
BIOLOGY

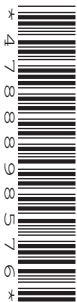
9700/35

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.



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 **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

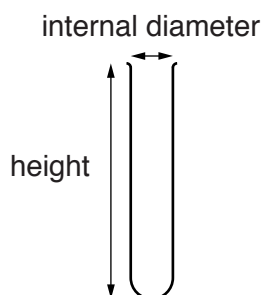
F = highly flammable substance

H = harmful or irritating substance

O = oxidising substance

T = toxic 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, 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 reagents should be available if requested by candidates.
- All solutions and reagents should be provided to candidates at **room temperature**.
- Clean, dry test-tubes and syringes are needed for each candidate.
- Fresh **pH 3, pH 4, pH 6, W, S1, S2** and **P** are needed for each candidate.
- All solutions and materials should be disposed of according to local safety regulations.

Summary of solutions and materials:

labelled	contents	hazard	concentration	volume / cm ³
pH 3	citric acid/sodium citrate buffer	[H] irritant	see instructions	at least 30
pH 4	citric acid/sodium citrate buffer	[H] irritant	see instructions	at least 30
pH 6	citric acid/sodium citrate buffer	[H] irritant	see instructions	at least 30
S1	citric acid/sodium citrate buffer at pH 5	[H] irritant	see instructions	at least 30
S2	hydrochloric acid	[H] irritant	1 M	at least 30
W	distilled water	none	–	at least 30

Materials:

labelled	contents	hazard	details	quantity
P	red cabbage	none	pieces of leaf	approximately 100 cm ² in total

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

Preparation of solutions and materials:

- [H] (i) **pH 3**, at least 30 cm³ of buffer pH 3 in a beaker or container, labelled **pH 3**.
- [H] (ii) **pH 4**, at least 30 cm³ of buffer pH 4 in a beaker or container, labelled **pH 4**.
- [H] (iii) **pH 6**, at least 30 cm³ of buffer pH 6 in a beaker or container, labelled **pH 6**.
- [H] (iv) **S1**, at least 30 cm³ of buffer pH 5 in a beaker or container, labelled **S1**.
- [H] (v) **S2**, at least 30 cm³ of 1 M hydrochloric acid in a beaker or container, labelled **S2**.
- (vi) **W**, at least 30 cm³ of distilled water in a beaker or container, labelled **W**.

The buffers, pH 3, pH 4, S1 (pH 5) and pH 6 should be prepared using the following stock solutions:

1 dm³ of 0.1 mol dm⁻³ citric acid. This is prepared by dissolving 19.2 g of citric acid in 500 cm³ of distilled water in a beaker and making up to 1 dm³ with distilled water.

1 dm³ of 0.1 mol dm⁻³ sodium citrate. This is prepared by dissolving 29.4 g of sodium citrate in 500 cm³ of distilled water in a beaker and making up to 1 dm³ with distilled water.

Then 100 cm³ of each buffer can be prepared as shown in the table below:

pH	0.1 mol dm⁻³ citric acid / cm³	0.1 mol dm⁻³ sodium citrate / cm³	distilled water / cm³
3	47.0	3.0	50
4	33.0	17.0	50
5	21.0	29.0	50
6	10.0	40.0	50

- (vii) **P**, pieces of red cabbage, with a total area of approximately 100 cm², in a container labelled **P**.

Apparatus for each candidate should be clean.

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

Apparatus for each candidate	Quantity	✓
2 cm ³ , 3 cm ³ or 5 cm ³ syringe, with the means to wash them out	2	
Beaker or container (capacity approximately 400 cm ³), containing tap water for pouring into test-tubes, labelled For washing	1	
Beaker or container (minimum capacity 400 cm ³), labelled For waste	1	
Beaker or container (capacity approximately 400 cm ³), containing approximately 200 cm ³ of distilled water, heated to about 40°C, labelled A	1	
Beaker or container (capacity approximately 250 cm ³)	1	
Paper towels	8	
Test-tubes, to hold a volume more than 15 cm ³ and less than 20 cm ³	6	
Test-tube rack or container, to hold 6 test-tubes	1	
Tripod, gauze, Bunsen burner and bench mat	1	
Blunt forceps	1	
Glass rod	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(b)(ii)**. These 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 L1 (supplied by Cambridge).

On receipt of the slides, please check that they are labelled L1 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 L1.

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

October/November 2015

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 reagents as the candidates. These results for **Question 1(b)(ii)** 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(b)(ii)**

