



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education  
Advanced Subsidiary Level and Advanced Level

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**BIOLOGY**

**9700/35**

Advanced Practical Skills 1

**May/June 2011**

**CONFIDENTIAL INSTRUCTIONS**

**Great care should be taken to ensure that any confidential information given, including the identity of material on microscope slides where appropriate, does not reach the candidates either directly or indirectly.**

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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.

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This document consists of **8** printed pages.



### Instructions for preparing apparatus

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.** 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.

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.

Candidates must be provided with a microscope with:

- Low-power objective lens, e.g.  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
- High-power objective lens, e.g.  $\times 40$  (equal to 4 mm or  $\frac{1}{6}$ " )
- Eyepiece graticule fitted within the eyepiece and visible in focus at the same time as the specimen.

Each candidate must have sole, uninterrupted, use of the microscope for at least 55 minutes.

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 the 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 substance

**H** = harmful or irritating substance

**T** = toxic substance

**F** = highly flammable substance

**O** = oxidising substance

**N** = harmful to environment

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres are also referred to the Handbook for Centres, and in particular Section 3.1.2 (c) (i), Security of Question Papers and Examination Materials, as well as 3.3.11.1, Practical Examinations in Science Subjects.

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 [international@cie.org.uk](mailto:international@cie.org.uk), by fax to +44 1223 553558 or by phone to +44 1223 553554.

### Confidential Instructions

Each candidate should have a **mm ruler** for use in both questions.

Each candidate will require

### Question 1

**Fresh E, W, P and water for washing both plant material and apparatus are needed for each candidate.**

**More of the solutions should be available if requested by candidates.**

**Solutions and reagents provided to the candidates should be supplied in a suitable beaker, or container, for removal of the solution using a syringe.**

Summary of solutions and reagents

labelled	contents	hazard	concentration / %	volume / cm <sup>3</sup>
<b>E</b>	ethanol	[F] flammable	25	at least 40
<b>W</b>	distilled water	none	–	at least 100

labelled	contents	hazard	details	quantity
<b>P</b>	plant tissue	none	see instructions	3
<b>methylene blue</b>	used to stain plant tissue	stains	0.01	–

**It is advisable to wear safety glasses/goggles when handling chemicals.**

Preparation of solutions and reagents

- [F] (i) **E**, at least 40 cm<sup>3</sup> of 25.0% ethanol in a beaker or container with a suitable cover to prevent evaporation, labelled **E**.

This is made by taking 25 cm<sup>3</sup> of 99% ethanol and making it up to 100 cm<sup>3</sup> with distilled water. The actual concentration of the ethanol is 25% but the concentration is intentionally stated on the examination paper as 10%.

- (ii) **W**, at least 100 cm<sup>3</sup> of distilled water in a beaker or container, labelled **W**.
- (iii) **P**, three pieces of plant tissue in a beaker or container, with enough tap water to cover the plant tissue, labelled **P**.

**Plant tissue must be prepared the day before the examination.**

Suitable plant tissue is white potato (e.g. Irish) or sweet potato or cassava.

The plant tissue should be as fresh as possible. The plant tissue should not have been stored or refrigerated for a long period of time.

The outer skin should be removed.

Each piece should have the same cross-sectional area, 0.5 cm × 0.5 cm and be at least 5 cm in length.

Slices of plant tissue can be cut with a large kitchen knife and strips produced using a scalpel. Please do not use cork borers as this may compress the tissues.

The test-tubes provided must be large enough to allow the pieces to fit.

Put the prepared plant tissue into a shallow tray so that the pieces do not overlap and cover with 0.01% methylene blue solution.

This is prepared by dissolving 0.1 g of methylene blue in 80 cm<sup>3</sup> of distilled water in a beaker or container and making up to 100 cm<sup>3</sup> with distilled water. This makes 0.1% methylene blue solution.

Put 10 cm<sup>3</sup> of this 0.1% methylene blue solution into a beaker or container and make up to 100 cm<sup>3</sup> with distilled water. This makes 0.01% methylene blue solution.

**If any methylene blue comes into contact with your skin wash off immediately with water.**

Before the examination wash the pieces of plant tissue and put them into a beaker or container with tap water. Rinse the plant tissue by pouring out the water and then adding fresh tap water. Repeat four times. Add enough tap water to cover the plant tissue ready to put out for the candidate in a container, labelled **P**.

Apparatus for each candidate

Apparatus	Quantity	✓
10 cm <sup>3</sup> syringes or one with the means to wash it out	2	
Container with tap water, labelled <b>For washing plant tissue</b>	1	
Container with tap water, labelled <b>For washing apparatus</b>	1	
Container, labelled <b>For waste</b>	1	
Paper towels	4	
Beakers or containers, to hold 20 cm <sup>3</sup>	5	
Test-tubes	6	
Bung or cork to fit test-tubes	1	
Test-tube rack or container to hold 6 test-tubes	1	
Ruler, mm	1	
White tile or cutting board	1	
Scalpel or sharp blade	1	
Blunt forceps	1	
Stop clock, stop watch or sight of a clock with a second hand	1	
Glass marker pen	1	
Safety goggles/glasses	1	

During the examination, the Supervisor should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and reagents as the candidates. These results should be written in the Supervisor's report (**not** on a spare Question paper) which should be enclosed with the candidates' scripts. Please ensure that if the scripts are in several packets that a copy of the Supervisor's report is enclosed with each packet of scripts. The Invigilator should **not** carry out **Question 1**.

## Question 2

Summary of solutions and reagents

labelled	contents	hazard	concentration / %	volume / cm <sup>3</sup>
iodine	iodine in potassium iodide solution	[H] irritant	–	at least 25

labelled	contents	hazard	details	quantity
banana	banana	none	green/unripe (ripe bananas are not suitable)	One 2 cm to 3 cm slice wrapped in a damp paper towel. See instructions.

- [H] (i) **Iodine**, iodine in potassium iodide solution in a bottle or container, with a pipette (teat), labelled **iodine**.
- (ii) Just **before** the start of **Question 2**, the Invigilator cuts the unpeeled banana, across its width, into at least 2cm width slices and puts one slice onto a damp paper towel for each candidate.

Apparatus for each candidate

Apparatus	Quantity	✓
clean microscope slides	2	
glass cover slips e.g. 2 cm × 1 cm	2	
mounted needle or seeker or other means to position cover slip on slide	1	
white tile	1	
container, labelled <b>For waste</b>	1	
paper towels	2	
Microscope with: <ul style="list-style-type: none"> <li>• Low-power objective lens, e.g. × 10 (equal to 16 mm or <math>\frac{2}{3}</math>" )</li> <li>• High-power objective lens, e.g. × 40 (equal to 4 mm or <math>\frac{1}{6}</math>" )</li> <li>• Eyepiece graticule (supplied by Cambridge) fitted within the eyepiece and visible in focus at the same time as the specimen or the eyepiece graticule provided by the Centre. Centres are advised to keep these for future use as they will not be supplied in 2012.</li> </ul>	1	

Each candidate must have sole, uninterrupted use of the microscope for 55 minutes.

**MATERIALS TO BE SUPPLIED BY CAMBRIDGE**

- (i) Question papers
- (ii) Eyepiece graticule – if the Centre has its own eyepiece graticules these can be used.

**note:** no slide is required.

**RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE**

**There is no material to return to Cambridge.**

**REPORT FORM**

The teacher responsible for the examination is asked to fill in the Report Form in these Confidential Instructions. For Centres where more than one script package is used, there must be a copy of the completed Report Form in each script package.

These report forms are vital in order to allow the examiners to assess all candidates as fairly as possible and should always be completed by every Centre.

A copy of the seating plan for the examination room must also be enclosed in each script package.

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**This form should be completed and sent to the Examiner with the scripts.**

**REPORT ON PRACTICAL BIOLOGY**

**A Level**

**May/June Session 2011**

*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.
  
2. Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:
  - (a) difficulties arising from faulty specimens or microscopes;
  - (b) accidents to apparatus or materials;
  - (c) assistance provided in case of colour-blindness;
  - (d) any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

All 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 Part 6 of the Handbook for Centres.

3. During the examination, the Supervisor should, **out of sight of the candidates**, carry out **Question 1**, using the same solutions and reagents as the candidates. These **results** should be written in the Supervisor's report which should be enclosed with the candidates' scripts. If the scripts are in several packets, please ensure that a copy of the Supervisor's report is enclosed with each packet of scripts. The invigilator should **not** carry out **Question 1**.



*Results for Question 1:*

- 4. Enclose a plan of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for each session on a separate piece of 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 (of enclosed scripts).....

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**.

