



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**BIOLOGY**

**0610/51**

Paper 5 Practical Test

**May/June 2016**

CONFIDENTIAL INSTRUCTIONS



**Great care should be taken to ensure that any confidential information given does not reach the candidates either directly or indirectly.**

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If you have any problems or queries regarding these Confidential Instructions, please contact CIE  
by email [info@cie.org.uk](mailto:info@cie.org.uk)  
by phone +44 1223 553554  
by fax +44 1223 553558  
stating the Centre number, the nature of the query and the syllabus number quoted above.

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

**READ THESE INSTRUCTIONS FIRST**

These instructions give details of the apparatus required by each candidate for each experiment in this paper. A summary of the questions that will be presented to the candidates is included, where appropriate, to allow the biology teacher to test the apparatus appropriately. **Testing must be done out of sight of all candidates.**

**No access to the question paper is permitted in advance of the examination.**

Centres are reminded that candidates are expected to follow the instructions on the question paper and record all their results. They will not be penalised if these results are not what they expect.

The Supervisor should make sure the Supervisor's Report is fully completed and a copy is enclosed with each packet of scripts.

It is assumed that the ordinary apparatus of a science laboratory will be available, including a supply of purified water (distilled or deionised).

If arrangements are made for different sessions for different groups of candidates, care must be taken to ensure that the different groups of candidates are effectively isolated so that **no information passes between them.**

**All specimens should carry only the code letters and numbers as indicated and their identity should not be revealed to the candidates.**

Supervisors should ensure that all specimens have the correct identity attached to the specimen and that these are **not** removed during the examination.

If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Supervisor's Report.

Supervisors are advised to remind candidates that all substances in the examination should be treated with caution. Pipette fillers and eye protection should be used where necessary.

In accordance with COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

The following codes are used where relevant.

**C** = corrosive

**HH** = health hazard

**F** = flammable

**N** = hazardous to the aquatic environment

**MH** = moderate hazard

**T** = acutely toxic

**O** = oxidising

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination.

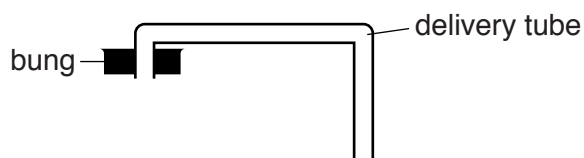
If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to resolve, it is essential for Centres to contact the Product Manager as soon as possible by **e-mail** to [info@cie.org.uk](mailto:info@cie.org.uk), by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

**Question 1**

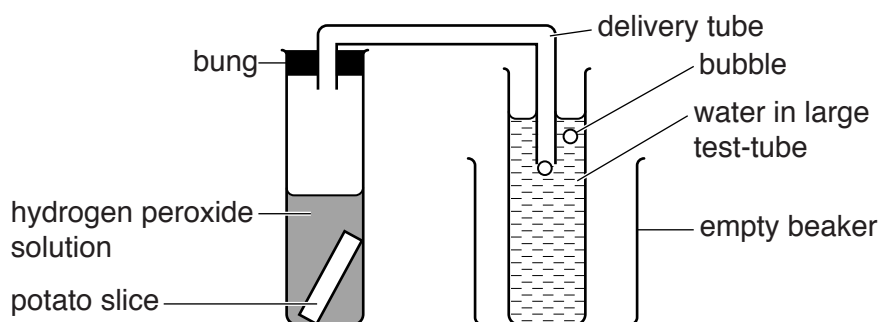
Each candidate should be provided with:

- (i) eye protection and gloves
- (ii) four identical test-tubes (approximately 15 mm × 150 mm), supported in a test-tube rack
- (iii) 50 cm<sup>3</sup> of 3% hydrogen peroxide solution in a beaker, labelled **hydrogen peroxide**
- (iv) means of measuring 10 cm<sup>3</sup>, e.g. measuring cylinder, syringe
- F, MH, HH** (v) piece of Irish potato, *Solanum tuberosum*, approximately 30 mm × 10 mm × 10 mm soaked in 20% ethanol for 24 hours, in a dish labelled **A**
- F, MH, HH** (vi) piece of Irish potato, *Solanum tuberosum*, approximately 30 mm × 10 mm × 10 mm soaked in 2% ethanol for 24 hours, in a dish labelled **B**
- (vii) means of cutting potato tissue, e.g. knife
- (viii) forceps (for handling potato)
- (ix) white tile (for cutting potato tissue)
- (x) large test-tube of water ( $\frac{3}{4}$  filled), standing in a 250 cm<sup>3</sup> beaker
- (xi) delivery tube made of standard glass tubing, in a rubber bung that fits tightly into the four test-tubes

The delivery tube should be long enough to reach 2–3 cm below the surface of the water in the large test-tube. Fig. 1.1 shows the delivery tube and bung as they should be presented to candidates. Fig. 1.2 shows how the candidates will set up the apparatus.



**Fig. 1.1**



**Fig. 1.2**

- (xii) ruler (with mm scale)
- (xiii) view of a clock or timer that allows the candidate to time seconds accurately
- (xiv) means of labelling test-tubes, e.g. marker pen, chinagraph pencil
- (xv) access to paper towels (in case of spillages)

## Solution Preparation

### 3% hydrogen peroxide solution

- Dilute stock solution (20 vol or 6%) using distilled or deionised water.
- Add 500 cm<sup>3</sup> distilled water to 500 cm<sup>3</sup> stock (6%) hydrogen peroxide solution to make 1 dm<sup>3</sup>. This is sufficient for 20 candidates.

Stock solution should be **newly bought** and stored in a cool, dark place.

The diluted solution can be made the day before the examination and stored in a sealed container in a cool, dark place. It should be allowed to reach room temperature before the examination.

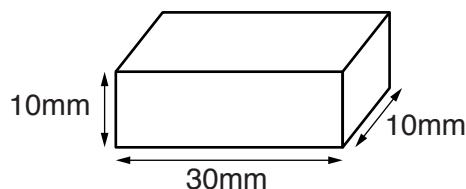
### Ethanol solutions

These can be made from standard bench reagent, which is usually 70%. High quality ethanol is not required. It is not necessary to use absolute alcohol. Alcohol used for spirit lamps is not suitable.

- To make 2% ethanol, add 3 cm<sup>3</sup> of 70% ethanol to 97 cm<sup>3</sup> distilled or deionised water.
- To make 20% ethanol, add 30 cm<sup>3</sup> of 70% ethanol to 70 cm<sup>3</sup> distilled or deionised water.

## Preparation of Potato

Irish potato, *Solanum tuberosum*, should be cut into lengths approximately 30 mm long, 10 mm wide and 10 mm thick, as shown in Fig. 1.3.



**Fig. 1.3**

The potato pieces should be soaked in the two concentrations of ethanol for 24 hours prior to the examination. It is recommended that the containers are covered during the soaking time.

About 30 minutes before the examination, the potato pieces can be placed in the appropriately labelled dishes and covered with damp paper.

dish **A** – one piece of potato soaked in 20% ethanol

dish **B** – one piece of potato soaked in 2% ethanol

Before the examination, the Supervisor should check that the potato pieces soaked in ethanol (2% and 20%) produce bubbles when placed in 3% hydrogen peroxide solution. The results should be noticeably different for the two ethanol concentrations. If the numbers of bubbles are not noticeably different, re-trial by changing the potato. This trialling should be done at least a week in advance of the examination to enable suitable potato tissue to be identified.

The Supervisor (**not** the Invigilator) should carry out the practical aspects of **Question 1** and record their results in the space in the Supervisor's Report. This must be done during the examination, using the same apparatus and reagents as the candidates but out of sight of the candidates.

**Question 2**

Each candidate should be provided with:

- (i) one ruler (with mm scale)

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**This form should be completed and returned to CIE with the scripts.**

### REPORT ON PRACTICAL BIOLOGY

*The Supervisor or Teacher responsible for the subject should provide the following information.*

- 1** Was any difficulty experienced in providing the necessary materials? If so, give brief details.

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- 2** Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

**(a)** difficulties with specimens or materials;

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**(b)** accidents to apparatus or materials;

.....

**(c)** assistance provided in the case of colour-blindness;

.....

**(d)** any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

.....

Other cases of individual hardship, e.g. illness or disability, should be reported direct to CIE on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

- 3** During the examination, the Supervisor should, **out of sight of the candidates**, carry out the practical aspects of **Question 1** using the same apparatus and reagents as the candidates. Results should be recorded in the space on page **8** (**not** on a spare question paper). Attach extra sheets if necessary.

The Invigilator should **not** carry out **Question 1**.



- 4 A plan of work benches, giving details of the candidate numbers of the places occupied by the candidates for each session, must be enclosed with the scripts.

**Declaration** (to be signed by the Principal or the Examinations Officer)

The preparation of this practical has been carried out so as to maintain fully the security of the examination.

Signed .....

Name (IN BLOCK CAPITALS) .....

Centre number .....

Centre name .....

If scripts are required to be dispatched in more than one packet, it is essential that a copy of the Supervisor's Report and the appropriate seating plan(s) are inside **each packet**.