Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

2425699758

BIOLOGY **0610/61**

Paper 6 Alternative to Practical **October/November 2016**

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **11** printed pages and **1** blank page.

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1 Some animals have a body temperature that is higher than the temperature of the environment. As a result these animals lose heat to the environment, causing their body temperature to fall.

An investigation was carried out to find the effect of the volume of the body on the loss of heat to the environment.

The volume of the body of an animal and its temperature can be represented by hot water.

Step 1 Two 250 cm^3 beakers were labelled **A** and **B**.

Step 2 A line was drawn on beaker **A**, 6 cm up from the bottom of the beaker.
A line was drawn on beaker **B**, 3 cm up from the bottom of the beaker.

Step 3 Hot water was added to both beakers up to these marks.

Step 4 A thermometer was placed in the water in each beaker and a timer started.
The temperature of the water was measured immediately in both beakers and recorded in a results table.
The thermometers were left in the water throughout the investigation.

Step 5 The temperature of the water in both beakers was measured and recorded every minute for five minutes.

Fig. 1.1 on page 3 shows the results of this investigation

(a) Prepare a table in the space provided to record these results. Use Fig. 1.1 to complete this table.

[5]

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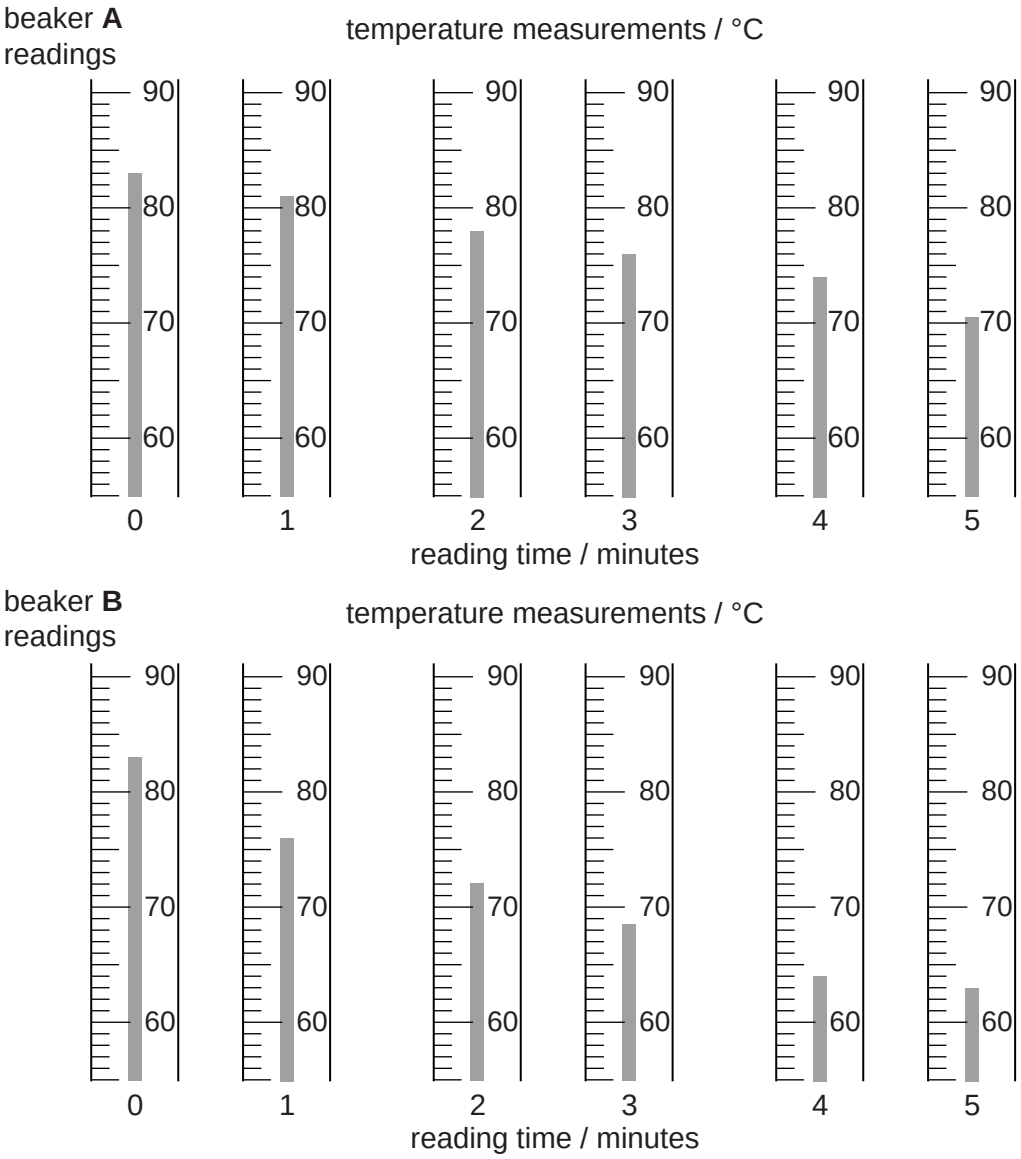


Fig. 1.1

(b) (i) The rate of heat loss is the fall in temperature per minute.

Calculate the rate of heat loss between 0 and 5 minutes for both beakers.
Include the units.

Show your working.

beaker **A**

.....

beaker **B**

.....
[4]

(ii) Using your results, suggest a relationship between the volume of the body and heat loss.

.....

.....

.....

.....[2]

(c) (i) State **two** variables in this investigation that have been controlled.

1 .....

2 .....
[2]

(ii) Suggest why the thermometer must be left in the water throughout the investigation.

.....

.....[1]

(iii) There is a possible source of error in step 2 of the investigation.

Identify this source of error and describe how to modify step 2 to improve the investigation.

.....

.....

.....

.....[2]

(iv) Suggest **one** safety precaution students should take while carrying out this investigation.

.....

.....[1]

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(d) Some students were asked to test the hypothesis:

The colder the surroundings, the faster a small mammal's temperature will drop.

Describe how the students could modify the investigation described in steps 1–5 to test this hypothesis.

.....

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.....[6]

(e) Humans sweat when they get too hot.

The effect of the temperature of the room on the average rate of sweating was investigated.

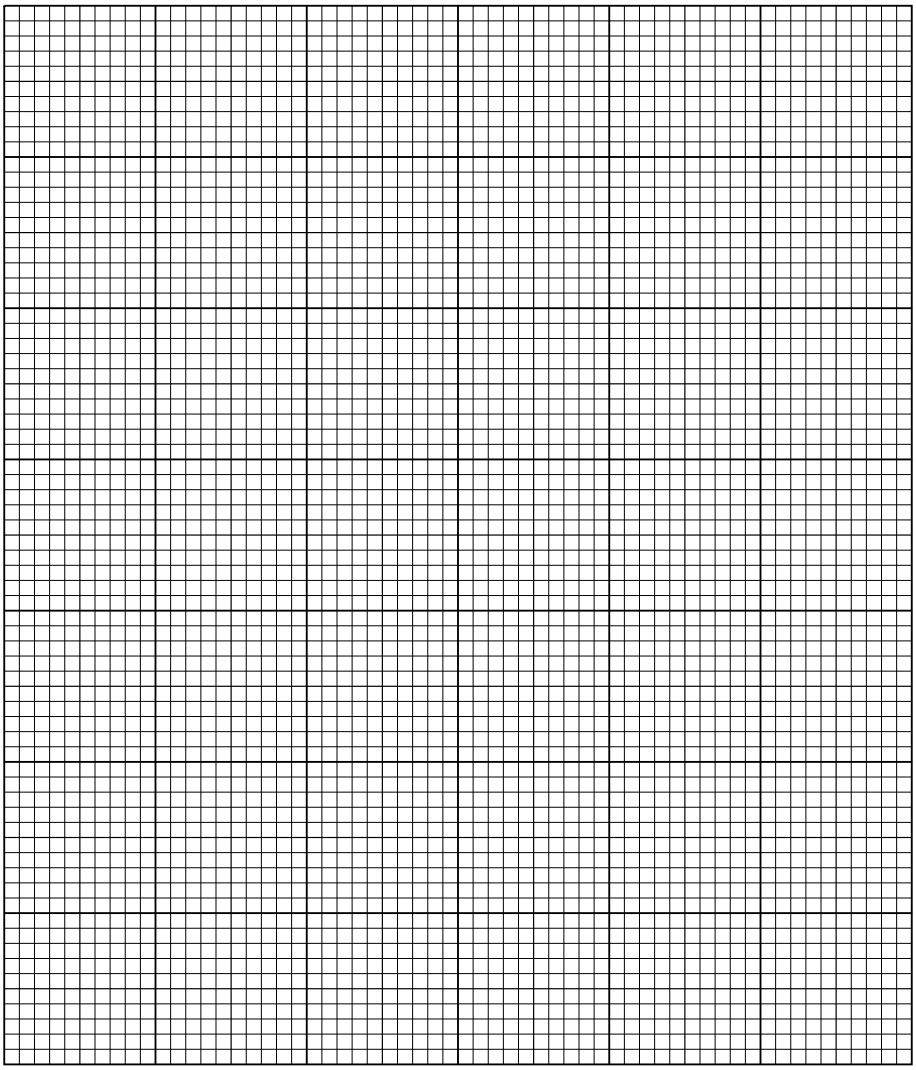
The results are shown in Table 1.1.

Table 1.1

temperature of the room / °C	average rate of sweating / cm^3 per hour
13	10
22	40
30	320
36	740
40	1180

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(i) Plot a graph, using the data in Table 1.1, on the grid.



[4]

(ii) Describe the effect of the temperature of the room on the average rate of sweating.

.....

.....

.....

.....[2]

[Total: 29]

2 Fig. 2.1 shows photographs of five different flowers, **A**, **B**, **C**, **D** and **E**.
Some of the structures of flowers are labelled on the photographs.

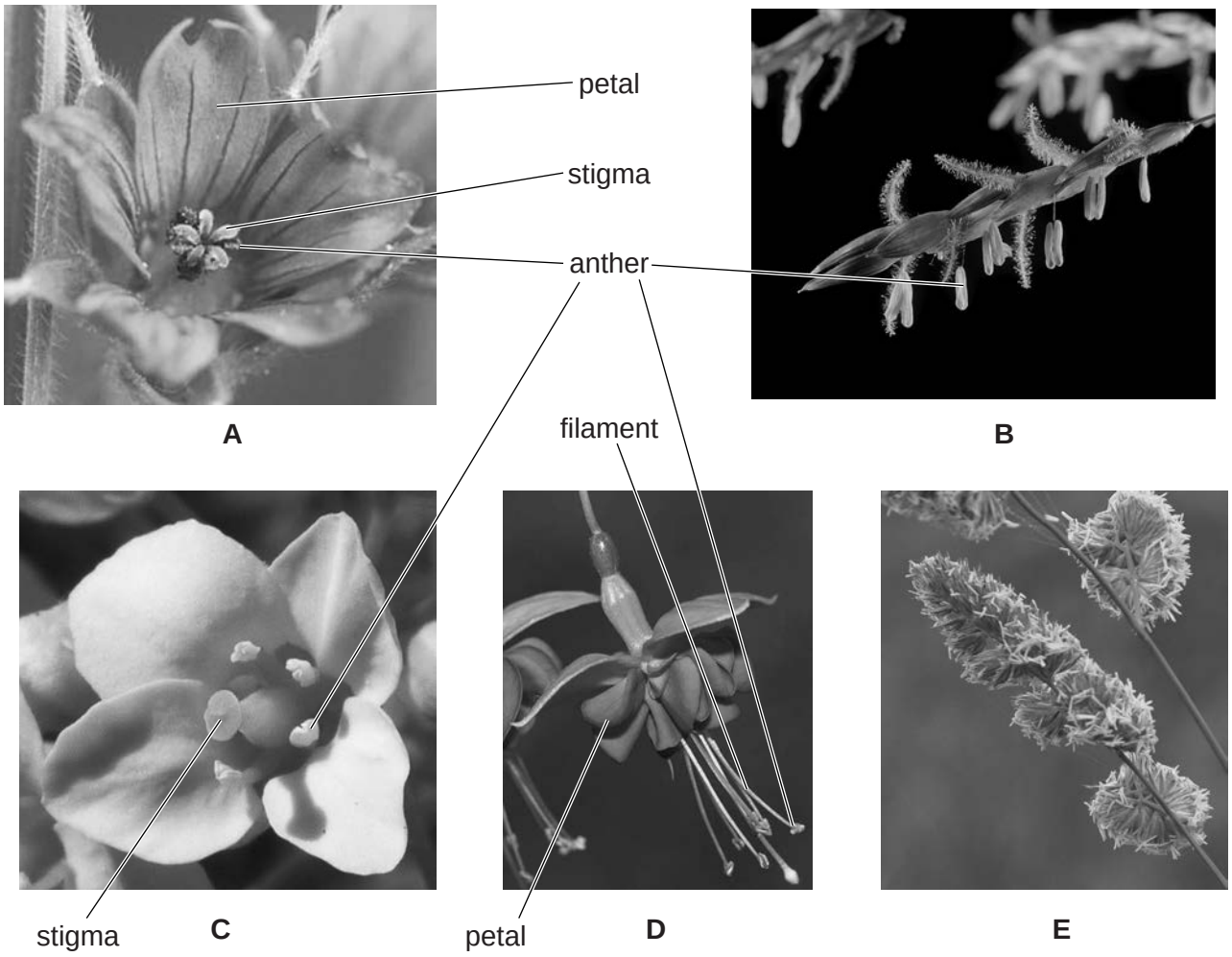


Fig. 2.1

The genus of the five flowers can be identified using this key:

1. petals present and large ..... go to 2
   petals absent or very small ..... go to 4

2. four petals ..... *Draba*
   more than four petals ..... go to 3

3. stigma clearly divided into 5 ..... *Geranium*
   stigma not clearly divided ..... *Fuschia*

4. anthers large and hanging on long filaments away from flower ..... *Sorghum*
   anthers small and close to flower ..... *Dactylis*

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(a) Use the key to identify flowering plants **A**, **B**, **C**, **D** and **E**.

letter	genus of flower
A	
B	
C	
D	
E	

[4]

(b) Fig. 2.2 shows five stamens (anthers and filaments) from an insect pollinated flower, *Gloriosa superba*.



Fig. 2.2

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(i) Make a large labelled drawing of the stamen enclosed by the box on Fig. 2.2.

[4]

(ii) Measure the length of the filament on Fig. 2.2.
Include the unit.

Length of filament on Fig. 2.2 .....

Measure the length of the filament on your drawing.

Draw a line on your drawing to show where you measured the filament.

Length of filament on your drawing .....

$$\text{magnification} = \frac{\text{length of filament on your drawing}}{\text{length of filament on Fig. 2.2}}$$

Calculate the magnification of your drawing using the information above and your answers.

Show your working.

magnification .....
[3]

[Total: 11]

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