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**BIOLOGY**

**9700/31**

Advanced Practical Skills 1

**October/November 2015**

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: 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 **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.**

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.

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

Each candidate must have 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 substance

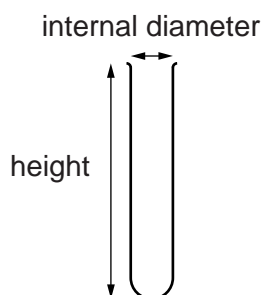
**H** = harmful or irritating substance

**T** = toxic substance

**F** = highly flammable substance

**O** = oxidising substance

**N** = harmful to environment



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 in the Apparatus list.

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

**Confidential Instructions**

**No access to the Question Paper is permitted in advance of the examination.**

Each candidate will require:

**For both Questions:**

- mm ruler.

**Question 1**

- Solutions and materials provided to the candidates should be supplied in a suitable beaker, or container, for removal of the solution using a syringe. More of the solutions and materials should be available if requested by candidates.
- All solutions should be provided to candidates at **room temperature**.
- Clean, dry test-tubes and syringes are needed for each candidate.
- Fresh **S, W, P, tap water** and **washing water** are needed for each candidate.
- All solutions should be disposed of according to local safety regulations.

Plant tissue must be prepared the day before the examination

Summary of solutions and materials:

labelled	contents	hazard	volume /cm <sup>3</sup>
<b>S</b>	10% sodium chloride solution	none	at least 50
<b>W</b>	distilled water	none	at least 200

Materials:

labelled	contents	hazard	details	quantity
<b>P</b>	plant tissue stained with methylene blue solution	none	see instructions	5
<b>methylene blue</b>	0.1% methylene blue solution used to stain plant tissue	stains	–	–

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

Preparation of solutions and materials:

- (i) **S**, at least 50 cm<sup>3</sup> of 10% sodium chloride solution, in a beaker or container, labelled **S**.

This is prepared by dissolving 10g of sodium chloride in 100 cm<sup>3</sup> of distilled water in a beaker or container and stirring well.

This may be prepared the day before but should be kept in covered containers in a refrigerator. However, **S** should be supplied to candidates at **room temperature** for the examination.

- (ii) **W**, at least 200 cm<sup>3</sup> of distilled water in a beaker or container, labelled **W**.
- (iii) **P**, five pieces of plant tissue, in water, in a beaker or container with a suitable cover to prevent evaporation, labelled **P**.

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

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

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 before cutting the plant tissue into pieces.

Each piece should have the same cross-sectional area, 0.5 cm × 0.5 cm.  
Length should be between 3–4 cm.

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 of plant tissue to fit.

Put the prepared plant tissue into a shallow tray so that the pieces do not overlap and cover them with **freshly** prepared 0.1% 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.

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

Before the examination wash the pieces of plant tissue as follows:

- pour off the methylene blue solution
- add tap water to cover the pieces
- pour off the water and then add fresh tap water
- repeat four times.

Add enough fresh tap water to cover the plant tissue ready to put out for the candidate in a beaker or container, labelled **P**. The tap water in **P** may still be blue.

Cover the beaker or container **P** to prevent evaporation.

Apparatus for each candidate should be clean.

Syringe needles are **not** required and must **not** be given to candidates.

Apparatus for each candidate	Quantity	✓
10 cm <sup>3</sup> syringe, with the means to wash it out	2	
Beaker or container (capacity approximately 200 cm <sup>3</sup> ), containing approximately 150 cm <sup>3</sup> tap water, labelled <b>For washing</b>	1	
Beaker or container (capacity approximately 400 cm <sup>3</sup> ), containing approximately 300 cm <sup>3</sup> tap water for pouring into test-tubes, labelled <b>Tap water</b>	1	
Beaker or container (capacity approximately 400 cm <sup>3</sup> ), labelled <b>For waste</b>	2	
Paper towels	8	
Beaker or container, to hold 50 cm <sup>3</sup>	5	
Beaker or container, to hold 50 cm <sup>3</sup> , labelled <b>R</b>	1	
Test-tubes, to hold more than 25 cm <sup>3</sup> but no more than 50 cm <sup>3</sup>	6	
Test-tube rack(s), to hold 6 test-tubes <b>or</b> to hold 5 test-tubes and a container to hold 1 test-tube	1	
Blunt forceps	1	
Scalpel blade or sharp blade	1	
Stop clock or timer showing seconds	1	
White card (approximately 10 cm × 10 cm)	1	
White tile or other suitable surface for cutting	1	
Glass marker pen	1	
Safety glasses/goggles	1	

During the examination, the Supervisor (**not** the Invigilator) should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and materials as the candidates, in order to obtain results for **Q1(a)(iii)**. The results should be written in the Supervisor's Report, on page 8, **not** on a spare question paper.

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

Please ensure that, if the scripts are in several packets, a copy of the Supervisor's Report and the candidates' seating plan are enclosed with each packet of scripts.

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

**Question 2**

- (i) Slide **J1** (supplied by Cambridge).

On receipt of the slides, please check that they are labelled **J1** and that none of the slides are broken. The material is **confidential** (so **must not** be disclosed to candidates) and the slides should **not** be viewed in advance of the examination.

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

- (ii) Microscope as described on page 2.

For each candidate:

- the microscope must be set up on low power
- the slide must **not** be on the stage of the microscope.

**MATERIALS TO BE SUPPLIED BY CAMBRIDGE**

- (i) Question papers.
- (ii) Slide **J1**.

**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. The slides must **not** be included in the packet of scripts.

Or

- purchased using the order form enclosed with the slides, which should be completed and returned to Cambridge. The order form must **not** be included in the packet 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.

**SUPERVISOR'S REPORT and SEATING PLAN**

The teacher responsible for the examination is asked to fill in the Supervisor's Report in these Confidential Instructions.

For Centres where more than one script packet is used, there must be a copy of the completed Supervisor's Report and the candidates' seating plan in each script packet. These Supervisors' Reports are essential in order to allow the Examiner to assess all candidates as fairly as possible and should always be completed by every Centre.

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

### SUPERVISOR'S REPORT

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*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 the Handbook for Centres.

3. During the examination, the Supervisor should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and materials as the candidates. The results for **Question 1(a)(iii)** 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**.
  
4. Enclose a **seating plan** of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for **each question**. Use **separate** paper for this.

**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 required by CIE to be despatched in more than one envelope, it is essential that a copy of the

- relevant Supervisor's Report
- appropriate seating plan(s) are sent inside **each envelope**.



Temperature of examination room ..... °C

Results for **Question 1(a)(iii)**

