UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

6420242135

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **October/November 2013**

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.
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 **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.

Electronic calculators may be used.

This document consists of **10** printed pages and **2** blank pages.

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For Examiner's Use

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

In cold weather some of these animals crowd together in groups.

Some students used test-tubes containing hot water to represent animals in an investigation into the loss of heat from animals' bodies.

One test-tube, **A**, represented one animal on its own, as shown in Fig. 1.1.

Another test-tube, **B**, represented an animal surrounded by seven similar animals in a group, as shown in Fig. 1.2.

Test-tube **C** represented one of the outer animals in the group, as shown in Fig. 1.2.

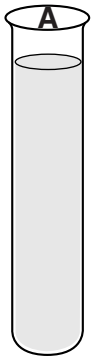


Fig. 1.1

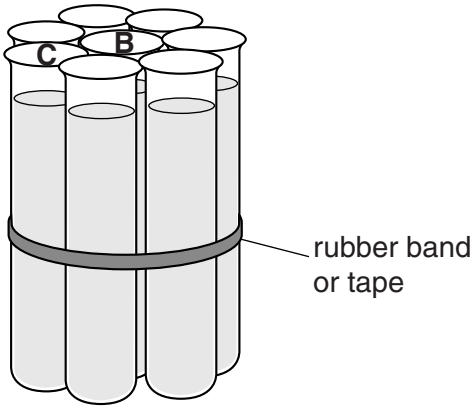


Fig. 1.2

All nine test-tubes were filled with water at 70 °C. The temperature of the water in test-tubes **A**, **B** and **C** was measured when the tubes were filled and then every two minutes for a total of ten minutes.

The results are shown in Table 1.1.

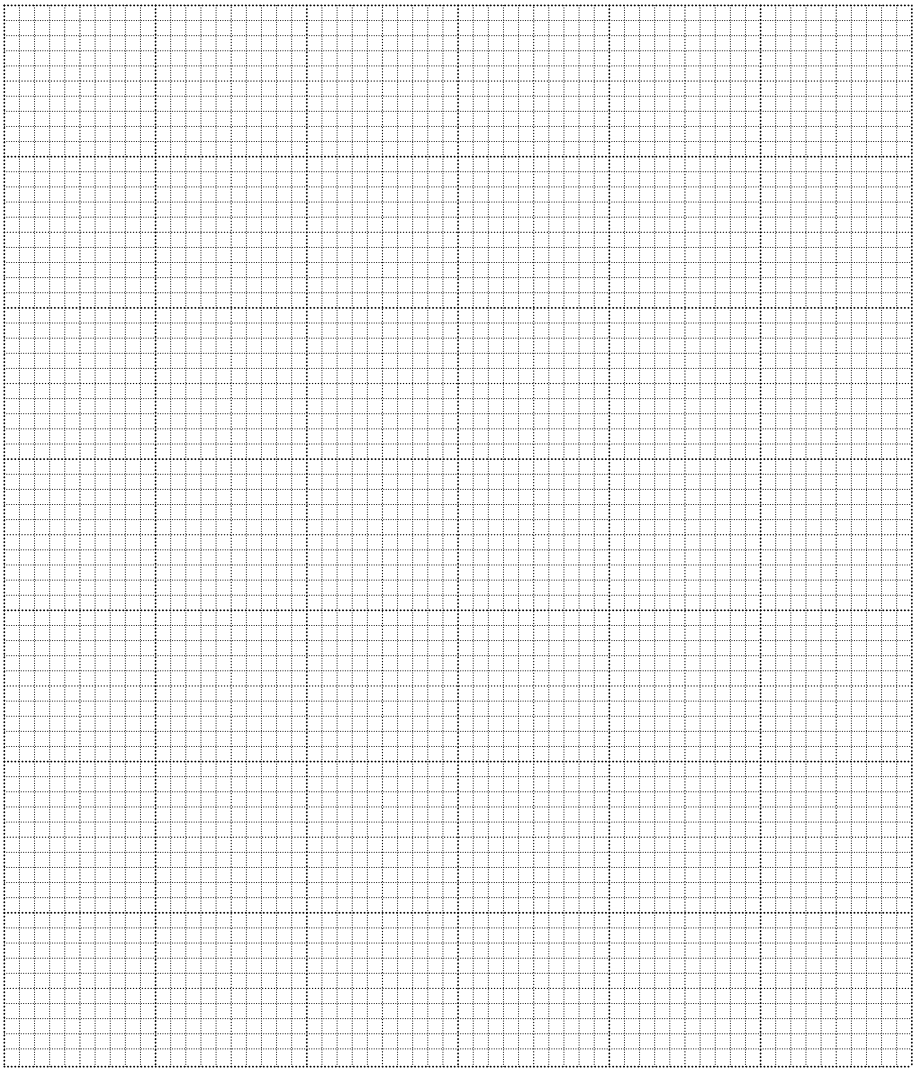
Table 1.1

time / minutes	temperature / °C		
	tube **A**	tube **B**	tube **C**
0	70	69	68
2	64	69	66
4	54	68	65
6	48	68	64
8	44	67	62
10	37	67	60

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(a) (i) On the grid below, plot the results for the **three** test-tubes **A**, **B** and **C** on the same axes.

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[6]

(ii) Describe and compare the temperature changes in each of the **three** test-tubes.

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..... [3]

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(iii) Suggest **and** explain **two** ways to improve this method to make the results more reliable.

improvement 1 .....

.....

explanation .....

.....

improvement 2 .....

.....

explanation .....

..... [4]

(b) (i) State which test-tube represents the animal that finds it easiest to maintain a constant body temperature.

..... [1]

(ii) Suggest **how** animals crowding together in a group can help them to maintain body temperature in cold weather.

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..... [2]

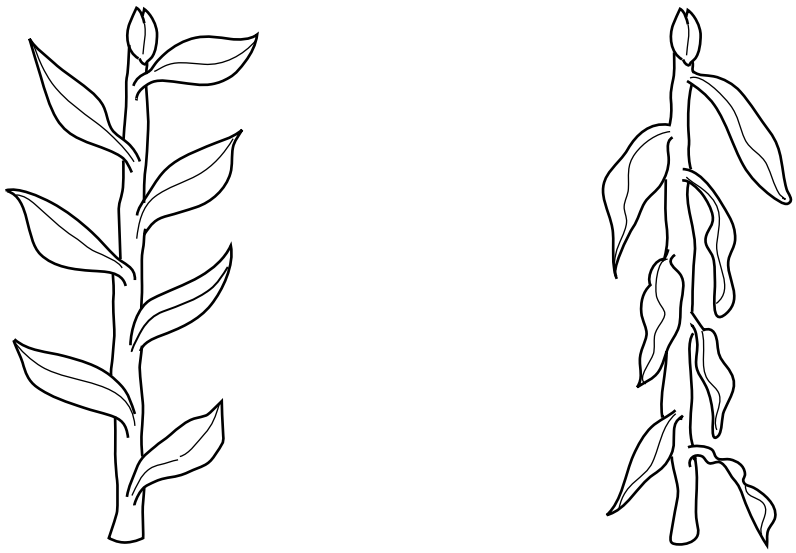
[Total: 16]

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2 When shoots are cut from plants, the leaves soon begin to wilt.

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Fig. 2.1 shows two similar shoots cut from the same type of plant. Immediately after cutting, the cut end of shoot **D** was placed in a beaker of water and the cut end of shoot **E** was placed in an empty beaker.



Shoot D **Shoot E**

Fig. 2.1

(a) Describe **two** differences between shoot **D** and shoot **E** as shown in Fig. 2.1.

.....

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.....

..... [2]

The cut ends of both shoots were placed in a beaker containing coloured water and left for ten minutes.

The shoots were removed and dried with a paper towel to remove the excess coloured water. The shoots were cut transversely every 10 mm and examined to see whether the coloured water had moved up the shoots.

Fig. 2.2 shows the sections from both stems as they were seen.

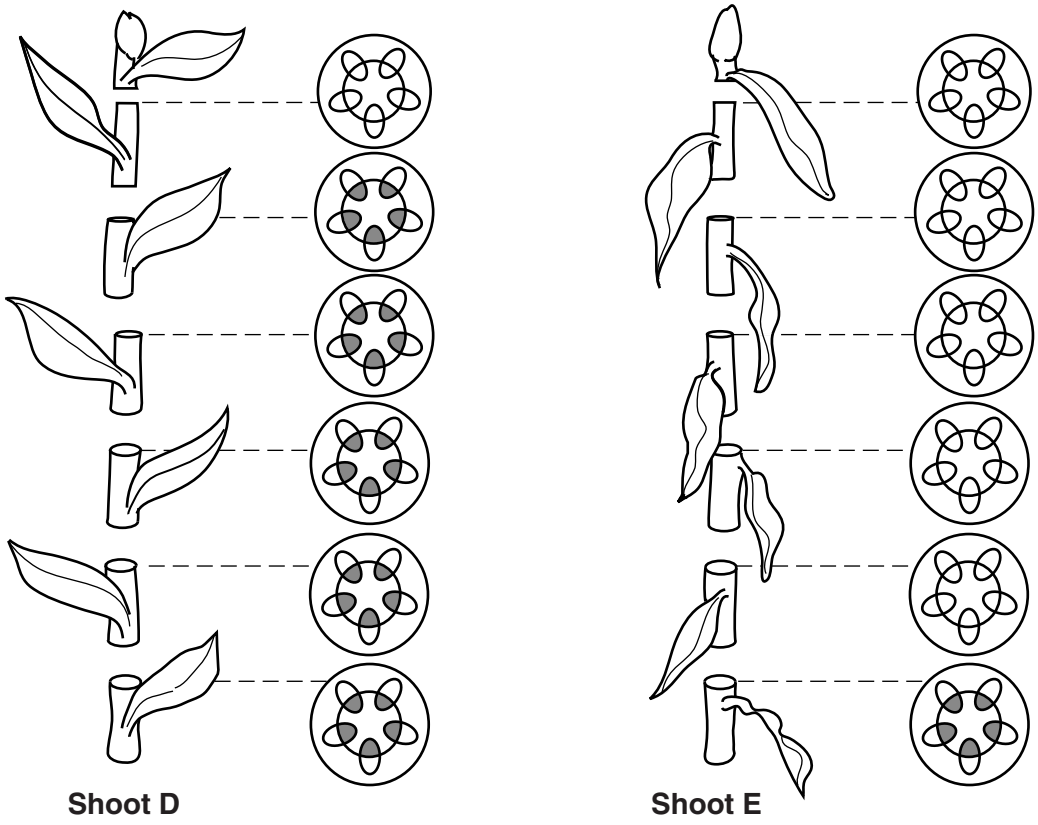


Fig. 2.2

(b) (i) Use Fig. 2.2 to count the number of sections that show some colour.

Record in Table 2.1. [2]

(ii) Use Fig. 2.2 to calculate the distance the coloured water has moved up in each shoot.

Record in Table 2.1.

Table 2.1

shoot **D**		shoot **E**	
number of sections with colour	distance coloured water has moved / mm	number of sections with colour	distance coloured water has moved / mm

[2]

(iii) Suggest which process caused the coloured water to move up these shoots.

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..... [1]

(iv) Suggest why this process took place at a faster rate in one of the shoots.

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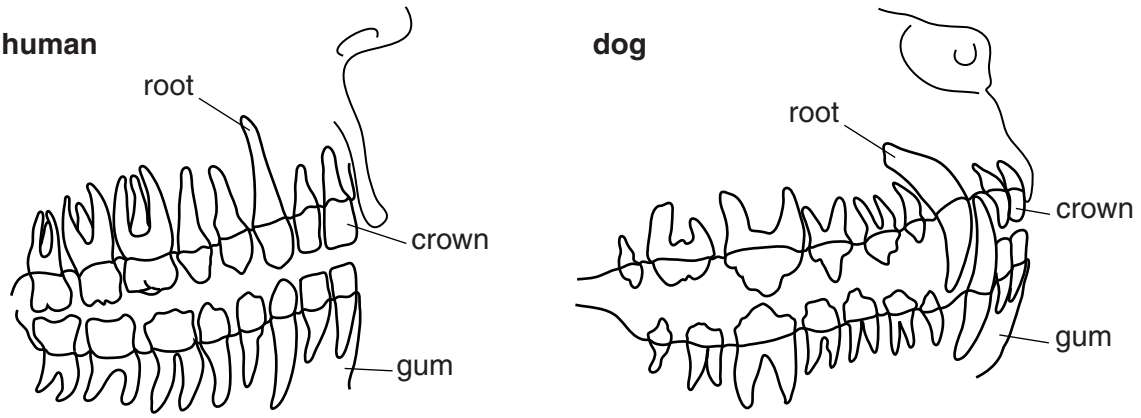
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..... [2]

[Total: 9]

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3 Fig. 3.1 shows the teeth in a human and in a dog, viewed from one side.



(not to scale)

Fig. 3.1

(a) (i) Using Fig. 3.1 for the human teeth, complete Table 3.1 to show some features of human teeth.

Table 3.1

type of tooth	approximate length of crown / mm	number of teeth in whole mouth	shape of crown	structure of root
incisor	10			single
canine	10	4		
premolar	10		uneven	
molar	10	12		

[3]

(ii) Describe the main function of incisors and of molars in humans.

incisor .....

molar .....

[2]

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The dog is a carnivore.

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(b) (i) Describe **three** features of dogs' teeth that are different from those in humans.

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..... [3]

(ii) Suggest a function of the dog's canine teeth.

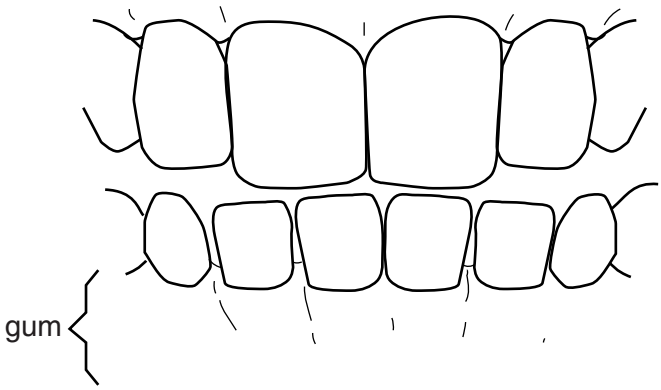
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..... [1]

Plaque is formed by the action of bacteria on food trapped between the teeth. This can lead to dental decay.

Fig. 3.2 shows, in outline, some human front teeth.

(c) Carefully shade in the areas where most plaque could be found.



[1]

Fig. 3.2

[Total: 10]

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4 Human urine is often tested to check if it contains glucose.

(a) Glucose is a reducing sugar.

Describe how you would test for glucose safely in your laboratory.

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..... [4]

(b) If a test shows the presence of glucose in urine, suggest what this might indicate.

..... [1]

[Total: 5]

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