
BIOLOGY

5090/31

Paper 3 Practical Test

October/November 2016

CONFIDENTIAL INSTRUCTIONS

1 hour 15 minutes



Great care should be taken to ensure that any confidential information given does not reach the candidates either directly or indirectly.

If you have any problems or queries regarding these Instructions, please contact Cambridge
by email: 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 **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.

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.

If arrangements are made for different sessions for different groups of candidates, care must be taken to ensure that the different groups of candidates are effectively isolated so that **no information passes between them**.

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Pipette fillers and suitable eye protection 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

F = flammable

MH = moderate hazard

O = oxidising

HH = health hazard

N = hazardous to the aquatic environment

T = acutely toxic

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. There are **no** exceptions to this. Centres should also refer to the Cambridge Handbook.

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 **email** to info@cie.org.uk, by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

SUPERVISOR'S INSTRUCTIONS – CONFIDENTIAL

- Solutions and reagents provided to the candidates should be supplied in a suitable beaker or container. More of the solutions and reagents, including the agar, should be available if requested by candidates.
- Fresh agar is needed for each candidate.
- Fresh test-tubes are needed for each candidate.
- All solutions and reagents should be disposed of according to local safety regulations.

Each candidate should be provided with:

| Q | labelled | contents | hazard | volume/cm ³ |
|---|---------------------|--|----------------------|------------------------|
| 1 | A | 1.0M ethanoic acid | none | 50 |
| 1 | B | 1.0M ethanoic acid | none | 50 |
| 1 | C | 1.0M ethanoic acid | none | 50 |
| 1 | agar | agar block, 20 mm × 10 mm × 10 mm, provided in Petri dish with lid | none | |
| 2 | iodine solution | iodine solution, as required for food tests | low hazard | |
| 2 | Benedict's solution | Benedict's solution, as required for food tests | low hazard | |
| 2 | biuret solution | biuret solution, as required for food tests | [C] corrosive | |

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

Preparation of solutions and reagents:

- To prepare the agar blocks, 25g of powdered agar should be added to 500cm³ of boiling water to dissolve the agar. 4 cm³ of cresol red indicator solution (5 g solid in 100cm³ distilled water) should be added to 500cm³ of the agar along with enough 2.0M sodium hydroxide to produce a distinctive red colour (2 cm³ should be sufficient).
The agar should then be poured into shallow trays at least 1 cm deep and kept in cool conditions in order to set firmly. Normal agar sets between 20 °C and 40 °C.
A 10 mm × 10 mm × 10 mm block of the agar should completely change colour in 20 minutes when immersed in the acid. Concentration or type of acid should be altered if this is not the case, and a note made in the Supervisor's Report.

Apparatus for each candidate should be clean.

| Apparatus for each candidate | Quantity | ✓ |
|---|----------|---|
| Question 1 | | |
| beaker containing 50 cm ³ 1.0 M dilute ethanoic acid, labelled A | 1 | |
| beaker containing 50 cm ³ 1.0 M dilute ethanoic acid, labelled B | 1 | |
| beaker containing 50 cm ³ 1.0 M dilute ethanoic acid, labelled C | 1 | |
| agar block, measuring 20 mm × 10 mm × 10 mm, provided in Petri dish with lid | 1 | |
| white tile | 1 | |
| sharp knife or scalpel | 1 | |
| paper towels | 4 | |
| ruler (mm) | 1 | |
| stop-clock or view of a clock | | |
| Question 2 | | |
| test-tubes | 2 | |
| test-tube rack or container to hold 2 test-tubes | 1 | |
| soaked broad bean seeds. These should have been soaked for a minimum of 24 hours and presented in a shallow dish labelled bean . | 2 | |
| soaked maize seeds. These should have been soaked for a minimum of 24 hours and presented in a shallow dish labelled maize . | 2 | |
| white tile | 1 | |
| sharp knife or scalpel | 1 | |
| hand lens (×6 minimum) | 1 | |
| iodine solution in dropping bottle, labelled iodine solution | 1 | |
| Benedict's solution in dropping bottle, labelled Benedict's solution | 1 | |
| biuret solution in dropping bottle, labelled biuret solution | 1 | |
| 500 cm ³ glass or metal beaker or container, labelled water bath , to act as a water bath | 1 | |
| access to hot water (70 °C) for Benedict's test | | |
| paper towels | 4 | |
| stop-clock or view of a clock | | |
| suitable eye protection | 1 | |

During the examination, the Supervisor (**not** the Invigilator) should, **out of sight of the candidates**, carry out **Question 1** and **Question 2** using the same solutions as the candidates. These results should be written in the Supervisor's Report, not on a spare question paper.

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

SUPERVISOR'S REPORT

Cambridge Ordinary Level

October/November 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.

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- 2** Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

- (a) difficulties with specimens or materials
- (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.

Other cases of individual hardship, e.g. illness or disability, should be reported direct to Cambridge on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

- 3** During the examination, the Supervisor should, **out of sight of the candidates**, carry out the practical parts of **Question 1** and **Question 2**, using the same apparatus and solutions 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.
- 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 session.

Temperature of examination room °C.

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

Results for **Question 2(b)(ii)**:

Declaration (to be signed by the Supervisor)

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

Centre name

If scripts are required by Cambridge to be dispatched in more than one packet, it is essential that a copy of the Supervisor's Report and the appropriate seating plan(s) are sent inside **each packet**.