



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY

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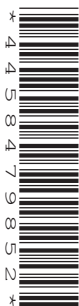
Paper 5 Practical Test

October/November 2015

CONFIDENTIAL INSTRUCTIONS

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 Confidential 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 **6** printed pages and **2** blank pages.

READ THESE INSTRUCTIONS FIRST

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. **Testing must be done out of sight of all candidates.**

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 that the Supervisor's Report is fully completed and a copy is enclosed with each packet of scripts.

It is assumed that the ordinary apparatus of a science laboratory will be available, including a supply of purified water (distilled or deionised).

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.**

All specimens should carry only the code letters and numbers as indicated and their identity should not be revealed to the candidates.

Supervisors should ensure that all specimens have the correct identity attached to the specimen and that these are **not** removed during 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.

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

N = harmful to the environment

T = toxic substance

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination.

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.

Question 1

Each candidate should be provided with:

- (i) three large test-tubes (approximately 25 mm × 150 mm)
- (ii) three standard test-tubes (approximately 15 mm × 150 mm)
- (iii) means of measuring 10 cm³, e.g. 10 cm³ syringe
- (iv) two × means of measuring 1 cm³, e.g. two 1 cm³ syringes
- (v) one large empty beaker (capable of supporting three large and three standard test-tubes)
- (vi) three beakers, each deep enough to support a large test-tube and a standard test-tube:
 - a. one containing an ice and water mixture, labelled **cold**
 - b. one containing water at room temperature, labelled **warm**
 - c. one empty beaker labelled **hot**.
 Candidates have been asked to raise their hand when they need hot water.
- (vii) supply of hot water at 55 °C
- (viii) one thermometer, range –10 °C to 100 °C
- (ix) 10 cm³ yeast suspension in a closed container, labelled **yeast suspension**
- (x) 10 cm³ of 0.005% methylene blue solution, labelled **methylene blue solution**
- (xi) 40 cm³ of 10% glucose solution, labelled **glucose solution**
- (xii) glass rod
- (xiii) access to paper towels (in case of spillages)
- (xiv) view of a clock or timer that allows the candidates to time seconds accurately.

Yeast stock suspension preparation (sufficient for 10 candidates):

- Weigh 20 g of dry active **baking** yeast. **This should be new stock.**
- Add 100 cm³ warm water*. This should be at approximately 35 °C.
- Stir thoroughly.

*If tap water is used, it should be boiled before use.

Sufficient solution for the candidates should be made about 15–30 minutes before the start of the examination and left to start to respire. This can be kept at room temperature once mixed.

Please note that there is great variation between yeast sold for baking purposes. Brewer's yeast is NOT suitable. It is essential that the yeast is active and respiring, so trialling must be carried out in sufficient time to allow sourcing of a suitable yeast (see page 4 for details of trialling).

Solution preparation:**0.1 % methylene blue stock solution**

- Weigh 0.1 g methylene blue-trihydrate (M_r 373.9).
- Add 50 cm³ of distilled water and stir until dissolved.
- Make up to 100 cm³ with distilled water.

This should be prepared a week before the examination and stored in a cool place.

0.005 % methylene blue (sufficient for 20 candidates)

- Take 10 cm³ of 0.1% methylene blue stock solution and make up to 200 cm³ with distilled water.
- Stir to mix.

This should be made the day before the examination and stored in a cool place.

Before the examination, the Supervisor must try out this part of the investigation.

The Supervisor should carry out part of the investigation by adding 10 cm³ of 10% glucose solution and 1 cm³ of 0.005% methylene blue solution to a large test-tube. 1 cm³ of the yeast suspension should be added to a standard test-tube. Both tubes should be kept at room temperature (20°C–25°C) for 5 minutes. The yeast suspension should then be tipped into the large test-tube containing the mixture of glucose and methylene blue solutions and shaken until the blue colour is evenly spread. The time for the methylene blue colour to fade completely should be between 10–12 minutes at room temperature. If a longer time is recorded with yeast that is actively respiring, then the yeast concentration can be increased by up to a further 5%.

It may be necessary to try more than one type of dried yeast as the activity can vary greatly.

The Supervisor (**not** the Invigilator) should carry out the practical aspects of **Question 1** and record their results in the space in the Supervisor's Report. This must be done during the examination, using the same apparatus and reagents as the candidates but **out of sight** of the candidates.

Question 2

Each candidate should be provided with:

- (i) one ruler (with mm scale)

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This form should be completed and returned to CIE with the scripts.

REPORT ON PRACTICAL BIOLOGY

The Supervisor 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;

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(b) accidents to apparatus or materials;

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(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 CIE 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 aspects of **Question 1**, using the same apparatus and reagents as the candidates. Results should be recorded in the space on page 8 (**not** on a spare Question Paper). Attach extra sheets if necessary.

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

- 4 A plan of work benches, giving details of the candidate numbers of the places occupied by the candidates for each session, must be enclosed with the scripts.

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

The preparation of this practical 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 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 inside **each packet**.