

Centre Number	Candidate Number	Name
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CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**BIOLOGY**

**5090/03**

Paper 3 Practical Test

October/November 2003

**1 hour 15 minutes**

Candidates answer on the Question Paper.

Additional Materials:

As listed in Instructions to Supervisors

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces provided at the top of this page.  
Write in dark blue or black pen in the spaces provided on the Question Paper.  
You may use a soft pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **both** questions.

The number of marks is given in brackets [ ] at the end of each question or part question.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

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

This document consists of **7** printed pages and a Supervisor's Report.



1 You are provided with specimen **W1**, which is a developing fruit.

(a) (i) In the space below, make a large, labelled drawing to show the external features of **W1**.

[6]

- Using a scalpel, slit along one edge of **W1**. Work carefully to ensure that you can see the seeds without cutting into them.
- Lift up the flap of tissue and turn it back so you can clearly see the seeds.

(ii) Add the outline of the seeds to your drawing above. [2]

(iii) In the space below, make a large, labelled drawing of a group of **three** adjacent seeds, showing their attachment to the fruit.

[3]

(iv) Calculate the magnification of your drawing of the seeds in (iii). Record appropriate measurements and your working clearly.

magnification .....[3]

(b) • Use a dropper or a glass rod to place some iodine solution on part of the inner surface of the fruit, close to the seeds. Do **not** cover the whole surface but leave some without iodine solution for comparison.

• Observe the effect of the stain for 3 to 5 minutes.

(i) Describe and explain any changes you have observed.

.....  
.....  
.....[2]

(ii) Suggest how you could have treated **W1** before the addition of the iodine solution in order for the changes to be seen more clearly. Give practical details of your suggested procedure.

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

[Total : 20]

2 (a) You are provided with a leaf, **W2**.

(i) Estimate the area of one surface of the leaf by using the following method.

- Measure the length of the leaf.
- Measure the width of the leaf at its widest part.
- Multiply these two figures.
- Calculate 75% of this value to give the surface area.

*length* = .....      *width* = .....

*calculation:*

*estimated surface area of leaf* = .....

[3]

Check the accuracy of your estimate by using the following method.

- Place **W2** on the grid opposite.
- Carefully draw round the edge of the leaf with a pencil.
- Remove the leaf and count the number of squares that the leaf covered.
- Make allowance for the fact that some squares are only partially covered by the leaf.


**(ii)** Record your results and explain how you tried to ensure the accuracy of your count.

*to ensure accuracy* .....

.....

.....

*surface area of leaf =* .....

[4]

(iii) State how you made allowance for the fact that some squares were only partially covered by the leaf.

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

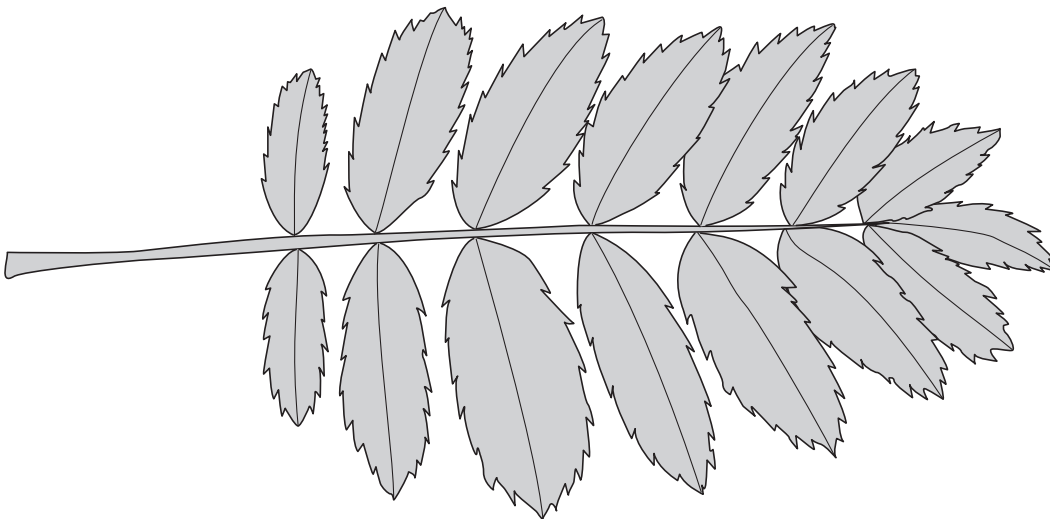
(iv) Suggest another way in which this allowance could have been made.

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

(v) What conclusion can be drawn regarding the accuracy of your estimate in (i)?

.....  
.....  
.....[2]

(b) Fig. 2.1 shows the lower surface of another leaf that has a more complicated shape, consisting of a number of leaflets.



**Fig. 2.1**

Make an estimate of the surface area of this leaf, showing your method, stage by stage.

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

- (c) • Ask your Supervisor for some hot water.
- Pick up **W3** with the forceps and hold it below the surface of the hot water provided, observing the leaf surfaces as you do so.

(i) State what you observed when the leaf was held in the hot water.

.....  
.....[2]

(ii) Explain what you observed, referring to the internal structure of a leaf.

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

[Total : 20]

## SUPERVISOR'S REPORT

*\*The Supervisor or Teacher responsible for the subject is asked to answer the following questions.*

- 1 Was any difficulty experienced in providing the necessary materials? If so, give brief details. State the type of legume pod provided. If mangetout pea has not been provided, the supervisor must complete question 1(a)(i) to (iii) on an unused script, and return this in the envelope with the candidate's scripts.
  
- 2 Did the candidate experience any difficulty during the course of the examination? If so, give brief details. Reference should be made to
  - (a) difficulties arising from faulty specimens;
  - (b) accidents to apparatus or materials;
  - (c) any information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

*Declaration (to be signed by the Principal, and completed on the top script from the Centre)*

The preparation of the practical examination has been carried out so as to fully maintain the security of the examination.

Signed .....

Name (in block capitals) .....

**\*Information that applies to all candidates need only be given once.**

N.B. If scripts are required by CIE to be despatched in more than one envelope, it is essential that a copy of the relevant Supervisor's Results (when requested), the Supervisor's Report and the appropriate seating plan are sent inside **each envelope**.