UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

0275068562

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **May/June 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 **10** printed pages and **2** blank pages.

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1 Fruits of banana, *Musa spp*, change as they ripen.



A **B**

Fig. 1.1

(a) Describe the differences that you can see between the unripe banana fruit **A**, and the ripe fruit **B**, shown in Fig. 1.1.

.....

.....

.....

.....[2]

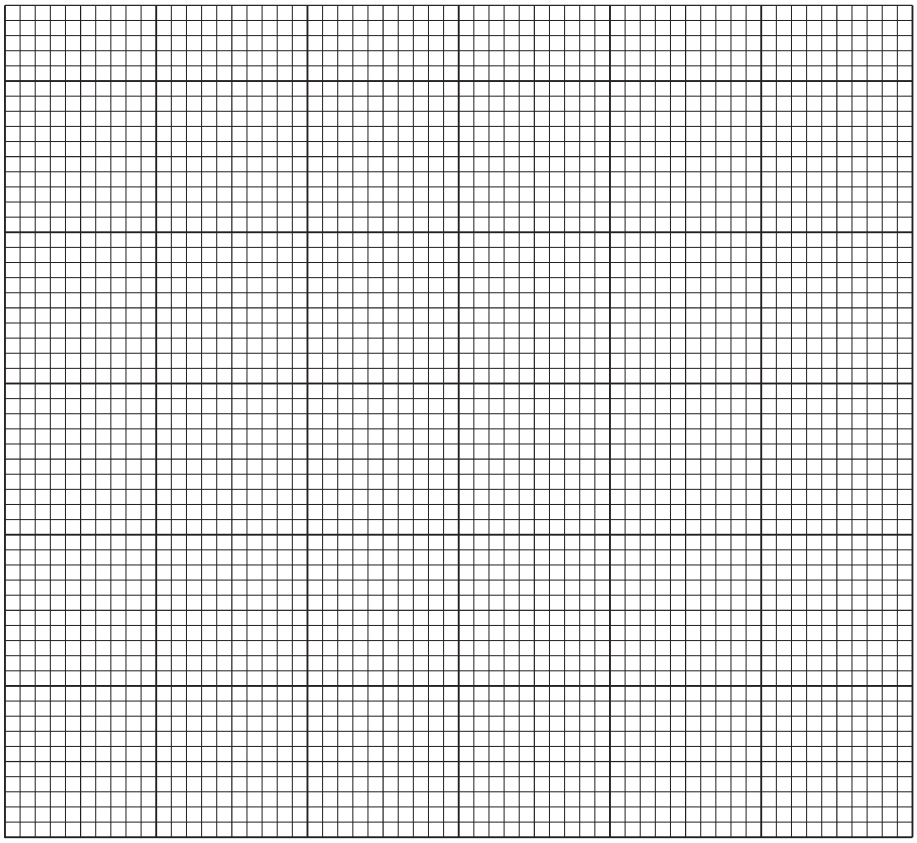
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Table 1.1 shows the mass of a banana fruit measured over a period of three weeks.

Table 1.1

day	mass / g
1	152
4	146
6	140
7	138
10	126
12	122
15	114
18	108
21	98

(b) (i) Construct a graph of these results on the grid provided.



[4]

(ii) Calculate the loss in mass of the banana fruit during the three weeks.

.....[1]

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(iii) Suggest an explanation for the loss in mass during the ripening of the fruit.

.....

.....

.....

.....[2]

One of the changes that takes place as a banana fruit ripens is the breakdown of starch to sugar.

(c) (i) Describe how you could carry out a test for reducing sugar on a piece of banana fruit.

.....

.....

.....

.....

.....

.....

.....[4]

(ii) Explain how would you use this test to show that the reducing sugar content increases during ripening.

.....

.....

.....

.....

.....

.....

.....[4]

[Total: 17]

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Question 2 begins on page 6

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2 Fig. 2.1 is a photograph of a ground-living beetle.



Fig. 2.1

(a) Make a large labelled drawing of this beetle.

[5]

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(b) Measure and record:

the length of the beetle in Fig. 2.1 .....

the length of your drawing .....

Calculate the magnification of the beetle in your drawing. Show your working clearly.

magnification .....[4]

It is sometimes useful to know how many living organisms are present in a particular habitat, but impossible to catch and count them. One way of estimating how many ground-living beetles there are in a habitat is to use pitfall traps, similar to that shown in Fig. 2.2.

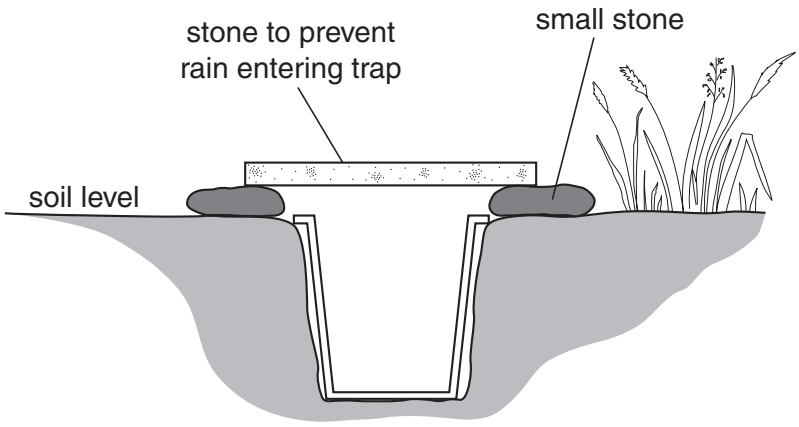


Fig. 2.2

A number of pitfall traps are placed in the area and left for a period of time.

The containers in the pitfall traps are collected, any beetles in them are counted and recorded **[A]**, marked and then released back into the same habitat.

The containers in the pitfall traps are replaced after a day and left for the same period of time as before.

Again the containers in the pitfall traps are collected and the number of beetles counted and recorded **[B]**.

The number of beetles with marks in this second group are counted and recorded **[C]**.

The formula $\frac{\mathbf{A \times B}}{\mathbf{C}}$ can then be used to give an estimate of the total number of beetles in the habitat.

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Table 2.1 shows the results of an investigation carried out like this in a particular area.

Table 2.1

A	B	C
12	10	2

(c) (i) Use the formula $\frac{\mathbf{A} \times \mathbf{B}}{\mathbf{C}}$ to estimate the total number of beetles in the habitat.

estimated number ..... [1]

(ii) Suggest why the use of pitfall traps might be an inaccurate way of estimating the number of ground-living beetles.

.....

.....[1]

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Some students used pitfall traps to estimate the number of ground-living beetles in two different habitats, an open grassland area and a shady wooded area.

They recorded the numbers of ground-living beetles caught in the traps each day for 5 days, returning the beetles to the same habitat each day. The results are shown in Table 2.2.

Table 2.2

day	the number of ground-living beetles caught in the pitfall traps	
	open grassland	shady woodland
1	12	16
2	6	15
3	8	10
4	14	22
5	10	17
total	.....	.....

(d) (i) Complete Table 2.2 by calculating the total number of ground-living beetles caught in each habitat. [1]

(ii) Suggest **two** reasons why there were more ground-living beetles found in the shady woodland area compared with the open grassland area.

.....

.....

.....

.....[2]

(iii) Suggest why the number of beetles varies from day to day.

.....

.....[1]

(iv) Ground-living beetles were the only species found in the traps. Suggest a possible reason for this.

.....

.....[1]

[Total: 16]

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3 Fig. 3.1 shows the four main bones in the forelimb of a mammal.

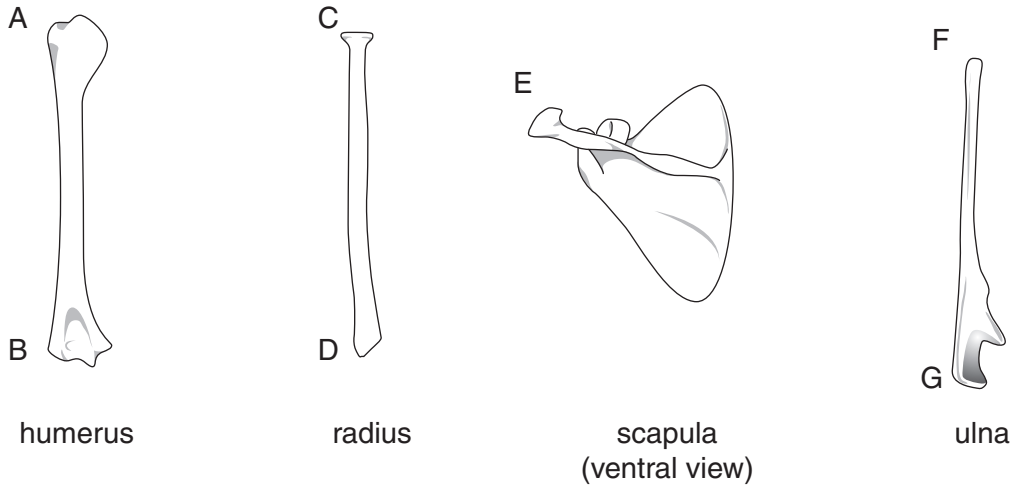


Fig. 3.1

(a) (i) Draw a diagram to show how these bones are arranged in the forearm of a mammal. Use the letters given in Fig. 3.1 in your diagram.

[3]

(ii) Draw on your diagram the structures that hold the bones in place. [1]

(b) (i) Name the structures that hold the bones in place.

.....[1]

(ii) Name the type of joint formed at the shoulder.

.....[1]

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(c) Bones are composed of living cells with mineral salts.

Name the mineral salt found in bones and give an example of a rich dietary source of this mineral.

mineral salt .....

dietary source ..... [1]

[Total: 7]

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Copyright Acknowledgements:

Question 2 Figure 2.1 © Black Ground Beetle (Pristonychus complanatus); The Natural History Museum/Alamy.

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