UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

0449040685

BIOLOGY **5090/31**

Paper 3 Practical Test **October/November 2013**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials As listed in the Confidential Instructions.

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.

For Examiner's Use	
1	
2	
3	
Total	

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

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In order to plan the best use of your time, read through all the questions on this paper carefully before starting work.

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.

You will use test-tubes containing hot water to represent animals in an investigation into the loss of heat from animals' bodies.

One test-tube, **A**, will be used to represent one animal on its own as shown in Fig. 1.1.

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

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

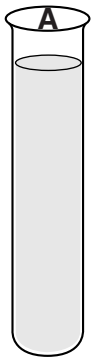


Fig. 1.1

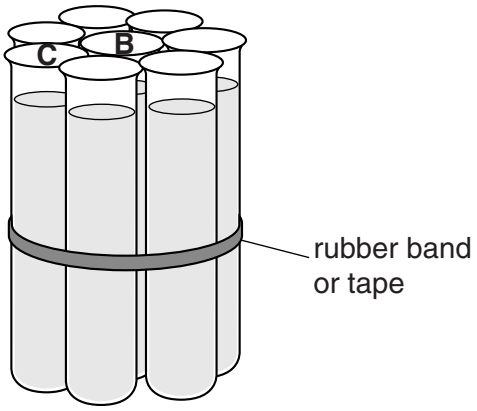


Fig. 1.2

All nine test-tubes will be filled with hot water. The temperature of the water in test-tubes **A**, **B** and **C** will be measured when the tubes are filled and then every two minutes for a total of 10 minutes.

(a) Construct a results table in the space below. Include the temperature of the water at the start and five readings taken at two minute intervals for each of test-tubes **A**, **B** and **C**.

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[5]

- Label the test-tubes **A**, **B** and **C**, as shown in Fig. 1.1 and Fig. 1.2.
- Support test-tube **A** in one container and the group of eight bound together in a second container.
- Ask for hot water to fill the test-tubes.
- Carefully fill each of the nine test-tubes with hot water to the same depth within 2 cm of the top.
- As soon as the water is in the test-tubes record the starting time below.

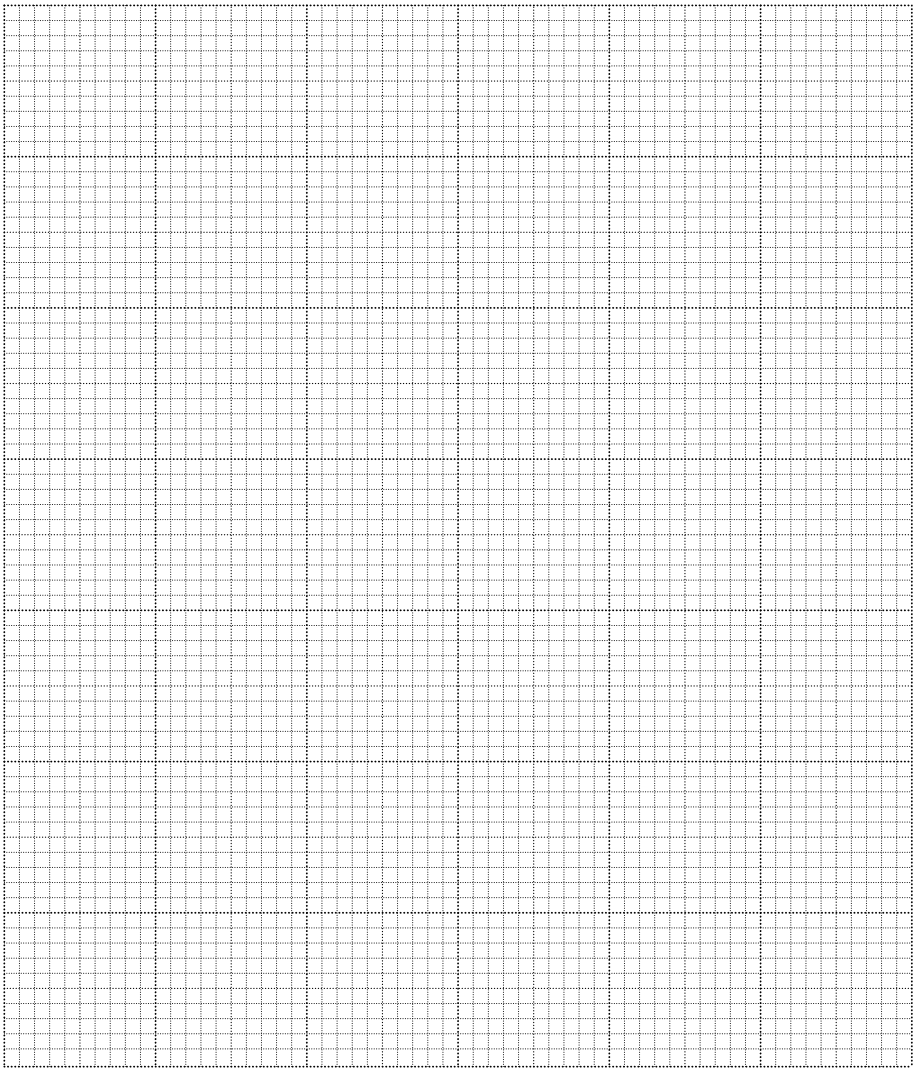
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- Use the thermometer to measure the temperature of the water in each test-tube **A**, **B** and **C** in turn. Record the measurements in your table.
- Repeat measuring and recording the temperature of the water in each of these test-tubes every two minutes until 10 minutes have passed.

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(b) (i) On the grid below, plot your 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.

.....

.....

.....

.....

.....

.....

..... [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]

(c) (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.

.....

.....

.....

..... [2]

[Total: 21]

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[Turn over for Question 2]

2 You are provided with two similar shoots cut from the same type of plant.

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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.

(a) Describe two noticeable differences between shoot **D** and shoot **E**.

.....

.....

.....

.....

..... [2]

You are provided with a beaker containing a small volume of blue coloured water.

- Remove shoots **D** and **E** from the beakers.
- Cut 1 cm from the base of each shoot and discard.
- Place the cut ends of the shoots in the blue coloured water.
- Note the time .....
- Leave for 5 minutes.

While you are waiting, start Question 3.

- After 5 minutes, remove shoot **D** and blot dry with a paper towel to remove the excess coloured water.
- Using the knife or scalpel provided, make a transverse cut every 5 mm.
- Keep these sections in the same order that they have been cut by arranging them on the white tile labelled **D**.
- Repeat the procedure with shoot **E** using the white tile labelled **E** to arrange these sections.

(b) (i) Count the number of sections for each shoot, that show some blue colour.

Record in Table 2.1. [2]

(ii) Calculate the distance the blue coloured water has moved up in each shoot.

Record in Table 2.1.

Table 2.1

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

[2]

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(iii) Suggest which process caused the blue 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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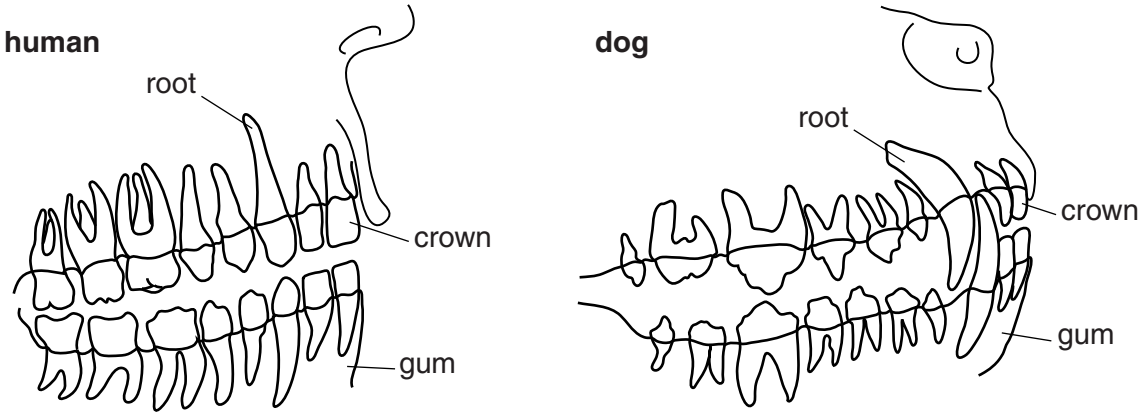
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..... [2]

[Total: 9]

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

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(not to scale)

Fig. 3.1

(a) (i) Using Fig. 3.1 for the human teeth, complete Table 3.1 to describe 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]

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.

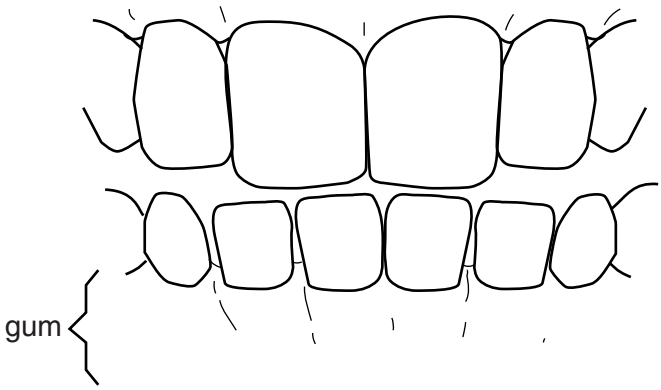
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..... [1]

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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