Centre Number	Candidate Number	Name

CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

BIOLOGY **0610/06**

Paper 6 Alternative to practical

October/November 2003

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 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 **all** 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	
3	
TOTAL	

This document consists of **9** printed pages and **3** blank pages.

UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate
[Turn over

1 Warm-blooded animals need to maintain a constant internal temperature.

In cold weather some of these animals crowd closely together in a group.

To investigate the advantages of crowding together in such a group a student followed the drop in temperature of 10 cm^3 of water in a test tube.

- Test tube **A** was used to represent a single animal as shown in Fig. 1.1
- Test tubes **B** and **C** were used to represent part of a crowded group of animals using 7 tubes as shown in Fig. 1.2.

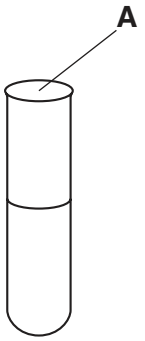


Fig. 1.1

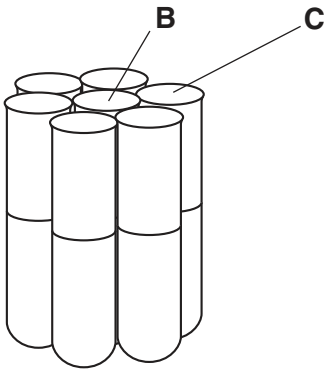


Fig. 1.2

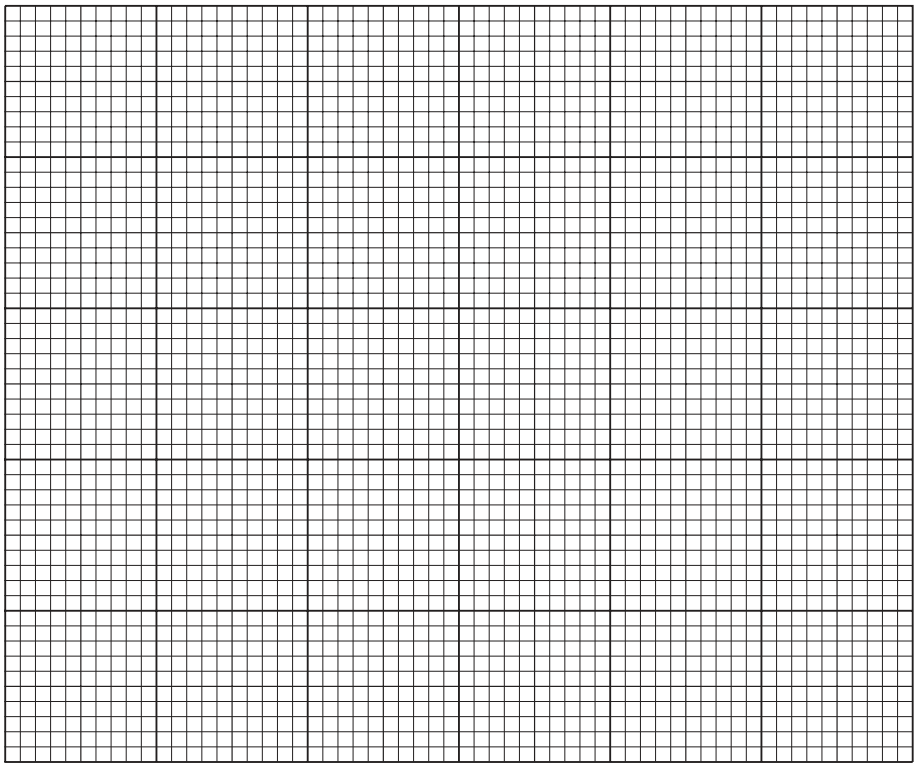
The temperature of the tubes labelled **A**, **B** and **C** in Fig. 1.1 and Fig. 1.2 was measured using a thermometer, every 2 minutes for 10 minutes.

The results are shown in Table 1.1.

Table 1.1

	temperature of water in test-tubes / °C		
time / minutes	A (single test-tube)	B (tube at centre of group)	C (tube at edge of group)
0	55	55	55
2	44	54	52
4	41	54	50
6	39	53	49
8	37	52	47
10	36	52	46

(a) (i) Plot a graph of the results to show clearly the difference between the three sets of data.



[7]

(ii) Describe the results for tube **A**.

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.....[2]

(iii) Describe the differences between the results for tube **A** and those for tubes **B** and **C**.

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.....[2]

(iv) Explain how the results shown in the graph show the effect of crowding together of animals in cold conditions.

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[Turn over

(b) Suggest **two** ways in which this investigation could have been improved to make the results more reliable.

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.....[2]

[Total : 15]

2 (a) (i) Fig. 2.1 shows a ground-living beetle.

Make a large drawing of the whole animal shown in Fig. 2.1. Label **three** features that enable you to classify this animal as an insect.

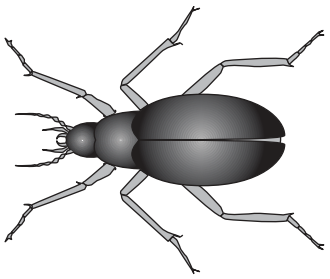

Fig. 2.1

[5]

(ii) Measure the length of the insect in Fig. 2.1 and the length of your drawing. Calculate the magnification of your drawing.

Length of insect in Fig. 2.1 .....

Length of drawing .....

Magnification .....[3]

(b) One method of estimating the population of insects, such as the ground-living beetle, is to use a pit-fall trap. A suitable container, such as an empty food tin, is set into the ground so the top is level with the surface of the soil, as shown in Fig. 2.2.

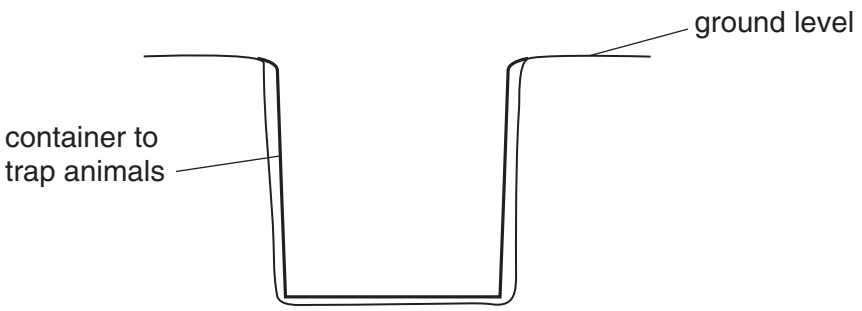

Fig. 2.2

Suggest and explain briefly two precautions that you might take when investigating populations of insects, such as ground-living beetles, using pit-falls traps.

1. .....

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2. .....

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(c) Fig. 2.3 shows another insect.

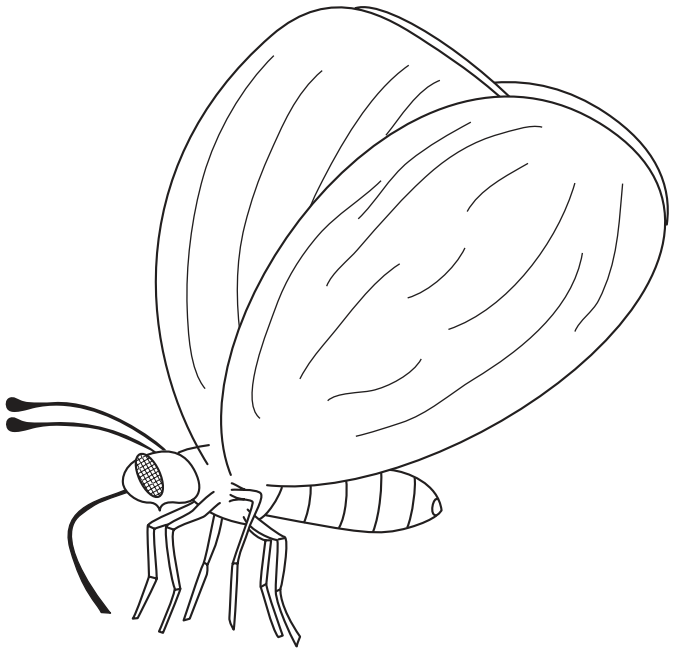

Fig. 2.3

Describe three visible differences in the structure of the insect in Fig. 2.3 from the insect in Fig. 2.1.

1. .....

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2. .....

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3. .....

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[Total : 15]

3 Water is lost from the aerial parts of plants by transpiration.

(a) Outline how you could show that water is lost from plant shoots.

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Fig. 3.1 shows a simple apparatus to investigate the rate of transpiration by recording the mass of a potted plant over a period of time.

Fig. 3.2 shows the results over a number of hours.

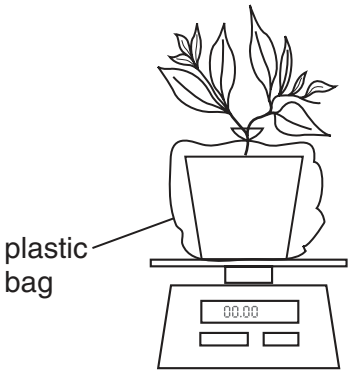

Fig. 3.1

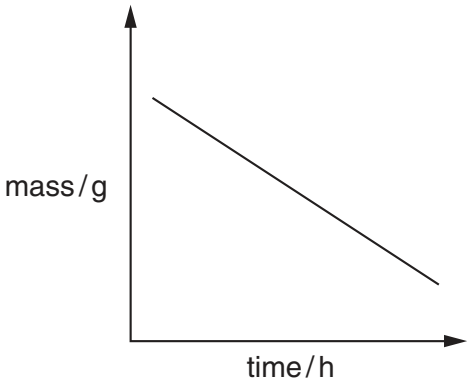

Fig. 3.2

(b) Suggest why the pot is enclosed in a plastic bag.

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.....[1]

(c) Describe how, using similar apparatus to that in Fig. 3.1, you could compare the transpiration rates of two different plants.

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(d) Certain plants, such as that in Fig.3.3, are able to live in dry regions of the world.

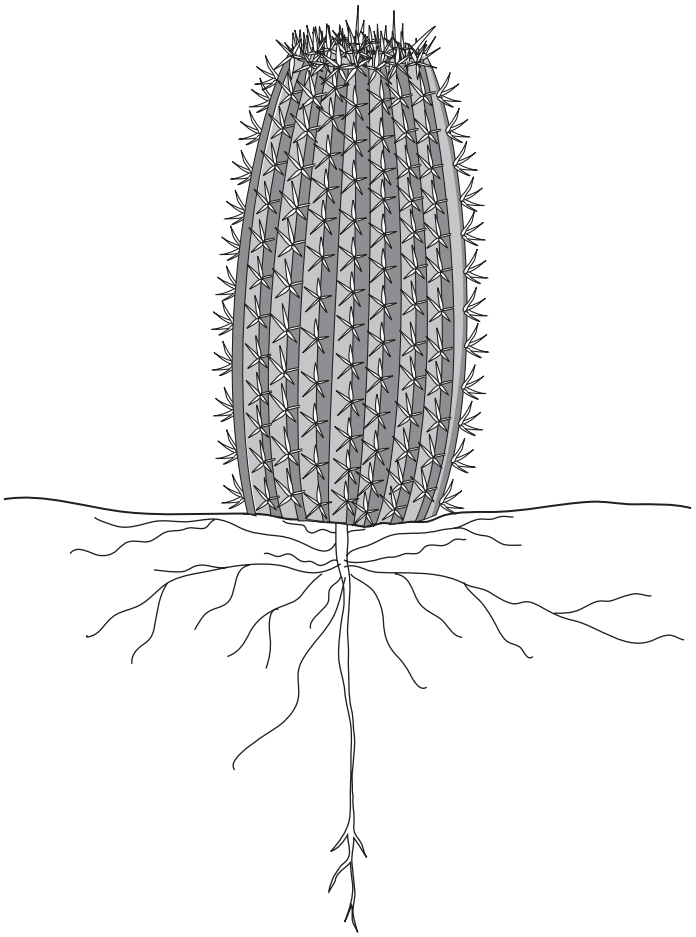

Fig. 3.3

Suggest three ways in which this plant is adapted to grow in these dry regions.

1. .....

2. .....

3. .....[3]

[Total : 10]

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