UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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| CANDIDATE NAME | |

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

*7896585537*

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

Paper 6 Alternative to Practical **May/June 2012**

**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 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.

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| 1 | |
| 2 | |
| 3 | |
| Total | |

This document consists of **9** printed pages and **3** blank pages.


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**1** Apple tissue changes colour in the air. Apple cells are thought to contain an enzyme which is a catalyst for the reaction:

$$\text{colourless compounds} + \text{oxygen in the air} \xrightarrow{\text{enzyme}} \text{coloured compounds}$$

Some students investigated this reaction.

The students cut a slice of apple with a knife as shown in Fig. 1.1.

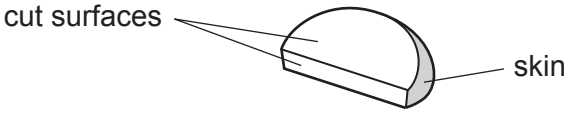


**Fig. 1.1**

This slice was broken into two pieces as shown in Fig. 1.2.

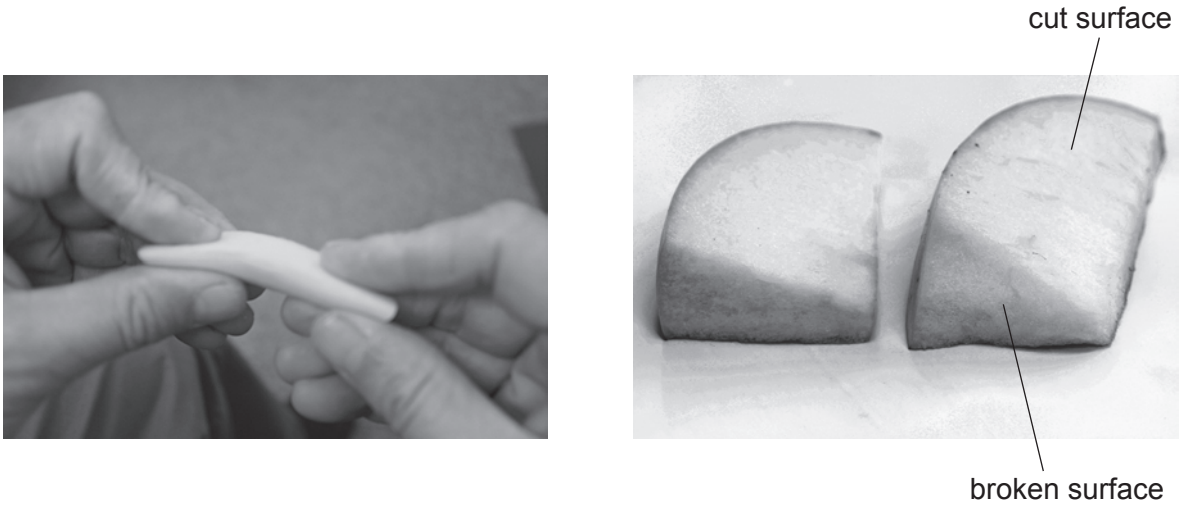


**Fig. 1.2**

Each piece was put into a different dish. The dishes were labelled **1** and **2**.

A few drops of water were put on the cut surface and the broken surface of the piece of apple in dish **1**.

A few drops of lemon juice were put on the cut surface and the broken surface of the piece of apple in dish **2**.

Every five minutes for 20 minutes the students observed the pieces of apple and recorded their observations in Table 1.1.

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**Table 1.1**

| time / minutes | dish **1**, apple with water | | dish **2**, apple with lemon juice | |
|---|---|---|---|---|
| | broken surface | cut surface | broken surface | cut surface |
| 5 | no change | very light brown | no change | no change |
| 10 | no change | light brown | no change | no change |
| 15 | very light brown | light brown with dark brown patches | no change | no change |
| 20 | light brown | dark brown | no change | no change |

The lemon juice was tested with litmus paper. It changed colour from blue to red.

**(a)** State the meaning of this colour change.

.....

..... [1]

**(b)** Look at Table 1.1. Describe the differences between the appearance of the **cut surfaces** in dish **1** and dish **2** during the experiment.

.....

..... [1]

**(c)** The colour changes are thought to involve enzyme activity.

**(i)** Explain how the observations in Table 1.1 and your description in **(b)** support this statement.

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..... [3]

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**(ii)** Using your knowledge of enzyme activity, describe another experiment that would test the idea that enzymes are involved in this colour change.

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..... [3]

**(d) (i)** Look at Table 1.1. Describe the differences between the appearance of the broken **surface** and the **cut surface** in dish **1** during the experiment.

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.....

.....

..... [2]

**(ii)** Cutting the apple with a knife damages cells, releasing the contents.

Suggest, from the observations in Table 1.1 and your description in **(d)(i)**, how **breaking** instead of cutting the apple may affect the cells.

.....

..... [1]

[Total: 11]

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**2** The animals labelled **A** and **B** in Fig. 2.1 are both arthropods.

**Fig. 2.1**

**(a)** Make a large labelled drawing of the **head** of arthropod **B**

[5]

**(b)** **A** and **B** belong to the same group of arthropods.

**(i)** Name this group

..... [1]

**(ii)** State two visible features of **A** and **B** which show that they belong to this group

1 .....

2 ..... [2]

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**(c)** Fig 2.2 shows a trap which can be used to catch other insects such as fruit flies.

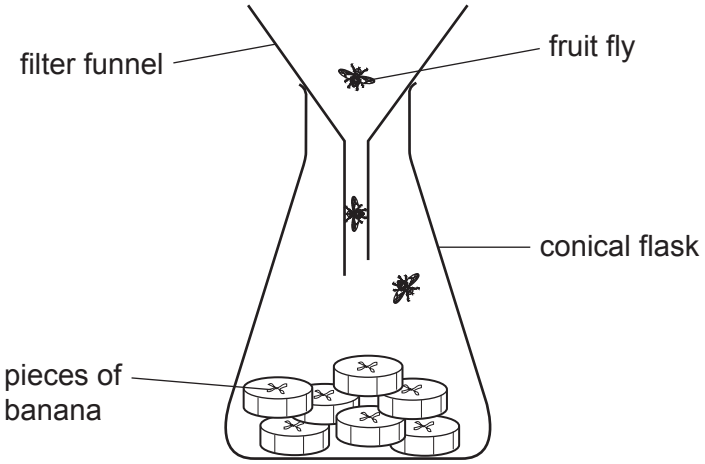


**Fig. 2.2**

**(i)** Fruit flies feed on fruits such as bananas. Bananas contain carbohydrates.

Describe how you could safely test a piece of banana for **two** different carbohydrates.

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..... [6]

**(ii)** Describe the observations expected if **these** two carbohydrates are present.

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..... [2]

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**(d)** Fig. 2.3 shows a banana and a similar fruit called a plantain.

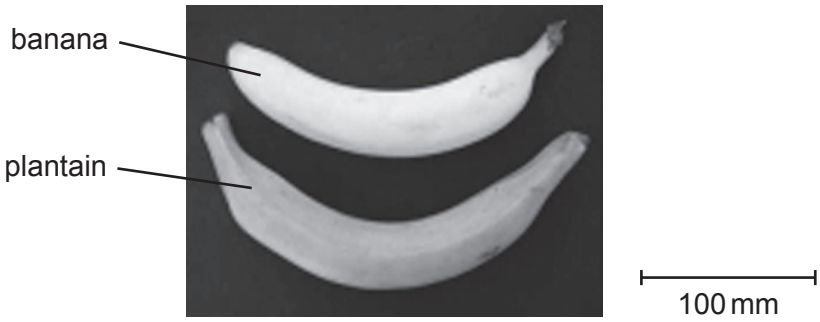


**Fig. 2.3**

Suggest an investigation to find out if fruit flies are more likely to feed on banana or plantain.

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..... [3]

[Total: 19]

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**3** Fig. 3.1 is a photograph of the flower of Amaryllis, *Hippeastrum aglaiae*.

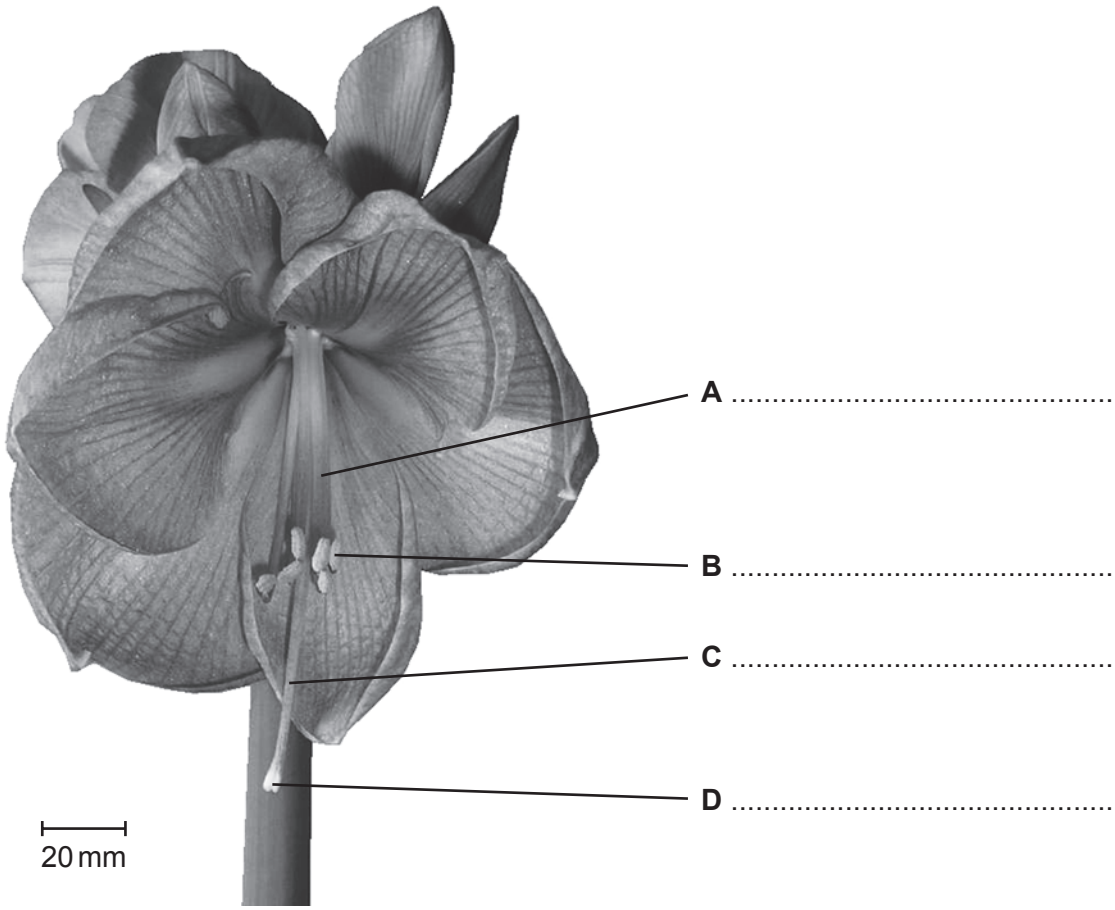


**Fig. 3.1**

**(a)** **(i)** On Fig.3.1, name the parts of the flower labelled **A**, **B**, **C** and **D**.

Write your answers on the lines in Fig.3.1 [4]

Plant breeders use small paint brushes to pollinate flowers of Amaryllis artificially.

**(ii)** State the letter of the part from which the pollen is taken.

..... [1]

**(iii)** State the letter of the part on which the pollen is put.

..... [1]

**(iv)** State one visible feature in Fig. 3.1 which shows that this flower is usually pollinated by insects.

.....

..... [1]

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Fig 3.2 shows four pollen grains from an Amaryllis flower.

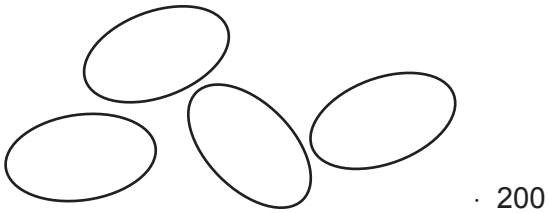


**Fig. 3.2**

**(b)** Measure the length of a pollen grain in mm.

Length of pollen grain ..... mm

Calculate the actual length of the pollen grain that you measured in mm.

Show your working.

actual length of pollen grain ..... mm [3]

[Total: 10]

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*Copyright Acknowledgements:*

| | |
|---|---|
| Question 2 Figure 2.1A Photograph | © *Drosophila melanogaster;* http://www.thekitchen.com. |
| Question 2 Figure 2.1B Photograph | © *Iridomyrmex purpureus;* http://en.wikipedia.org/wiki/Meat_ant. |
| Question 2d Figure 2.3 Photograph | © Banana and a plantain; http://www.grabemsnacks.com/what-is-a-plantain.html. |
| Question 3a Figure 3.1 Photograph | © Olive Ford © UCLES. |

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