UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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| CANDIDATE NAME | |
| CENTRE NUMBER | |
| CANDIDATE NUMBER | |

**BIOLOGY** **0610/63**

Paper 6 Alternative to Practical **October/November 2012**

**1 hour**

Candidates answer on the Question Paper.

No Additional Materials are required.

*2870861678*

**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.

| For Examiner's Use | |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| Total | |

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

**BLANK PAGE**

For Examiner's Use

**1** Fig. 1.1 shows a woodlouse.

**Fig. 1.1**

**(a) (i)** Name the invertebrate group to which this animal belongs.

..... [1]

**(ii)** Describe **two** features that are characteristic of this invertebrate group.

1 .....

2 ..... [2]

Small invertebrates such as woodlice respond to different environmental conditions.

24 woodlice were placed in a choice chamber linked by a connecting passage, as shown in Fig. 1.2.

12 of the woodlice were placed in the damp area on one side of the choice chamber; the other 12 were placed in the dry area on the other side of the choice chamber.

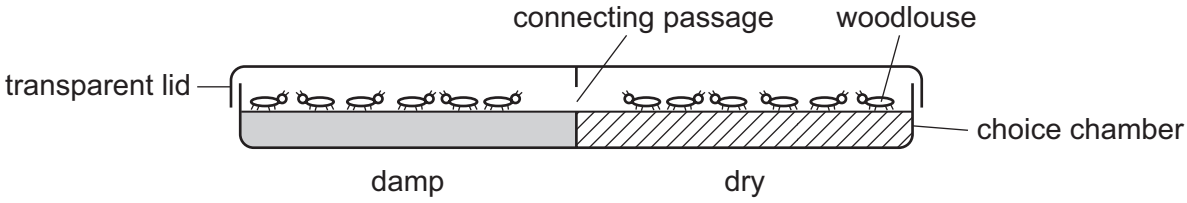



**Fig. 1.2**

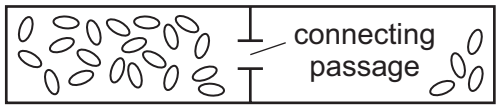
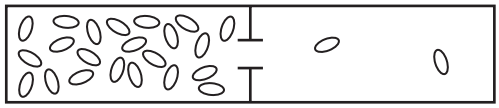
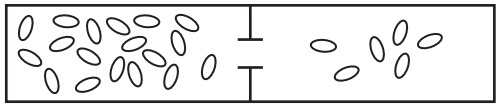
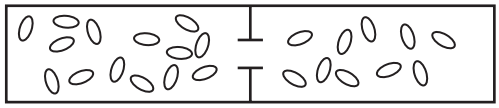
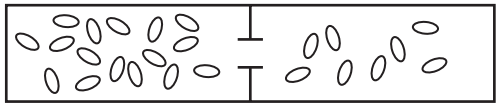
After 5 minutes the number of woodlice in each area of the chamber was recorded.

The woodlice were released into their natural environment.

This procedure was repeated **four** more times using different woodlice.

The results are shown in Table 1.1.

**Table 1.1**

| trial | positions of woodlice | | number of woodlice in the damp area | number of woodlice in the dry area |
|---|---|---|---|---|
| | damp area | dry area | | |
| 1 |   | | ..... | ..... |
| 2 |  | | ..... | ..... |
| 3 |  | | ..... | ..... |
| 4 |  | | ..... | ..... |
| 5 |  | | ..... | ..... |
| | total | | ..... | ..... |
| | mean | | ..... | ..... |

**(b)** Complete Table 1.1 by:

**(i)** counting and recording the number of woodlice in each area of the choice chamber for each trial;

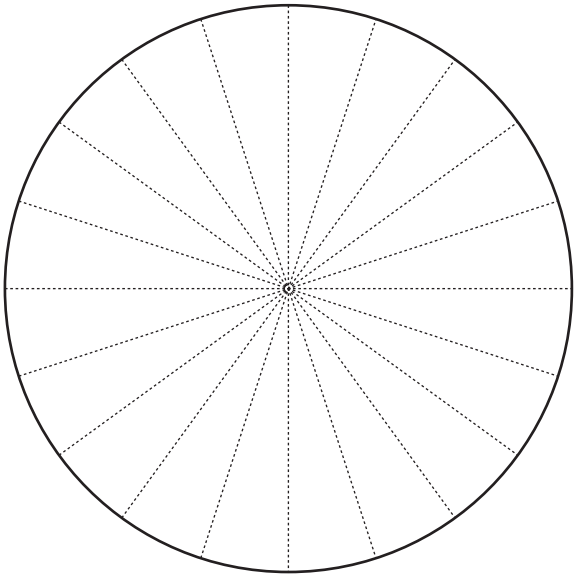
[2]

**(ii)** calculating the total number of woodlice and the mean for each area.

[2]

**(c)** Draw a pie-chart on the diagram below to show the mean number of woodlice in each area of the chamber. Give a key to identify the areas.

*For Examiner's Use*



**Key**

. [2]

**(d)** Explain how the behaviour of the woodlice would help them to survive in their natural habitat.

.....

.....

.....

.....

.....

..... [3]

**(e)** Suggest how you might improve this investigation.

.....

.....

.....

.....

.....

..... [3]

[Total: 15]





**[Turn over**

**2** The water hyacinth, *Eichhornia crassipes*, is a free-floating perennial water plant found in many parts of the world.

Fig. 2.1 and Fig. 2.2 show plants growing on the surface of water.

**Fig. 2.1**

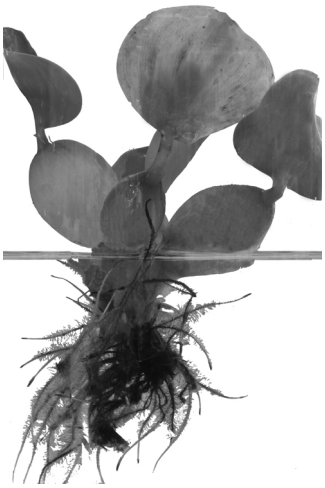


**Fig. 2.2**

Fig. 2.3 shows a leaf from one of the water hyacinth plants.

**Fig. 2.3**

**(a)** Make a large, labelled drawing of the leaf in Fig. 2.3 to show the whole leaf, including the swollen leaf stalk.

*For Examiner's Use*

[4]

Fig. 2.4 shows a cross section through a swollen leaf stalk.



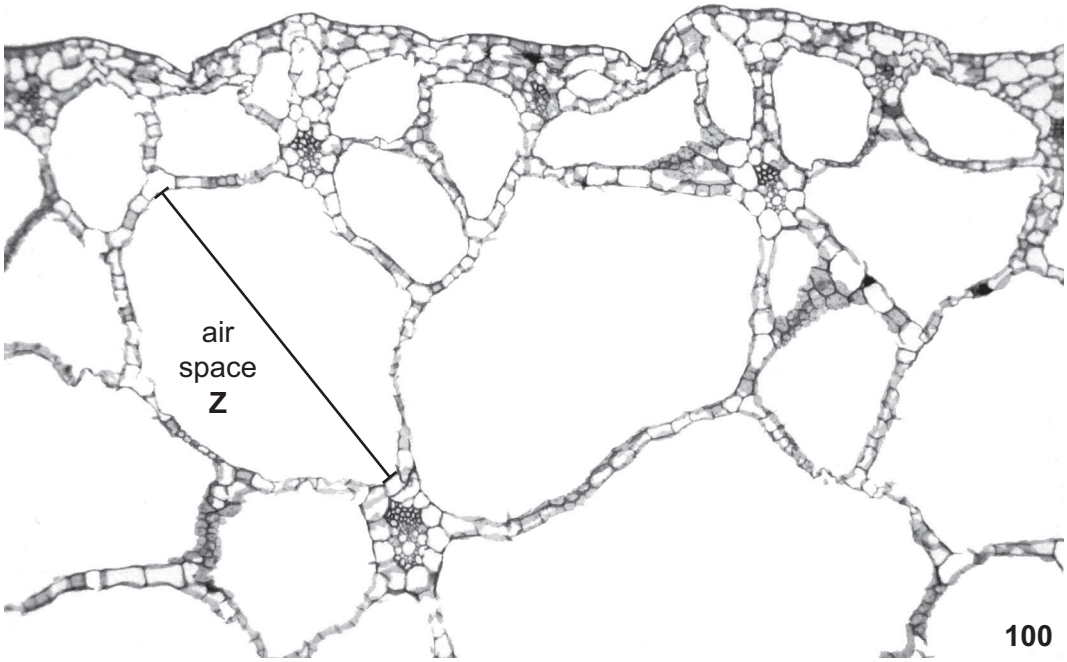



**Fig. 2.4**

**(b)** The internal tissue is shown in Fig. 2.4. The internal tissue has many large air spaces between the cells.

Measure the size of the air space **Z** on Fig. 2.4.

size of air space **Z** ..... mm

Use your measurement to calculate the actual size of air space **Z**.

Show your working.

actual size of air space **Z** ..... mm [3]

**(c)** Using the information provided, suggest how the structure of the leaf stalk helps the plant to grow in the environment in which it is found.

.....

.....

.....

..... [2]

Water hyacinths will flower and form seeds in warm climates. They can also reproduce and spread asexually (by vegetative means).

*For Examiner's Use*

The growth rate can be very rapid and so the plant can become a problem and spread over the surface of rivers and lakes.

**(d) (i)** Suggest **two** ways in which the spread of this water plant can harm other aquatic organisms.

1 .....

.....

2 .....

..... [2]

**(ii)** Suggest **two** ways in which the spread of the plant could be controlled.

1 .....

.....

2 .....

..... [2]

[Total: 13]

*For Examiner's Use*

**3** A protease enzyme digests the white protein in milk to form a clear soluble product.

Some students carried out an investigation to find the effect of temperature on this process.

5 $cm^3$ of milk and a few drops of enzyme were warmed separately to 40 °C and then mixed together. The time taken for the white mixture to clear was recorded. This procedure was repeated two more times at this temperature.

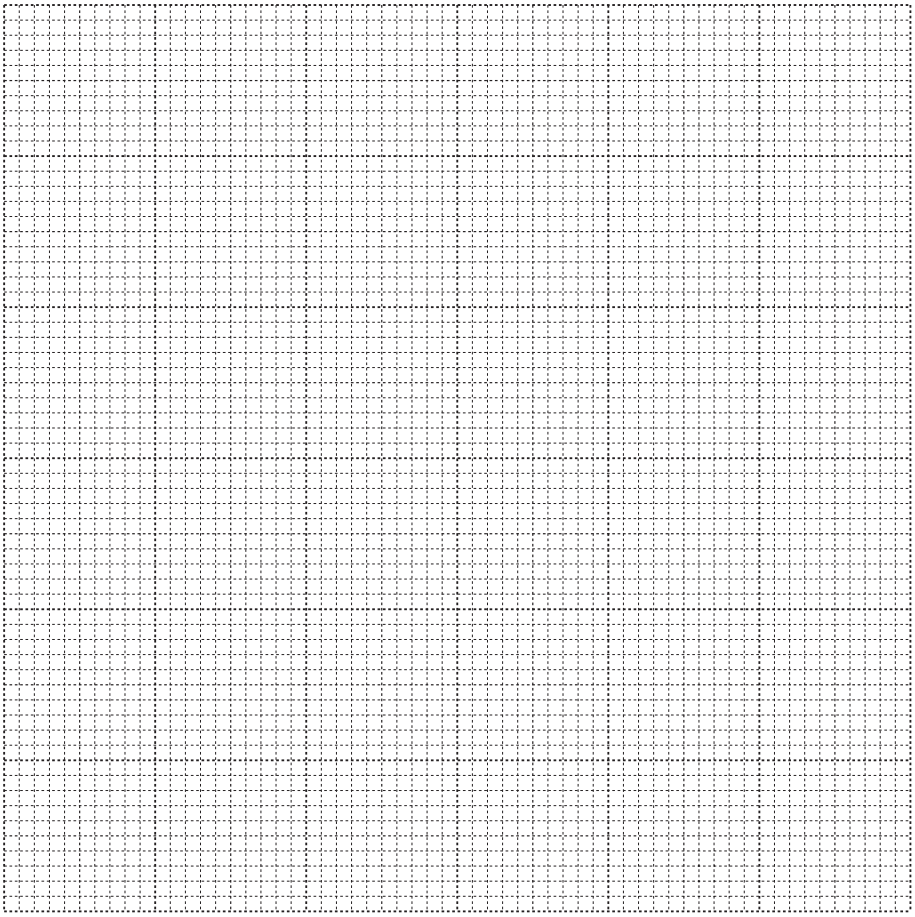
The whole procedure was repeated for a range of temperatures and all the results were recorded in Table 3.1.

**Table 3.1**

| temperature / °C | time for milk to clear / seconds | | | |
|---|---|---|---|---|
| | 1st test | 2nd test | 3rd test | mean |
| 20 | 120 | 110 | 115 | 115 |
| 30 | 60 | 55 | 59 | 58 |
| 40 | 30 | 35 | 28 | 31 |
| 50 | 19 | 25 | 22 | 22 |
| 60 | 80 | 75 | 76 | 77 |

*For Examiner's Use*

**(a) (i)** Plot the data to show the effect of temperature on the mean time for the milk to clear.



[4]

**(ii)** Describe **and** explain the effect of temperature on the time taken for the milk to clear.

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..... [4]

*For Examiner's Use*

**(b) (i)** Suggest **and** explain why each test was carried out three times.

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..... [2]

**(ii)** In this investigation, temperature was varied.

Suggest **and** explain **one** variable that needs to be controlled.

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..... [2]

[Total: 12]