



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**BIOLOGY**

**0610/63**

Paper 6 Alternative to Practical

**May/June 2011**

**1 hour**

Candidates answer on the Question Paper

Additional Materials: ruler

**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.

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 **9** printed pages and **3** blank pages.



1 Some students carried out tests for vitamin C.

They were provided with three vitamin C solutions, **S1**, **S2** and **S3**.

**S1** had a concentration of 0.2% vitamin C.

**S2** had a concentration of 0.05% vitamin C.

The concentration of **S3** was not known.

- The students measured 1 cm<sup>3</sup> of starch solution into a test-tube.
- They added 1 cm<sup>3</sup> of solution **S1**.
- The students added iodine solution, counting drop by drop, until a blue colour appeared. This was the end-point for solution **S1**.
- They repeated the test on solutions **S2** and **S3**.

These are the results that the students recorded.

|    |  |  |  |  |  |
|----|--|--|--|--|--|
| S1 |  |  |  |  |  |
| S2 |  |  |  |  |  |
| S3 |  |  |  |  |  |

← drops

(a) Record the students' observations in a suitable table using the space below.

[4]

(b) Use these results to suggest the approximate vitamin C concentration of **S3**.

Give reasons for your answer.

.....

.....

.....

.....

.....

..... [3]

(c) Suggest **four** ways in which you could improve this method to find the concentration of an unknown vitamin C solution.

1. ....

.....

2. ....

.....

3. ....

.....

4. ....

..... [4]

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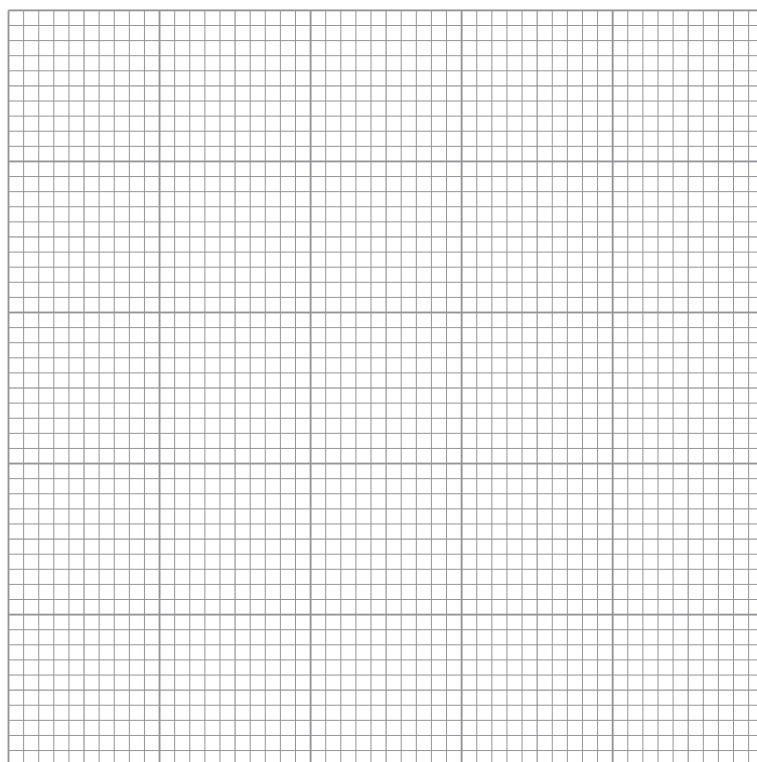
- (d) Fig. 1.1 shows the results of a similar investigation into the concentration of vitamin C in five fruit juices. The students counted the number of drops of iodine solution used to reach the end-point for each fruit juice.

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|                 |             |
|-----------------|-------------|
| Blackcurrant 48 | Pineapple 5 |
| Orange 16       | Lemon 12    |
| Strawberry 22   |             |

**Fig. 1.1**

- (i) On the grid below plot the data from Fig. 1.1 to show the variation in the number of drops of iodine solution required to reach the end-point.



[5]

- (ii) State which fruit juice has the highest concentration of vitamin C.

..... [1]

[Total: 17]

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**Question 2 begins on Page 6**

- 2 Fig. 2.1 shows a photograph of the larva of an insect.



Fig. 2.1

- (a) (i) In the space below make a large drawing of the larva shown in Fig. 2.1.

Labels are **not** needed.

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[5]

- (ii) Measure the length of the larva in Fig. 2.1 and in your drawing.

*length of larva in Fig. 2.1* .....

*length of larva in your drawing* ..... [2]

- (iii) Calculate the magnification of your drawing compared with the larva in Fig. 2.1.

Show your working.

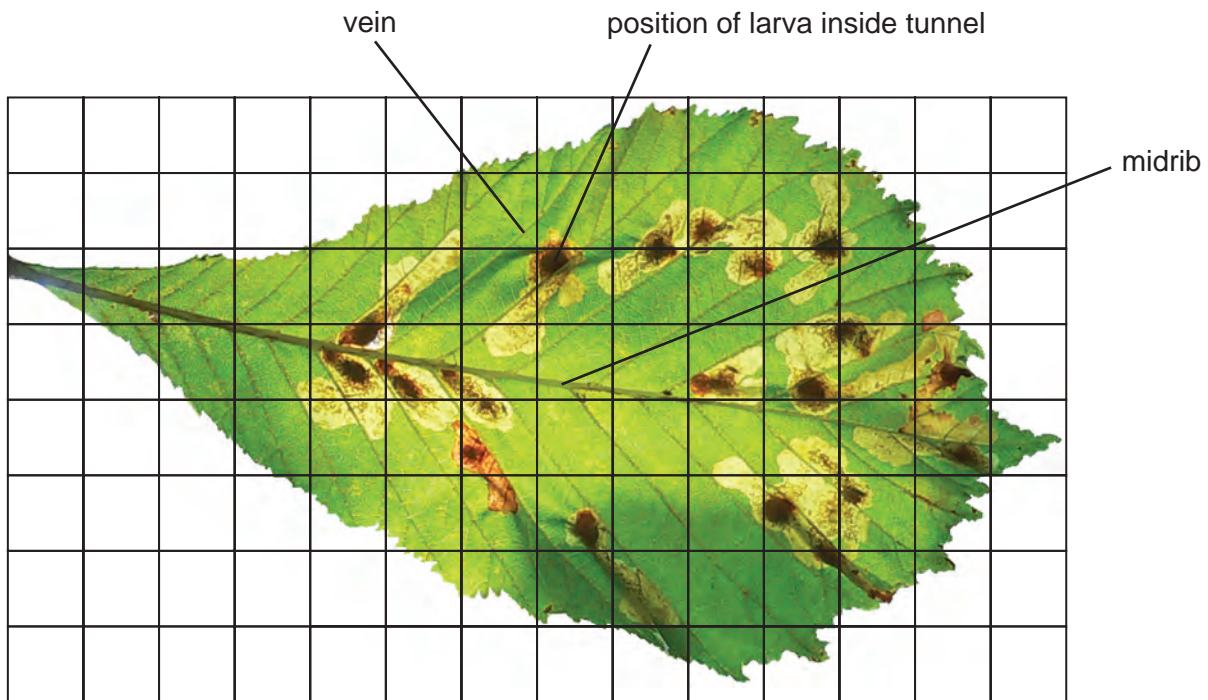
magnification ..... [2]

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- (b) The larva eats through leaf tissue making tunnels in which it lives.

Fig 2.2 shows part of a leaf that has been damaged by these tunnels.

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**Fig. 2.2**

- (i) Calculate the percentage of the leaf area which has been damaged by the tunnels.

Show your working.

answer .....% [3]

- (ii) Suggest and explain why the tunnels do not extend across the leaf midrib.

.....  
 .....  
 .....  
 ..... [2]



(iii) Suggest two reasons why the leaf in Fig. 2.2 may die and fall off.

1. ....  
.....
2. ....  
.....

[2]

(c) The larva in Fig. 2.1 becomes a moth.

Fig. 2.3 and Fig. 2.4 show the moth.



Fig. 2.3



Fig. 2.4

Look at Fig. 2.3 and Fig. 2.4.

(i) State **one** visible feature of this moth which is used to classify it as an arthropod.

..... [1]

(ii) State three visible features of this moth which are used to classify it as an insect.

1. ....
2. ....
3. ....

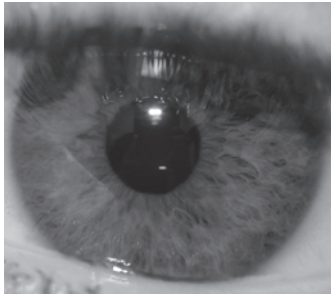
[3]

[Total: 20]

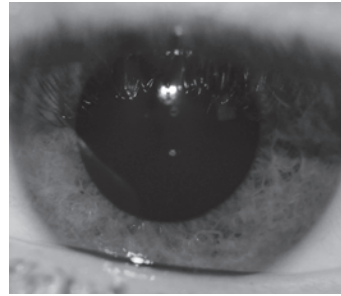
- 3 Fig. 3.1 shows two photographs of a person's eye.

In photograph **A** the person was looking out of a window.

In photograph **B** the person had turned away from the window.



**A**



**B**

**Fig 3.1**

- (a) Describe what happened to the diameter of the pupil in photograph **B**.

..... [1]

- (b) Explain your observation.

.....  
.....  
.....  
.....  
..... [2]

[Total: 3]

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