



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**

**5090/03**

Paper 3 Practical Test

**October/November 2007**

**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 a pencil for any diagrams, graphs or rough working.

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

DO **NOT** WRITE IN ANY BARCODES.

Answer **both** 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.

Do **not** write in the grey areas between the pages.

For Examiner's Use	
<b>1</b>	
<b>2</b>	
<b>Total</b>	

This document consists of **6** printed pages and **2** blank pages.



1 You are provided with three maize seedlings.

- select one of the seedlings that shows clearly the remains of the grain and the parts growing from it.

(a) (i) Make a large, labelled drawing to show the structure of the seedling.

[5]

(ii) Measure a suitable part of both specimen and drawing, and calculate the magnification of your drawing. Indicate on your drawing where the measurement was taken.

size of part of drawing = .....

size of part of specimen = .....

show your working clearly.

magnification = ..... [3]

(b) Read carefully all the instructions before starting this section.

- cut off all parts that have grown from the three grains,
- chop the remains of the grains as finely as possibly on the tile,
- approximately half fill one of the large test-tubes with water,
- place starch solution in the Visking tubing up to a depth of approximately 4 cm using the pipette or syringe provided. You may find it helpful to stand the Visking tubing in the empty large test-tube to support it whilst filling it,
- add the chopped grains to the starch solution in the Visking tubing,
- using the funnel and thin rod, or folded card, to help you, rinse the white tile so that it is clean for later use,
- gently rinse the lower part of the Visking tubing under the tap to clean it,
- transfer the Visking tubing into the large test-tube containing water. Use the clip or peg to attach the Visking tubing to the top of the large test-tube so that the contents of the tubing are below the water level,
- place a drop of the water from the large test-tube on a clean white tile and test it for the presence of starch,
- test another sample of the water from the large test-tube for reducing sugar. Do not throw this away until after you have completed (c).

(i) State the results of the test for

starch, .....

reducing sugar. .... [2]

(ii) Describe how you carried out the test for reducing sugar.

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

**Leave the experiment for about 30 minutes before carrying out (c).**

**Begin question 2 while you wait.**

(c) Repeat the same two tests on the water in the test-tube.

State the results of the test for

starch, .....

reducing sugar. .... [2]

(d) Explain what has happened in the apparatus during this experiment to produce these results.

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

(e) Describe a plan for a similar experiment to allow you to make a valid comparison between maize seedlings and rice seedlings. Give full practical details.

.....  
.....  
.....  
.....  
.....  
..... [4]

[Total : 22]

- 2
- measure the length of the leaf, specimen **W1**. (Do **not** include the petiole),
  - measure the width across the leaf at its widest part.

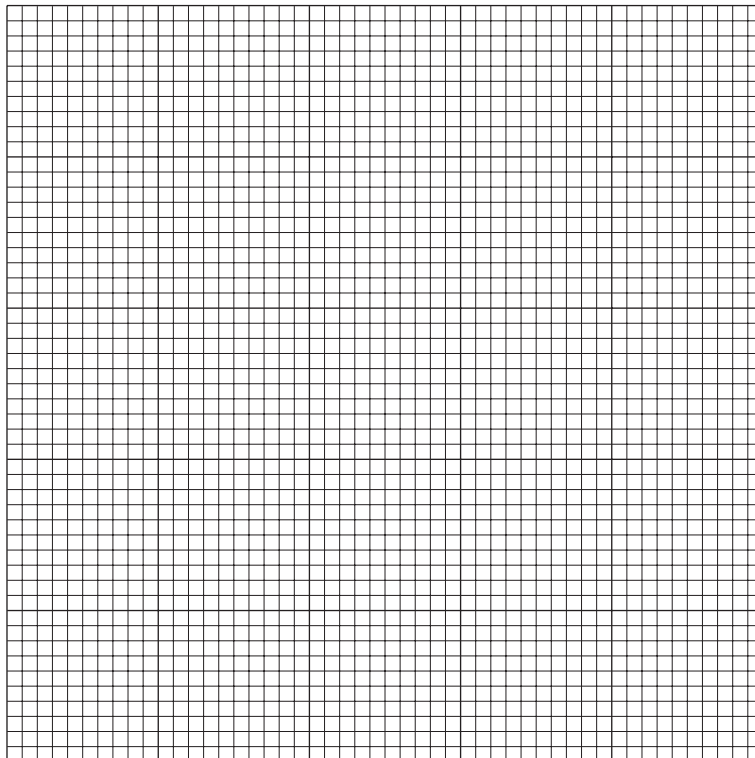
length = ..... width = .....

- (a) (i) Estimate the surface area on one side of the leaf by multiplying its length by its width and dividing the product by two.

Showing your working and your answer clearly.

[3]

- Place the leaf on the grid below and, with a pencil, trace its outline.
- (ii) Calculate the surface area of the leaf by counting the squares.



Show your working and your answer clearly.

surface area = ..... [4]

(iii) Suggest one advantage and one disadvantage of the method of estimating in (a) (i).

advantage .....

disadvantage ..... [2]

(b) (i) State what further information is required in order to determine the volume of the leaf.

..... [1]

(ii) Suggest and explain some advantages of leaves having a large surface area to volume ratio.

.....

.....

..... [2]

(c) Compare specimen **W1** with specimen **W2**

(i) by listing three visible features that are the same in both specimens

1. ....

2. ....

3. .... [3]

(ii) by completing Table 2.1 with three pairs of contrasting features that are visible in the two specimens.

**Table 2.1**

	specimen <b>W1</b>	specimen <b>W2</b>

[3]

[Total : 18]

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