



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**BIOLOGY**

**5090/31**

Paper 3 Practical Test

**October/November 2011**

CONFIDENTIAL INSTRUCTIONS

**1 hour 15 minutes**

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



If you have any problems or queries regarding these Instructions, please contact CIE  
by e-mail: [International@cie.org.uk](mailto:International@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.

This document consists of **6** printed pages and **2** blank pages.



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

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.

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.**

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Pipette fillers and safety goggles 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 in the left margin where relevant.

**C** = corrosive substance

**F** = highly flammable substance

**H** = harmful or irritating substance

**O** = oxidising substance

**T** = toxic substance

**Instructions to Supervisors**

*Each candidate must be supplied with:*

**For question 1**

- (i) A *fresh* green leaf in a dish, labelled **D1**.
- (ii) A disc of fresh leaf tissue, presented in a small dish of 50% ethanol, labelled **D2**. The disc should be at least 15 mm in diameter and have been taken from the leaf of a plant that has been exposed to bright light for some days before the disc was cut from it. The leaf must be colourless, having been decolourised in ethanol (IMS) by dipping the leaf in ethanol contained in a small beaker which is suspended in a hot water bath at 80 °C. This should be done prior to carrying out the starch test.

Test before the examination.

- (iii) A disc of fresh leaf tissue labelled **D3**. The disc should be at least 15 mm in diameter. This leaf should have been taken from a plant that has been kept in complete darkness for 72 hours before sampling and decolourising as above.

Discs **D2** and **D3** should be cut from green (not variegated) leaves, and be cut from the lamina so that it does not include midrib. The discs should be the same size and can be cut using a cork borer of diameter 15 mm or more. Both discs must be from plants of the same species. Any suitable local species may be used, such as *Hibiscus*, *Hedera*, young papaya, young mango leaves, etc.

However, the plant must

- be terrestrial (not aquatic)
- be green (not variegated)
- be without waxy or tough leaves
- be able to produce bubbles when a leaf is placed in hot water
- contain broad enough leaves to cut samples that do not have midrib
- **be able to be decolourised by ethanol**

- (iv) A beaker of hot water (at least 80 °C).
- (v) Forceps.
- (vi) Iodine in KI solution, with pipette dispenser. Labelled 'iodine solution'.
- (vii) White tile.
- (viii) Paper towels.

**For question 2**

- (i) A slice of water melon flesh at least 4 cm × 4 cm × 4 cm, labelled **D4** for each candidate. Additional spare samples of water melon flesh should be made available to candidates, if required. The fruit should be fully ripe and freshly cut.
- (ii) Scalpel or sharp knife.
- (iii) White tile. (Can be the one used in question 1, if washed).
- (iv) Small beaker.
- (v) Two test-tubes with means of labelling them.
- (vi) Spatula or spoon.
- (vii) Benedict's solution with pipette dispenser.
- (viii) 10 cm<sup>3</sup> of 0.1% glucose solution in a small beaker, labelled glucose solution. This can be made by dissolving 1 g glucose in 1000 cm<sup>3</sup> of water.
- (ix) Water bath, with heater, for reducing sugar test.
- (x) Test-tube rack, or similar support.
- (xi) Ruler, mm.

**For question 3**

- (i) Specimen labelled **D5** – an entire achene or seed which bears a pappus (parachute) for wind dispersal. The specimen should, if possible, have an interesting structure, visible with a lens, such as branched hairs in the pappus or ribs on the body of the achene.
- (ii) Hand lens.



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- 5 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. The space below can be used for this, or it may be on separate paper.

**Declaration** (to be signed by the Principal)

The preparation of this practical examination 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 by CIE to be despatched in more than one envelope, it is essential that a copy of the relevant Supervisor's report and the appropriate seating plan(s) are sent inside **each envelope**.

