UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

* 1 1 9 8 4 3 2 5 2 9 *

Biology **0610/52**

Paper 5 Practical Test **May/June 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 or graphs.
Do not use staples, paper clips, highlighters, 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.

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1	
2	
3	
Total	

This document consists of **13** printed pages and **3** blank pages.

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Read through the whole question before starting work.

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1 You are presented with two similar cut shoots in test-tubes that contained 20 cm^3 of water at the start.

One shoot still has its leaves attached and the other shoot has had its leaves removed.
The shoots were placed in the water immediately after being cut. The water level was marked on the outside of the test-tubes.
A small quantity of oil was added to cover the water in these test-tubes.
The two test-tubes containing the shoots were left in the light for two days.

(a) (i) Suggest why oil was placed on top of the water in both test-tubes.

.....

..... [1]

(ii) Use a ruler to measure the height of the water in the two test-tubes.

test-tube containing shoot without leaves ..... mm

test-tube containing shoot with leaves ..... mm [1]

(iii) Describe **and** explain your observations.

.....

.....

.....

..... [2]

(b) (i)

- Remove the shoots from the test-tubes.
- Use water from the beaker of water, labelled **water**, to wash any oil from the shoots.
- Dry the cut end of each shoot and place the shoots on the white tile.
- Use the scalpel to remove approximately 3 cm from the cut end of each shoot.
- Immediately place both shoots in the beaker of coloured water, labelled **coloured water**.
- Leave for 15-20 minutes.

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While you are waiting, continue with part (c) of this question.

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- After 15-20 minutes remove the shoots from the coloured water.
- Use water from the beaker of water, labelled **water**, to remove any coloured water from the outside of the shoots.
- Place the shoot without leaves on the white tile.
- Use the scalpel to remove 5 mm long sections from the cut end of the shoot, as shown in Fig. 1.1.
- Keep the sections in the order in which you removed them.
- Use the hand lens to observe each section.
- Continue removing sections until the coloured water is not visible in the stem, as shown in Fig. 1.1.

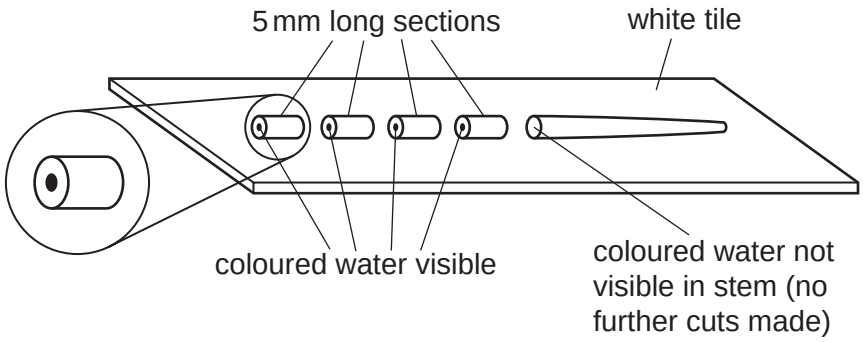

Fig. 1.1

Estimate the distance moved by the coloured water in the shoot without leaves.

.....mm

- Push the sections and remaining stem of the shoot without leaves to the edge of the white tile.

- Place the shoot with leaves on the white tile.
- Use the scalpel to remove 5 mm long sections from the cut end of the shoot, as shown in Fig. 1.1.
- Keep the sections in the order in which you removed them.
- Use the hand lens to observe each section.
- Continue removing sections until the coloured water is not visible in the stem, as shown in Fig. 1.1.

Estimate the distance moved by the coloured water in the shoot with leaves.

.....mm [3]

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(ii) Use the hand lens to observe the cut end of the second section of the shoot with leaves.

Draw and label the cut end of this section to show the location of the coloured water.

[2]

(iii) Do the results in **(b) (i)** support the observations in **(a) (ii)**? Explain your answer.

.....

.....

.....

..... [2]

Question 1 continues on page 6.

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(c) A group of students measured the mass lost from a flask containing a shoot with leaves.
The shoot was placed in water, on a balance as shown in Fig. 1.2.
An automatic data logger recorded the mass every six hours for two days.

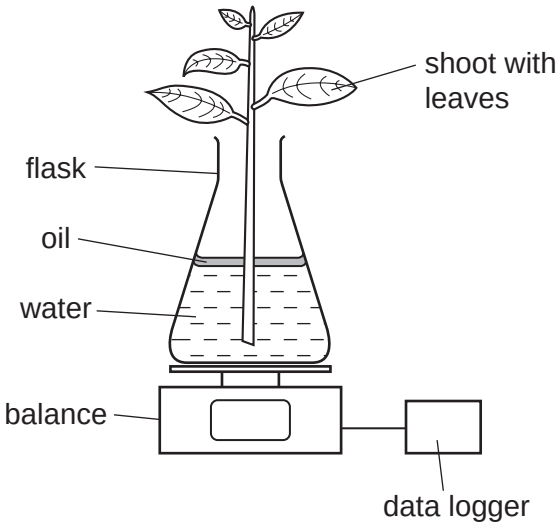

Fig. 1.2

Only natural light from the sun was allowed to fall on the shoot.

The students calculated the mass lost every six hours. The data is shown in Table 1.1.

Table 1.1

time of day	mass lost / g
10:00	0.0
16:00	3.0
22:00	5.0
04:00	5.0
10:00	7.0
16:00	10.0
22.00	11.5
04.00	11.5
10.00	13.5

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(i) Plot the data from Table 1.1 on Fig. 1.3.

[4]

Fig. 1.3

(ii) Describe **and** explain the results.

description .....

.....

explanation .....

.....

.....

..... [3]

Fig. 1.4 shows part of the lower surface of a leaf as viewed under a microscope.

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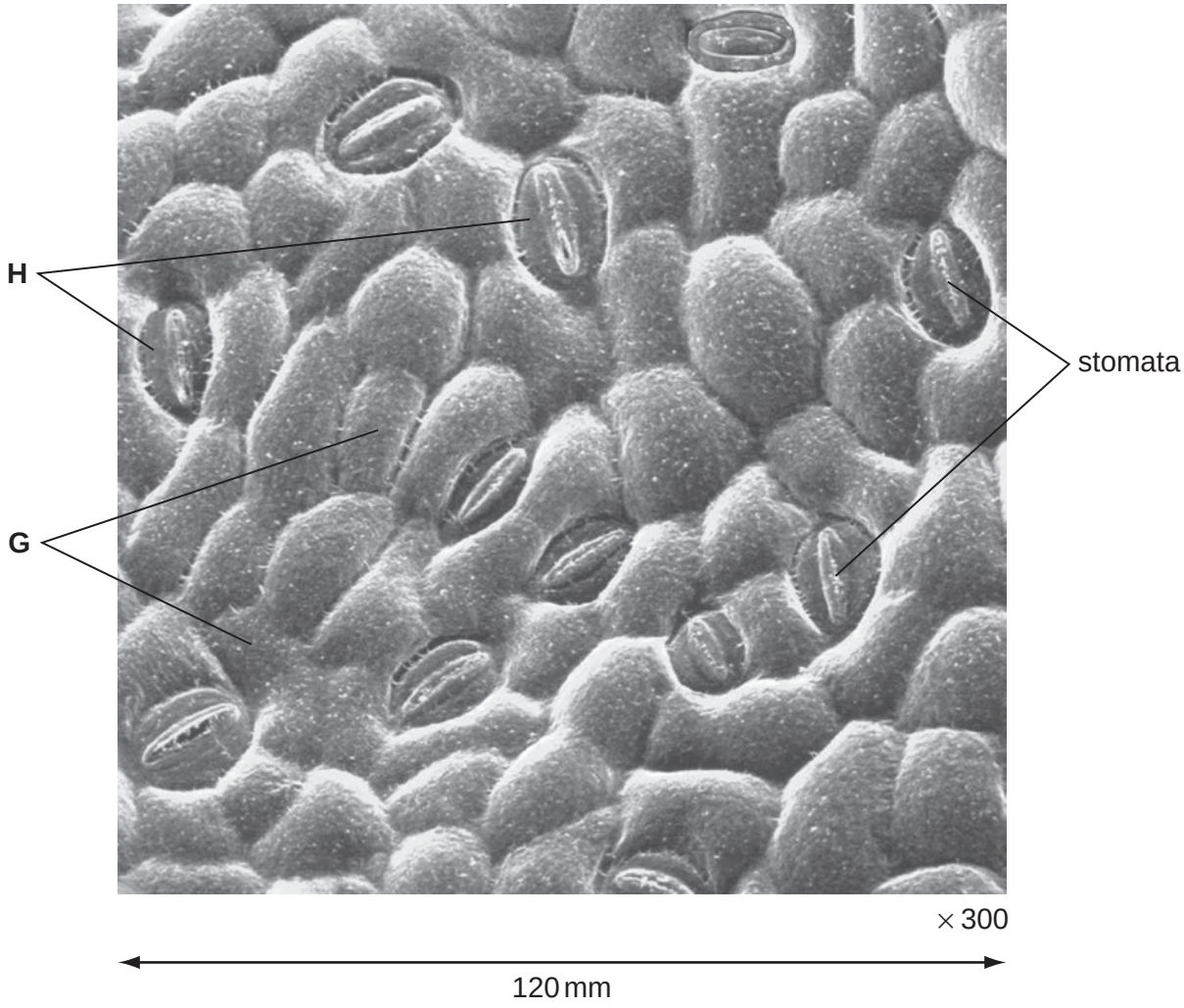

Fig. 1.4

(d) Name the structures labelled **G** and **H**.

G .....

H ..... [2]

(e) The number of stomata on the lower surface of the leaf can be calculated by using Fig. 1.4.

(i) Count the number of stomata visible in Fig. 1.4.

number of stomata ..... [1]

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(ii) The magnification of the image in Fig. 1.4 is × 300.

The length of one side of the image is 120 mm. The image is a square.

You can calculate the actual length of one side of the square of leaf surface shown in Fig. 1.4 by dividing the length of one side of the image by the magnification.

Calculate the actual length of one side of the square of leaf surface shown in Fig. 1.4.
Show your working.

actual length of one side of the square of leaf surface ..... mm [1]

(iii) Calculate the actual total area of the square of leaf surface shown in Fig. 1.4.
Show your working.

actual total area of the square of leaf surface ..... mm^2 [2]

(iv) The number of stomata per mm^2 can be calculated from the number of stomata and the actual total area of the square of leaf surface shown in Fig. 1.4.

Calculate the number of stomata per mm^2 of this leaf.
Show your working.

number of stomata per mm^2 ..... [2]

(v) The total area of the lower surface of this leaf was measured and found to be 9000 mm^2.

Calculate the total number of stomata on the lower surface of this leaf.
Show your working.

total number of stomata ..... [1]

[Total: 27]

2 You are going to observe and draw one of your fingers.

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(a) Place the palm of your hand on the paper.
Use the hand lens to examine one finger.

Make a large, labelled drawing of this finger.

[4]

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(b) Fig. 2.1 shows the European mole, *Talpa europa*.

Fig. 2.1

(i) State **one similarity**, **visible** in Fig. 2.1, between the structure of the mole's hand and your hand.

.....

..... [1]

(ii) Complete Table 2.1 to state **two differences**, **visible** in Fig. 2.1 between the shape and size of the mole's hand and your hand.

feature	mole's hand	your hand
shape		
size		

[2]

(c) (i) Name the group of vertebrates to which the mole belongs.

..... [1]

(ii) State **one** feature, **visible** in Fig. 2.1, that supports your answer to **(c)(i)**.

.....

..... [1]

[Total: 9]

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3 Arum lilies, such as *Arum maculatum*, are plants that have a smell like rotting meat.
The smell attracts flies so that the flowers can be pollinated.
Some arum lilies have a purple coloured sheath and some have a light green coloured sheath.

Fig. 3.1 shows an arum lily with part of the sheath cut away to show the inside.

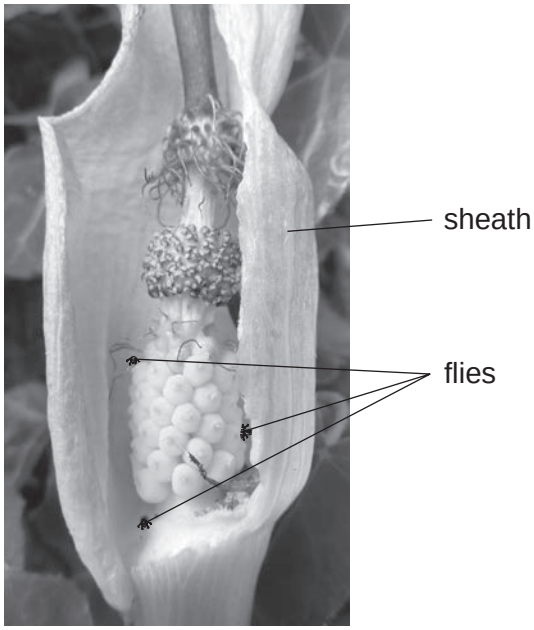

Fig. 3.1

A group of students collected arum lilies from the same habitat, **two** with purple coloured sheaths and **three** with light green coloured sheaths.
They opened the sheaths of each lily and counted the number of flies inside.

The results are shown in Table 3.1.

Table 3.1

colour of sheath	number of flies	total number of flies	mean number of flies
purple	3		
purple	5		
light green	5		
light green	6		
light green	4		

(a) Calculate the total **and** mean number of flies found in each colour of sheath.

Write your answers in Table 3.1. [2]

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(b) Suggest **two** ways in which this investigation could be improved.

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1 .....

.....

2 .....

..... [2]

[Total: 4]

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