Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

5830694749

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **May/June 2014**

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.
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 **10** printed pages and **2** blank pages.

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1 Some students wanted to find the effect of sugar solution on onions.

They cut slices of onion 2 mm thick from a whole onion as shown in Fig. 1.1A. One ring was separated and cut into two equal pieces as shown in Fig. 1.1B.

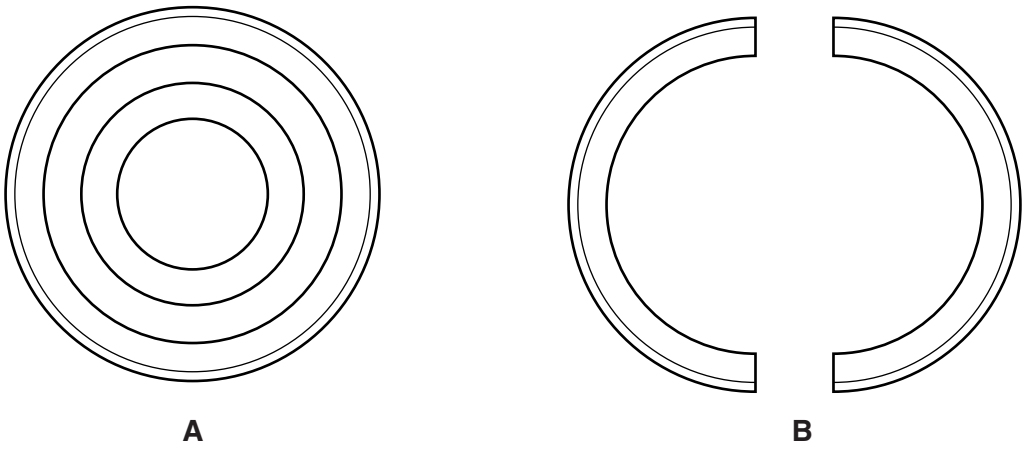
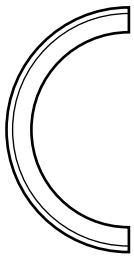
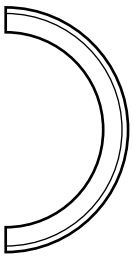
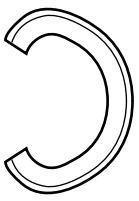


Fig. 1.1

One half of this onion ring was immersed in distilled water in a dish and the other half in a sugar solution in another dish.
The shape of these two pieces at the start was recorded in Table 1.1.

The dishes were left for 30 minutes under the same conditions and then the piece of onion ring in each dish was observed and its shape drawn in Table 1.1.

Table 1.1

	shape of the piece of onion ring	
	in distilled water	in sugar solution
at the start		
after 30 minutes		

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(a) (i) Describe the changes that are visible in the two pieces of onion after 30 minutes.

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..... [3]

(ii) Explain what has happened to cause the changes in the two pieces of onion.

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..... [5]

(b) (i) State **one** factor that was kept the same in this investigation and explain why it was kept the same.

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..... [2]

(ii) Some students decided to find out the effect of using a range of different concentrations of sugar solution on pieces of onion.

Describe **two** other factors that would need to be controlled.

1 .....

2 .....

[2]

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[Turn over

(iii) Explain how you could **measure** the effect of using a range of different concentrations.

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..... [1]

(c) In one of the sugar concentrations the shape of the onion remained unchanged.

Suggest an explanation for this.

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..... [2]

[Total: 15]

Turn over for Question 2

2 Fig. 2.1 shows a section through an apple.



Fig. 2.1

(a) (i) Make a drawing to show this cut surface of this apple. Your drawing should be the same size as Fig. 2.1. Label the seeds and the remains of the sepals.

[4]

(ii) Draw a line on Fig. 2.1 and measure the **part of the apple** between **X** and **X**. Record your measurement and units.

..... [1]

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Fig. 2.2 shows an apple that is not suitable for eating.



Fig. 2.2

(iii) Draw a line on Fig. 2.2, in a similar position to the one you have marked on Fig. 2.1.
Measure the length of this line and record below.

.....

Calculate the number of times larger the apple in Fig. 2.1 is compared with the apple shown in Fig. 2.2.
Show your working.

number of times larger ..... [4]

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[Turn over

(b) As apples ripen changes occur in them to make the apple less acidic and sweeter to taste.

Describe how you could test a sample of an apple to show whether the sweetness is due to reducing sugar.

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..... [4]

(c) Eating apples are traditionally stored in cool, dark conditions to preserve them.

Some students compared two samples of eating apples that were stored under the same conditions.

Some apples were wrapped in paper and other apples were left unwrapped.

The students measured the total mass of each sample of apples over 10 days of storage.

Their measurements are recorded in Table 2.1.

Table 2.1

storage time/days	mass of sample of apples/g	
	wrapped in paper	unwrapped
0	505	500
2	495	480
5	475	455
7	460	435
10	455	420

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(i) Complete Table 2.2, to show the loss in mass, compared to the starting mass, for the sample of unwrapped apples.

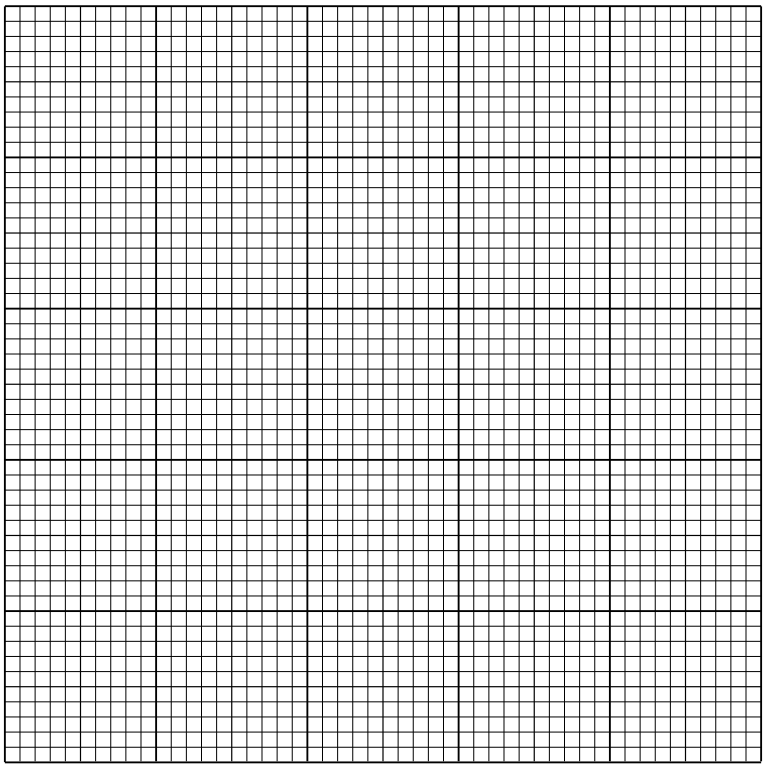
Table 2.2

storage time / days	loss in mass of sample of apples / g	
	wrapped in paper	unwrapped
0	0	0
2	10	
5	30	
7	45	
10	50	

[2]

(ii) Construct a graph of the data in Table 2.2 to show the loss of mass of the wrapped apples and unwrapped apples.

Use the same axes for plotting both sets of data.



[5]

(iii) Using your graph, calculate the difference in loss in mass between the unwrapped and wrapped apples after **8 days** of storage.

[3]

(iv) Suggest **two** processes by which the apples lost mass.

.....

..... [2]

[Total: 25]

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Fig. 2.1 DR KEITH WHEELER/SCIENCE PHOTO LIBRARY

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