Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/33**

Advanced Practical Skills 1 **February/March 2016**

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.

4157736525

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: 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.

This document consists of **10** printed pages and **2** blank pages.

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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.**

Candidates must be provided with a microscope with:

- eyepiece lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- low-power objective lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- high-power objective lens, ×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.

To avoid confusion, Cambridge requests that only the lenses specified above are fitted in the microscopes to be used in the examination. Any lenses which are **not** ×10 or ×40 should be removed or replaced.

Each candidate must have sole, uninterrupted use of the microscope for at least one hour.

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

HH = health hazard

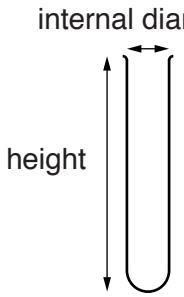
F = flammable

N = hazardous to the aquatic environment

MH = moderate hazard

T = acutely toxic

O = oxidising



When small test-tubes are provided, it is expected that these are approximately 150 mm in height.

If other dimensions of apparatus are required, these will be specified.

Centres are reminded that they are **not** permitted to open the Question Paper envelopes before the examination. Centres should also refer 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 info@cie.org.uk, by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

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Confidential Instructions

In advance of the examination:
prepare the pieces of onion tissue required for Question 2, as instructed on pages 6 and 7.

For both Questions

Each candidate will require:

- ruler, marked in mm
- clean and dry apparatus, e.g. glassware and syringes (without a needle)
- solutions supplied in suitable beakers or containers for removal of the solutions using syringes
- fresh solutions, materials and rinsing water, where appropriate.

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

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.

Solutions should be disposed of in accordance with local safety regulations.

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Question 1

Each candidate will require:

apparatus and solutions for each candidate	quantity	✓
0.8% albumen solution in a beaker or container, labelled **P**, provided at room temperature (see *Preparation of solutions*). This is not the same concentration as the concentration stated on the Question Paper.	at least 25 cm^3	
0.2% albumen solution in a beaker or container, labelled **U**, provided at room temperature (see *Preparation of solutions*)	at least 10 cm^3	
Distilled water in a beaker or container, labelled **W**, provided at room temperature	at least 25 cm^3	
5.0% potassium hydroxide solution **[MH][C]** in a beaker or container, labelled **K**, provided at room temperature (see *Preparation of solutions*)	at least 15 cm^3	
0.3% copper sulfate solution in a beaker or container, labelled **C**, provided at room temperature (see *Preparation of solutions*)	at least 15 cm^3	
5 cm^3 syringe with the means to wash it out	1	
2 cm^3 or 3 cm^3 syringes with the means to wash them out	2	
2 cm^3 or 3 cm^3 syringe, labelled **C** (for use with copper sulfate solution)	1	
Beakers or containers, to hold a volume of up to 100 cm^3	6	
Test-tubes, small	7	
Test-tube rack(s) or container to hold seven test-tubes or test-tube rack to hold five test-tubes with container to hold two test-tubes	1	
Glass rod	1	
White card or white paper or white tile, approximately 10 cm by 10 cm	1	
Container with tap water (approximately 200 cm^3), labelled **For washing**	1	
Container (approximately 200 cm^3 volume), labelled **For waste**	1	
Paper towels	8	
Glass marker pen	1	
Suitable eye protection	1	

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It is advisable to wear suitable eye protection when handling chemicals.

Preparation of solutions

Solutions can be prepared the day before the examination and kept in a covered container, in a refrigerator. The solutions must be provided to candidates at room temperature.

(i) **P**, 0.8% albumen solution

This is prepared by dissolving 1.6 g of albumen in 20 cm^3 of distilled water and mixing well. Make up to 200 cm^3 with distilled water and stir until dissolved.

(Note: this is **not** the concentration stated on the Question Paper.)

(ii) **U**, 0.2% albumen solution

This is prepared by putting 50 cm^3 of the 0.8% albumen solution into a beaker and making up to 200 cm^3 with distilled water.

[MH][C] (iii) **K**, 5.0% potassium hydroxide solution

You are advised to wear suitable eye protection and gloves when preparing the potassium hydroxide solution, **K**. If potassium hydroxide solution, **K**, comes into contact with your skin, then wash off with cold water.

This is prepared by dissolving 5.0 g of potassium hydroxide in 80 cm^3 of distilled water and making up to 100 cm^3 with distilled water.

(iv) **C**, 0.3% copper sulfate solution

You must **not** use anhydrous copper sulfate.

This is prepared by dissolving 0.3 g of copper(II) sulfate pentahydrate ($CuSO_4.5H_2O$) in 80 cm^3 of distilled water and making up to 100 cm^3 with distilled water.

This gives a very pale blue solution.

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Question 2

Each candidate will require:

materials, apparatus and solutions for each candidate	quantity	✓
Piece of onion covered by 10% sodium chloride solution in a beaker or container, labelled **S1**. The piece of onion must be set up the day before the examination to pre-soak.	1	
Piece of onion covered by distilled water in a beaker or container, labelled **S2**. The piece of onion must be set up the day before the examination to pre-soak.	1	
Microscope slides and coverslips	2	
Forceps (blunt)	1	
Scalpel or sharp blade	1	
Seeker or mounted needle	1	
Pipette, plastic or glass, with teat	1	
White tile or surface for cutting	1	
Glass marker pen	1	
Paper towels	8	

Preparation of pieces of onion and solution

(i) **S1**, 10% sodium chloride solution

This is prepared by dissolving 10 g of sodium chloride in 80 cm^3 of distilled water and making up to 100 cm^3 with distilled water.

(ii) Pieces of onion

- Candidates should **not** be given red onion. Onions with white flesh should be used, either with dry brown scales (yellow onion) or with dry white scales (white onion).
- The onions must be as fresh as possible to avoid the effects of storage.
- The pieces of onion must be prepared the day before the examination and left in **S1** (10% sodium chloride solution) and **S2** (distilled water), with the containers covered to prevent evaporation.

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Cut the onion pieces as shown in Fig. 2.1.

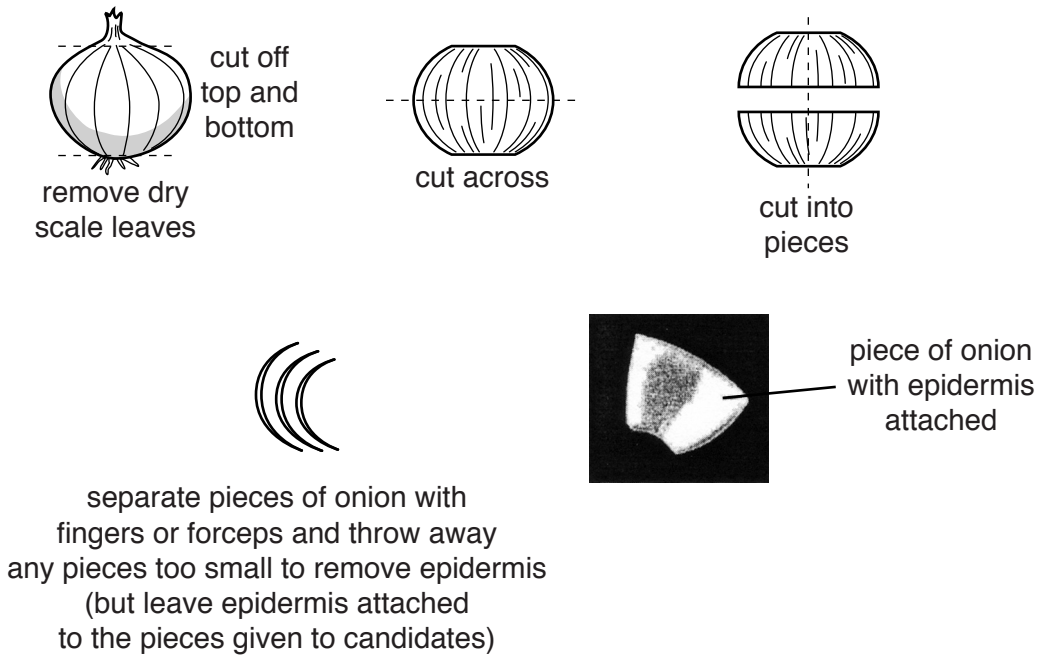


Fig. 2.1

Place the number of pieces of onion required for all candidates, with some spares, into large containers with enough of each solution (**S1** or **S2**) to submerge the onion pieces. Cover the containers and keep in a refrigerator or cool place.

Before the examination, ensure that solutions containing the piece of onion for each candidate are at room temperature.

(iii) Microscope (as described on page 2)

For each candidate:
- the microscope **must** be set up on low power
- **no** slide must be left on the stage of the microscope.

SUPERVISOR'S REPORT

The Supervisor's Report is essential in order to allow the Examiners to assess all candidates as fairly as possible and should always be completed by every Centre.

During the examination, the Supervisor or other competent biologist (not the Invigilator) should follow the steps in **Question 1** in order to obtain results for **1(b)(iii)** and **1(b)(iv)**.

The Supervisor should use the same solutions as those provided to the candidates and work **out of the sight of the candidates**.

These results should be written in the Supervisor's Report, **not** on a spare Question Paper.

SEATING PLAN

Provide a **seating plan** of work benches, on separate paper, giving details of the places occupied by the candidates for **each question** using each candidate's number.

The Supervisor's Report and the candidates' seating plan should be enclosed with each packet of scripts.

NO MATERIALS TO BE SUPPLIED BY CAMBRIDGE

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

There are no materials to return to Cambridge.

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This form should be completed and sent with the scripts.

SUPERVISOR'S REPORT

March 2016

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 Cambridge on the 'Special Consideration Form' as detailed in the Handbook for Centres.

3 During the examination, the Supervisor or a competent biologist (not the Invigilator) should follow the steps in **Question 1** in order to obtain results for **1(b)(iii)** and **1(b)(iv)**. The Supervisor should use the same solutions as those provided to the candidates and work **out of the sight of the candidates**. These results should be written on page 12, 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.

4 Enclose a **seating plan** of work benches with the scripts, giving details of the candidate numbers for the places occupied by the candidates for **each question**.

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

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

Signed .....

Name (in block capitals) .....

Centre number (of enclosed scripts) .....

Centre name .....

If scripts are despatched in more than one envelope, it is essential that **each envelope** includes a copy of the:

- relevant Supervisor's Report
- appropriate seating plan(s).

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Temperature of examination room .....°C

Results for **Question 1(b)(iii)** and **1(b)(iv)**

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