UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level
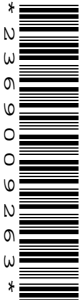
CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **5090/03**

Paper 3 Practical Test **May/June 2007**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As specified in the Confidential Instructions.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all 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 **both** 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	
Total	

This document consists of **7** printed pages and **1** blank page.

UNIVERSITY *of* CAMBRIDGE
International Examinations

[Turn over

1 The human body maintains a constant temperature regardless of the external temperature even though heat may be transferred to or from the environment.
Fig. 1.1 shows the apparatus you will use to investigate heat transfer.
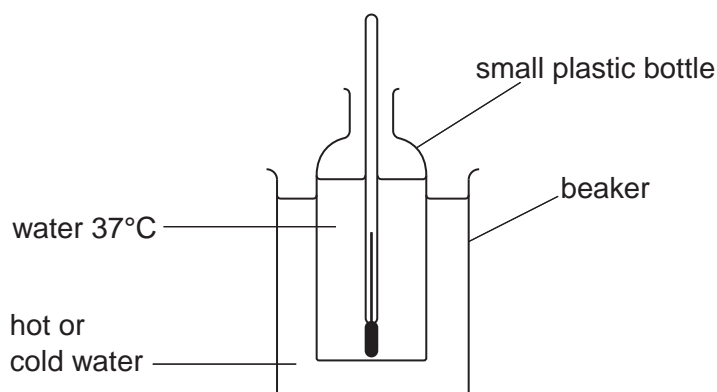

Fig. 1.1

The small plastic bottle represents the human body.
The water in the beaker represents the external environment.

Read through the following instructions before you attempt question (a)(i).

- Half fill the plastic bottle with water at approximately 37°C (supplied by your supervisor).
- Measure the temperature of the water in the plastic bottle and record it in the table you have prepared below.
- Immediately place the plastic bottle in the beaker of ice-cold water.
- Then measure the temperature of the water in the bottle every minute for five minutes and record your measurements.
- Between readings, gently move the bottle around in the beaker.
- Replace the water in the plastic bottle with water at 37°C and replace the water in the beaker with hot water (both supplied by your supervisor).
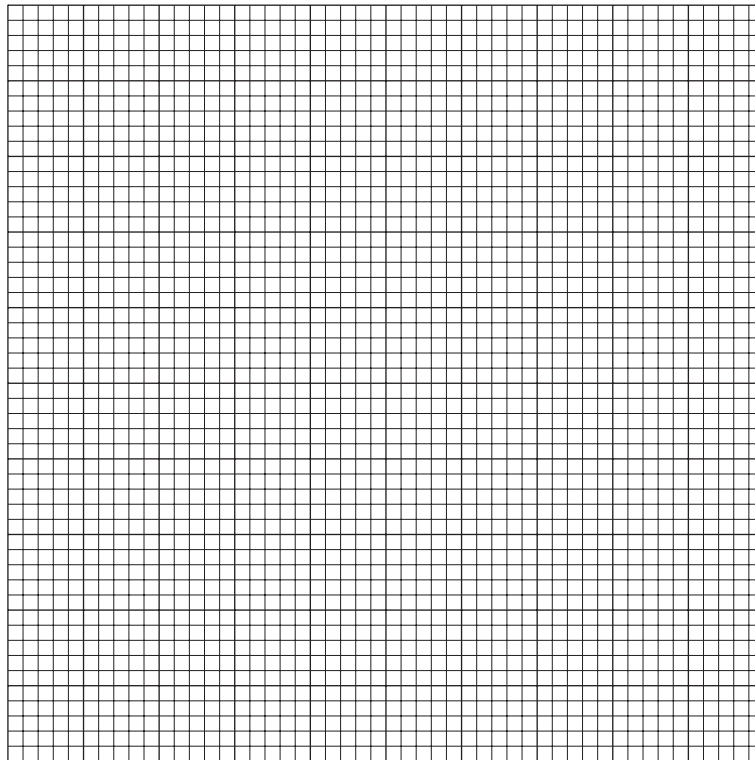- Measure the temperature and record for five minutes as before.

(a) (i) Prepare a table in the space below for the recording of your results.

Follow the instructions to set up the apparatus as shown in Fig. 1.1 and take the measurements as instructed.

[5]

(ii) Plot your two sets of results on the same axes on the grid below.

[5]

(b) **(i)** State why the water provided for the bottle should have been at 37°C.

....

....[1]

(ii) Suggest why the bottle was moved around in the beaker between the readings.

....

....[1]

(iii) Describe how you read the thermometer to ensure your readings were accurate.

....

....[1]
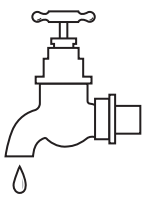
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4

(c) Fill in the gaps in the following conclusion to this experiment.
Use words from the following list once, more than once, or not at all.

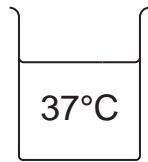   hot   cold   loses   gains   to   from

(i) The water in the bottle .... heat to the ice cold water in the

beaker, as happens in a human being in a .... place.

Heat is transferred .... the hot water in the beaker to the

water in the bottle, as happens in a human being in a .... place. [2]

(ii) Draw a line on the graph to show what would happen to the starting temperature of 37 °C if the bottle responded like a real human being when placed in the hot water.
[1]

(d) Design, but do **not** carry out, an experiment, using the apparatus shown in Fig. 1.2, to show how sweating helps to maintain a constant body temperature.
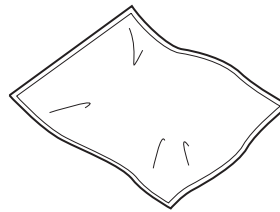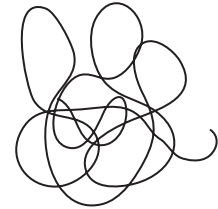Give full practical details.

| tap | beaker of warm water | thermometer | cloth | string |

37°C

Fig. 1.2

....

....

....

....

....

....

....

....

....[6]

[Total : 22]

2 You are provided with four leaves labelled **A**, **B**, **C** and **D** which were initially all of the same size and from the same plant.

Leaf **A** is freshly picked and has received no treatment.

Leaf **B** was picked three days ago.

Leaf **C** was picked three days ago and its **upper** surface coated immediately with petroleum jelly.

Leaf **D** was picked three days ago and its **lower** surface coated immediately with petroleum jelly.

Leaves **B**, **C** and **D** have been left by a window in the laboratory since they were picked.

(a) (i) Make a large, labelled drawing of the lower surface of leaf **A**.

[4]

(ii) Measure and record the width of leaf **A** at its widest point.

width of leaf ....

Draw a straight line across the widest point of your drawing of leaf **A**.
Measure and record the length of your line.

Length of line .... [2]

(iii) Calculate the magnification of your drawing.
Show your working.

magnification .... [2]

(b) Examine leaves **B**, **C** and **D** and describe their appearance and texture.

   (i) leaf **B** ....

          ....

       leaf **C** ....

          ....

       leaf **D** ....

          ....[3]

   (ii) Suggest a reason for the difference in appearance and texture between:

       Leaf **B** and **C** ....

          ....

       Leaf **C** and **D** ....

          ....[2]

(c) You are also provided with a leaf stalk from a different plant, labelled **E**, that has been
left to stand in a beaker of dye.
Cut it in half across its width.
Examine the cut surface.

   (i) Make a large, labelled drawing of the cut surface.

[3]

(ii) Suggest where in Leaf **A** you might find a tissue similar to that which is stained in specimen **E**.

....[1]

(iii) Draw a simple diagram of a transverse section of a root and indicate where the same tissue that is stained in the leaf stalk would be found.

[1]

[Total : 18]

[Paper total : 40]

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