



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

CANDIDATE  
NAME

CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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**BIOLOGY**

**5090/31**

Paper 3 Practical Test

**May/June 2011**

**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 ink.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use red ink, staples, paper clips, highlighters, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

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	
<b>Total</b>	

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



Read through the whole question before starting.

Do not taste the fruit sections provided.

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- 1 (a) (i) Describe how you would carry out a test for reducing sugars using Benedict's solution and the results you would expect if reducing sugars were present.

.....  
 .....  
 .....  
 ..... [3]

You are provided with a solution labelled **S1**.

- (ii) Carry out the test you have described on a sample of **S1** and record what you conclude about the solution.

..... [1]

You are provided with some potato tissue covered in polythene.

- Remove the polythene.
- Cut the potato tissue into small pieces and place these in a clean test-tube.
- Add some distilled water and shake the test-tube.

- (iii) Carry out the test you described in (a)(i) on this mixture.  
 State your result and conclusion.

*result* .....

*conclusion* ..... [1]

You are provided with three dishes, each containing a similar piece of potato and a solution. Each potato strip was cut exactly 5.0 cm in length before being placed in the solution at least an hour before the start of the examination.

- Dish **A** – contains **S1** solution.  
 Dish **B** – contains half **S1** and half distilled water.  
 Dish **C** – contains distilled water.

- Remove the potato strip from dish **A**.
- Blot the strip carefully on a paper towel.

- (b) (i) Accurately measure the longest length of this potato strip and record the length in Table 1.1.
- Repeat the procedure with the potato strips in dishes **B** and **C** and record their lengths in Table 1.1.
- (ii) Calculate the change in length between the initial and your measured length and complete Table 1.1.

**Table 1.1**

	length of potato strip / cm		
	<b>A</b>	<b>B</b>	<b>C</b>
initial length	5.0	5.0	5.0
measured length			
change in length			

[2]

- (iii) Describe and explain the changes in length.

.....

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..... [4]

[Total: 11]

2 The blue dye, DCPIP (dichlorophenolindolphenol) will lose its colour when vitamin C solution is added to it.

(a) (i) You are provided with a standard solution of vitamin C. You will need to determine the volume of this needed for the blue colour to disappear in a known volume of the blue dye.

- Put 10 cm<sup>3</sup> of blue dye into a clean test-tube.
- Fill a clean syringe with the standard vitamin C solution and record this initial volume in Table 2.1.
- Keep the end of the syringe near to the surface of the blue dye in the test-tube and take care not to shake the test-tube. Add the standard vitamin C solution **drop by drop** until the colour of the blue dye disappears.
- Record in Table 2.1 the volume of the standard vitamin C solution remaining in the syringe as the final volume.
- Repeat the procedure twice more.

**Table 2.1**

	volume of vitamin C solution / cm <sup>3</sup>		
	1 <sup>st</sup> reading	2 <sup>nd</sup> reading	3 <sup>rd</sup> reading
initial volume			
final volume			
volume used to make the blue colour disappear.			

[3]

(ii) Subtract the final volumes from the initial volumes to calculate the volume of standard vitamin C solution needed to make the blue colour of the dye disappear, then complete Table 2.1. [1]

(iii) Explain why readings were taken three times.

.....  
 ..... [1]

(iv) Calculate the mean volume of standard vitamin C solution needed to make the blue colour of the blue dye disappear.

..... [1]

You will now test the fruit juice, **S2** to compare its vitamin C content within the standard vitamin C.

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- (b) (i) Repeat the procedure in (a)(i) with **S2** instead of the standard vitamin C solution. Record your results in Table 2.2.

**Table 2.2**

	volume of <b>S2</b> /cm <sup>3</sup>		
	1 <sup>st</sup> reading	2 <sup>nd</sup> reading	3 <sup>rd</sup> reading
initial volume			
final volume			
volume of <b>S2</b> used to make the blue colour disappear			

[3]

- (ii) Subtract the final volumes from the initial volumes to calculate the volume of fruit juice **S2** needed to make the blue colour of the dye disappear, then complete Table 2.2. [1]
- (iii) Calculate the mean volume of fruit juice, **S2** needed to make the blue colour of the dye disappear.

..... [1]

- (iv) State which solution, the standard vitamin C solution or the fruit juice **S2** has the higher vitamin C content.

..... [1]

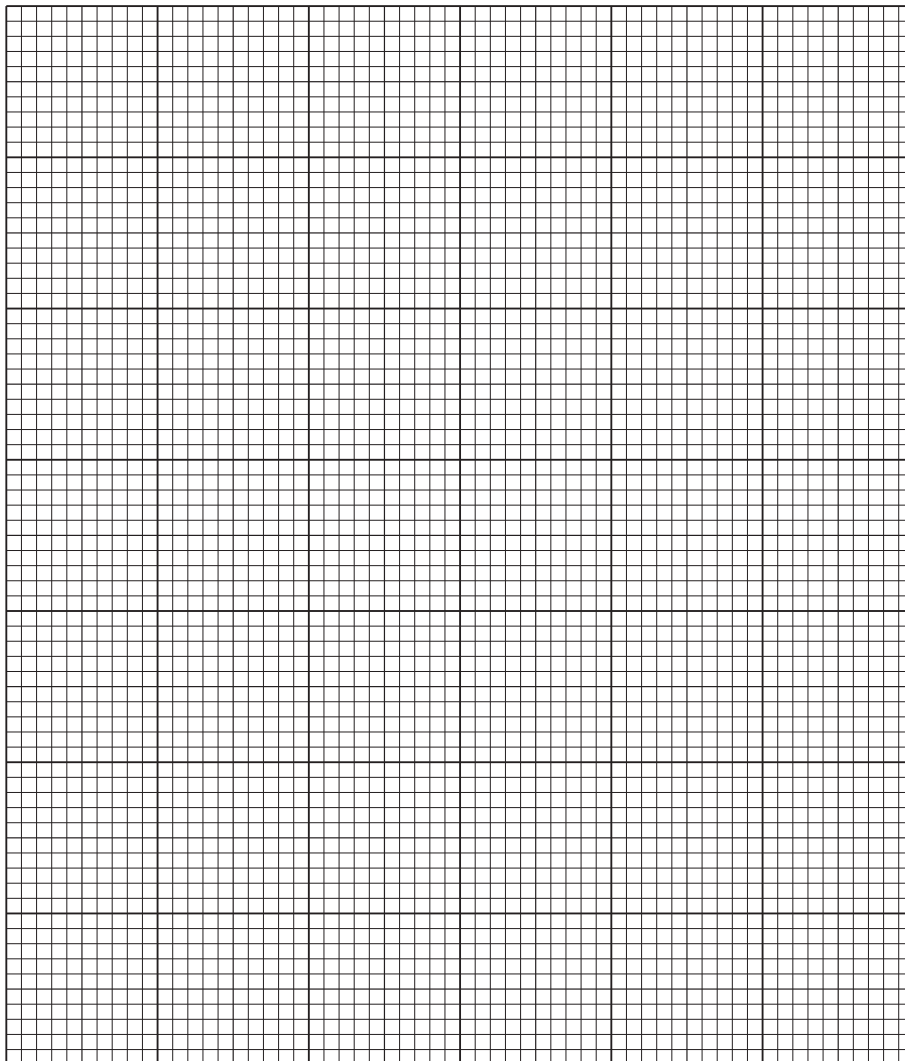
Some students investigated the vitamin C content of 100 g of each of six different fruits. Their results are shown in Table 2.3.

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**Table 2.3**

fruit	kakadu plum	camu camu	gojiberry	blackcurrant	kiwifruit	orange
vitamin C/mg per 100g	3100	2800	2500	200	90	50

(c) (i) Draw a bar chart of the vitamin C content of the fruits in Table 2.3.



[4]

- (ii) Calculate how many times greater the vitamin C content of 100g of kakadu plum is than that of 100g of an orange. Show your working.

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..... [1]

**Fresh** fruit and vegetables contain the highest levels of vitamin C.

- (d) Describe how you would investigate how the length of time oranges are stored affects their vitamin C content.

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.....  
..... [5]

- (e) Explain why humans need vitamin C in their diet.

.....  
..... [1]

[Total: 23]

3 **S3** is a preserved specimen of an adult insect.

(a) (i) Make a large drawing of one back leg of this insect.

[4]

(ii) Calculate the ratio of the length of one front leg to the length of one back leg on specimen **S3**.

*length of front leg* .....

*length of back leg* .....

*ratio* .....

[2]

[Total: 6]

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