UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/62**

Paper 6 Alternative to Practical **October/November 2010**

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 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.
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	
Total	

This document consists of **7** printed pages and **1** blank page.

© UCLES 2010

1 Fig. 1.1 shows the apparatus used in an investigation for measuring the rate of water uptake as a way of comparing transpiration rates.

For Examiner's Use

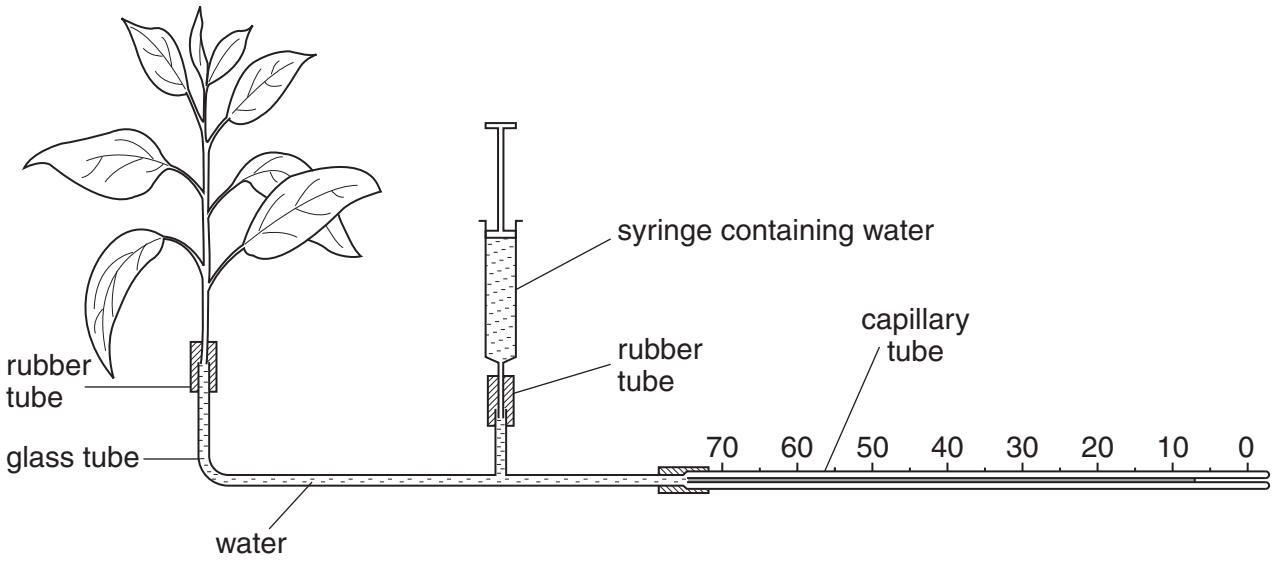


Fig. 1.1

- The plant is attached to the glass tube by a short piece of rubber tube.
- This is carried out under water so that no air can enter the base of the plant.
- As the plant absorbs water it draws more water along the capillary tube.
- It is noted how far along the scale the water moves in two minutes.
- Water can be added from the syringe to refill the capillary tube.
- This is recorded in Table 1.1.
- Readings were taken at intervals of two hours, as shown in Table 1.1.

Table 1.1

time of day reading taken	distance moved in two minutes / arbitrary units
0800	7
1000	12
1200	26
1400	29
1600	42
1800	30
2000	

© UCLES 2010

(a) (i) Complete Table 1.1 by reading the scale in Fig. 1.1. [1]

For Examiner's Use

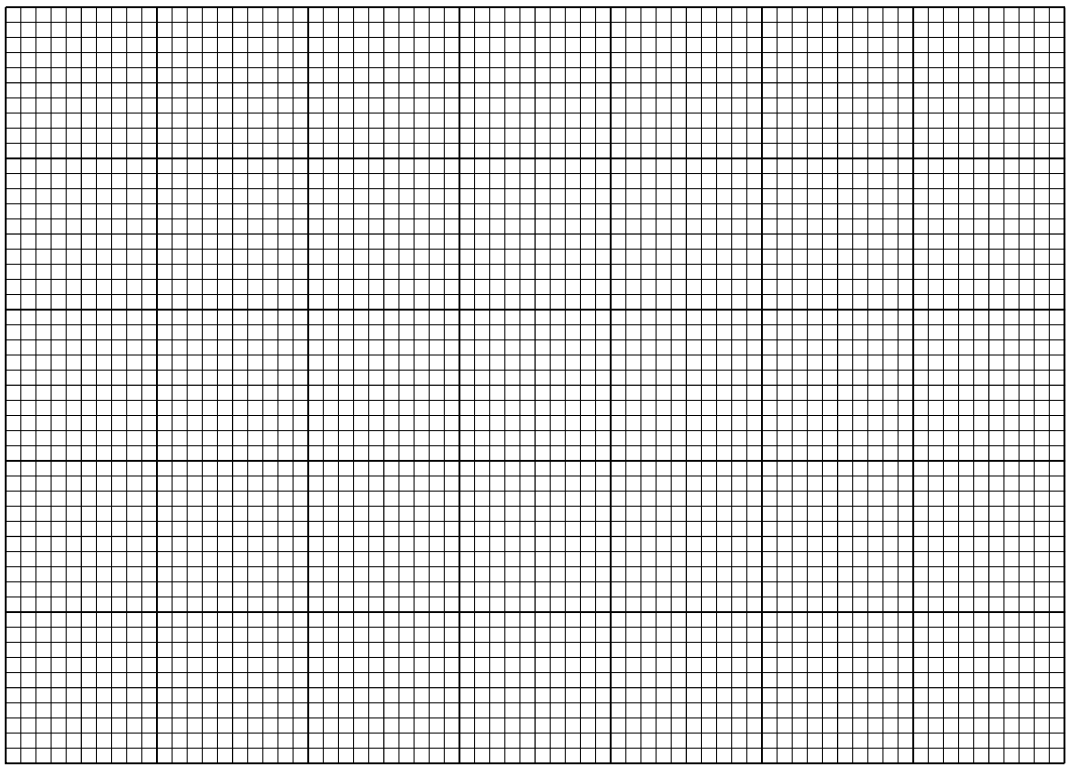
(ii) State how the scale could be set to zero before another reading was taken.

.....

.....

.....[2]

(iii) Construct a graph from the figures in Table 1.1.



[4]

(iv) Suggest three named environmental conditions that might account for the shape of the curve.

1. .....

.....

2. .....

.....

3. .....

.....[3]

For Examiner's Use

(v) Suggest a possible reason for the reading at 1400 hours being lower than might have been expected.

.....

.....[1]

Fig.1.2 represents a section through a leaf.

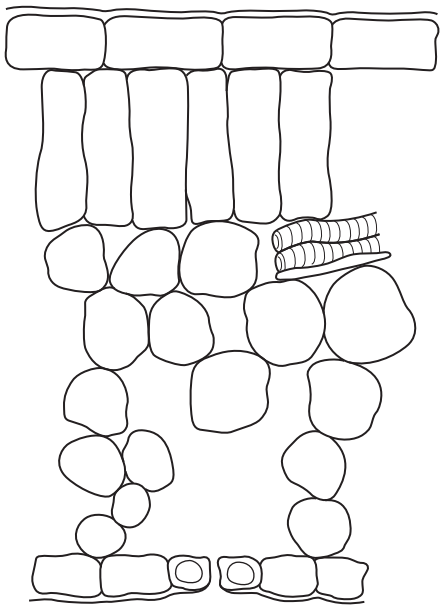


Fig. 1.2.

(b) Draw arrows and labels on Fig. 1.2 to show:

(i) a pathway by which water moves through the leaf and is lost to the atmosphere. Identify, using appropriate labels, the physical processes that are involved. [4]

(ii) the route taken by carbon dioxide that is being used in photosynthesis. [2]

(iii) Label the leaf cells that are important in these processes. [3]

[Total: 20]

© UCLES 2010

2 Fig. 2.1 shows the inside of a seed.

For Examiner's Use

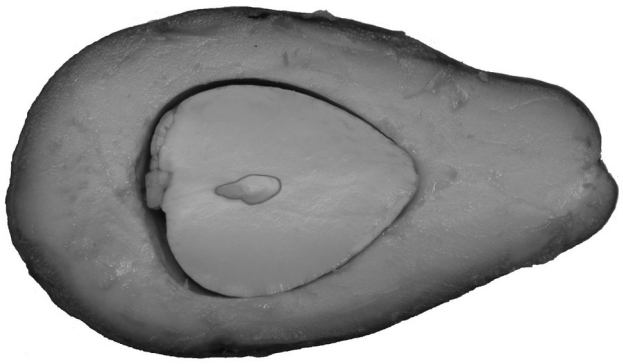


Fig. 2.1 ×0.75

(a) (i) Make a large, labelled drawing of those parts of the seed that will develop into the stem and root as the seed germinates. Indicate which part becomes the stem and which becomes the root.

[5]

(ii) Calculate the magnification of your drawing compared with the actual size of the specimen from which Fig. 2.1 was taken. Show all working clearly.

total length of drawing .....

equivalent length of specimen .....

magnification = ... [4]

[Total: 9]

3 Fig. 3.1 shows the apparatus set up at the beginning of an investigation into the effect of animals and plants on the carbon dioxide concentration in water.

For Examiner's Use

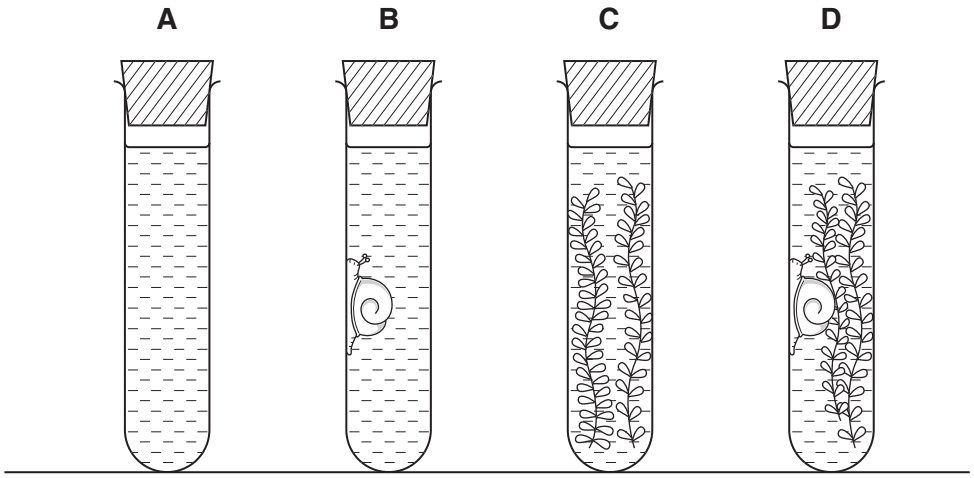


Fig. 3.1

Hydrogen carbonate indicator (bicarbonate indicator) reacts to pH by changing colour.

- In neutral conditions it is red.
- In alkaline conditions it is purple.
- In acidic conditions it is yellow.

The dilute indicator is not harmful to living organisms such as water snails and pond weed that are used in this investigation.

The contents and appearance of each container are listed in Table 3.1.

Table 3.1

	container **A**	container **B**	container **C**	container **D**
contents of container	indicator only	snail and indicator	pond weed and indicator	snail, pondweed and indicator
colour of indicator when set up	red	red	red	red

The apparatus was left in bright light for two hours. The colour of the indicator in each container was then observed.

© UCLES 2010

For Examiner's Use

(a) (i) Complete Table 3.2 to suggest the colour of the indicator in each container, after two hours in bright light.

Table 3.2

	container **A**	container **B**	container **C**	container **D**
contents of container	indicator only	snail and indicator	pond weed and indicator	snail, pondweed and indicator
colour in each container after two hours				

[4]

(ii) Name the two processes that are responsible for these colour changes.

1. .....

2. .....[2]

(iii) Explain how these processes cause the colour changes.

.....

.....

.....

.....[3]

(iv) If container **C** was covered with light-proof foil for the whole of the investigation, suggest and explain how the results might be different from that suggested in Table 3.2.

.....

.....

.....

.....[2]

[Total: 11]

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2010