



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

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**BIOLOGY**

**9700/34**

Advanced Practical Skills 2

**May/June 2012**

**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 **7** printed pages and **1** blank page.



### 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:

- Eyepiece lens,  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
- Low-power objective lens,  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
- High-power objective lens,  $\times 40$  (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.

To avoid confusion, CIE request that only the lenses specified above are fitted in the microscopes used in the examination. Any lenses which are **not**  $\times 10$  or  $\times 40$  should be removed or replaced.

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.

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 **H**, **W** and **P** 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	percentage concentration	volume /cm <sup>3</sup>
<b>H</b>	hydrogen peroxide solution	[H] harmful irritant	1.5	at least 100
<b>W</b>	distilled water	none	–	at least 80
<b>P</b>	plant extract solution	none	–	at least 50

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

Preparation of solutions and reagents:

- [H] (i) **H**, at least 100 cm<sup>3</sup> of 1.5% (5 volumes) hydrogen peroxide solution in a beaker or container, labelled **H**.  
The beaker or container should allow the hydrogen peroxide solution to be poured easily into a test-tube.

**H** must be put out immediately before the examination and kept covered.

**It was found using this concentration that suitable results were obtained, see below.**

The concentration can be obtained by putting 25 cm<sup>3</sup> of 6% (20 volumes) hydrogen peroxide solution in a beaker or container and making up to 100 cm<sup>3</sup> with distilled water.

This is sufficient for 1 candidate.

- (ii) **W**, at least 80 cm<sup>3</sup> of distilled water in a beaker or container, labelled **W**.
- (iii) **P**, at least 50 cm<sup>3</sup> of plant extract solution, in a beaker or container, labelled **P**.

The plant extract can be prepared using 45 g of peeled cassava or peeled sweet potato or peeled white potato (for example Irish). Cut the plant material into small pieces and then grind in a pestle and mortar or liquidise with 75 cm<sup>3</sup> of water. Strain the mixture through a fine sieve and retain the liquid plant extract. This should produce approximately 60 cm<sup>3</sup> of plant extract solution. **Test P as described on page 4.**

The activity of the plant extract solution should be tested before the examination by putting a 1 cm × 1 cm piece of filter paper into the extract. Fill a large test-tube with the hydrogen peroxide solution to within 2 cm of the top. Drop the square of filter paper into the hydrogen peroxide solution. Start timing and record when the square returns to the surface.

The time should be between 10 and 40 seconds. If it is too fast, decrease the concentration of the plant extract by diluting the extract. If it is too slow, increase the mass of plant material used for the extract.

All solutions and reagents should be disposed of according to local safety regulations.

Apparatus for each candidate:

Apparatus	Quantity	✓
Filter paper, sufficient for the candidate to cut at least 50 squares (1 cm × 1 cm) – in a shallow container	1	
Scissors for cutting paper	1	
Ruler mm	1	
10 cm <sup>3</sup> syringe (note: needles are <b>not</b> required and should <b>not</b> be given to candidates)	2	
2 cm <sup>3</sup> or 5 cm <sup>3</sup> syringe (note: needles are <b>not</b> required and should <b>not</b> be given to candidates)	1	
Large test-tube	1	
Test-tube rack or container to hold large test-tubes	1	
Container with tap water, labelled <b>For washing</b>	1	
Container, labelled <b>For waste</b>	1	
Blunt forceps	1	
Mounted needle or seeker	1	
Paper towels	8	
Beakers or containers to hold 20 cm <sup>3</sup> volume	6	
Stopclock, stopwatch 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**

- (i) Slide **K1** (supplied by Cambridge)
- (ii) Microscope with:
- Eyepiece lens,  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
  - Low-power objective lens,  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
  - High-power objective lens,  $\times 40$  (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.

On receipt of the slides, please check that they are labelled **K1** and that all the slides are intact. The identity of material on the slides is **confidential** and must **not** be disclosed to candidates.

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

The number of slides supplied by Cambridge will be equal to half the candidate entry. Therefore, half of the candidates should start on **Question 1** and the other half should start on **Question 2**.

**MATERIALS TO BE SUPPLIED BY CAMBRIDGE**

- (i) Question Papers
- (ii) Slide **K1**

**RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE**

**Immediately after the examination** the microscope slides **must** be:

- returned to Cambridge in the containers in which they were received, using the self-adhesive label. They must **not** be included in the package of scripts.
- Or
- purchased using the order form enclosed with the slides, which should be completed and returned to Cambridge. This must **not** be included in the package of scripts.

Slides and boxes will be charged at the rate of £3 per slide and £1 per box.

If the items are not returned or purchased by the deadline stated on the order form they will be charged at £3.50 per slide plus £1 per box.

**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 2012**

*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 of **Question 1**:

Temperature of examination room ..... °C

- 4. Enclose a plan of work benches with the scripts, giving details of the candidate numbers for 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 (for 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**.

