightly green
0.2	green
0.3	yellow
0.4	orange
0.5	red

The students also decided to test the distilled water with Benedict's solution.

(b) **(i)** Write the result of this test in Table 1.1. [1]

(ii) Explain why the students tested the distilled water.

.....

.....[1]

(c) The students compared the colour of their solutions after the same length of time. State **three other** variables that the students should have controlled to make their results comparable.

1 .....

2 .....

3 .....
[3]

The students were then provided with a glucose solution **X** of unknown concentration which they tested with Benedict's solution. The result was a yellowish-orange colour.

(d) **(i)** Use Table 1.1 to suggest what the students may have concluded about the % concentration of glucose in solution **X**.

.....

.....[1]

(ii) Suggest how the students could determine a more accurate % concentration for glucose solution **X**.

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.....[2]

(e) 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]

(f) After the students had tested the glucose solutions in Table 1.1 with Benedict's solution, they noticed that a solid (precipitate) had collected at the bottom of the test-tubes.

They decided that finding the mass of the solid was another way of measuring the concentration of glucose in the solution.

Suggest how the students could separate this solid from the solution and obtain its mass.

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.....

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.....[2]

[Total: 16]

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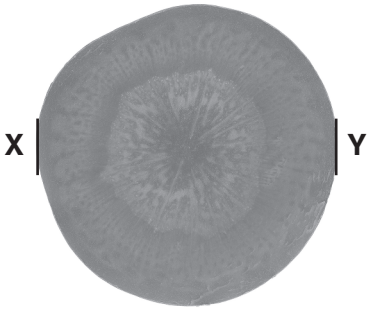
2 Fig 2.1 shows a section through the root of a carrot plant.



magnification ×1

Fig. 2.1

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

[4]

(ii) On Fig. 2.1 draw a straight line between **X** and **Y.** Measure your line and record the length.

..... mm

On your drawing, draw a line in a similar position to the one drawn on Fig. 2.1.
Measure this line on your drawing and record it.

..... mm

Calculate the magnification of your drawing compared with the section shown in Fig. 2.1.
Show your working.

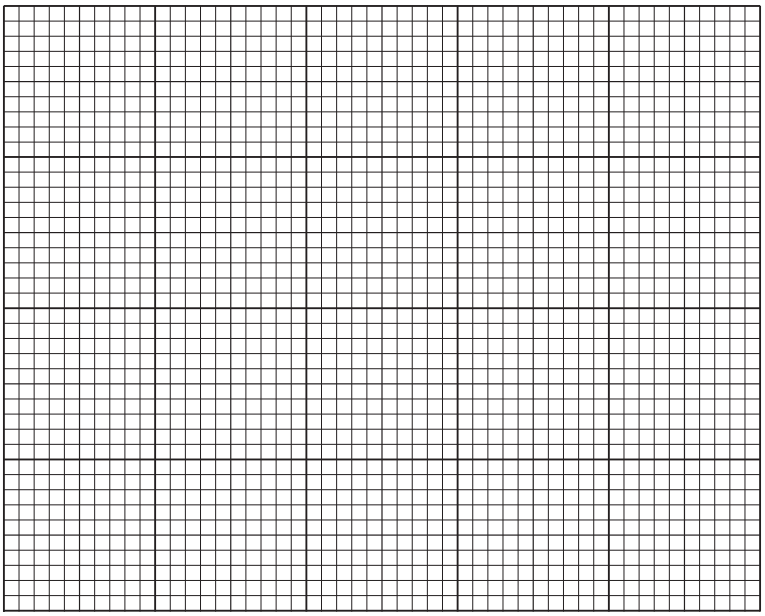
magnification × .....
[4]

(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 .....

.....

2 .....

.....

[2]

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(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.

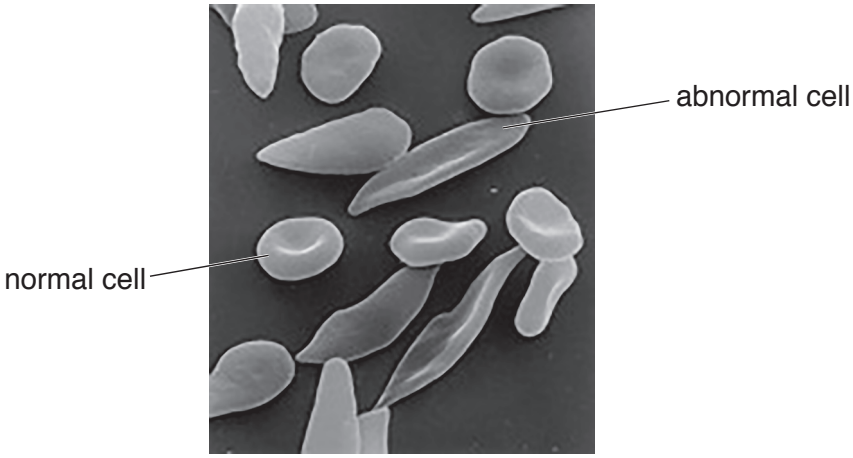

Fig. 3.1

(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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.....

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.....[2]

[Total: 6]

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