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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

BIOLOGY **9700/03**

Paper 3 Practical Test AS

October/November 2005

1 hour 15 minutes

CONFIDENTIAL INSTRUCTIONS

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

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:

- Low-power objective lens, e.g. ×10 (equal to 16 mm or $\frac{2}{3}''$)
- High-power objective lens, e.g. × 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

Each candidate must have sole, uninterrupted, use of the microscope for at least 35 minutes.

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

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

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UNIVERSITY of CAMBRIDGE
International Examinations

[Turn over

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres are also referred to the Handbook for Centres 2005, and in particular Section 3.1.2 (c) (i), Security of Question Papers and Examination Materials, as well as 3.3.11.1, Practical Examinations in Science Subjects.

If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to sort out, it is essential for Centres to contact the Product Manager, Dr Rick Nelms, as soon as possible by e-mail to international@ucles.org.uk, by fax to +44 1223 553558 or by phone to +44 1223 553554.

Instructions to Supervisors

Each candidate must be provided with the following apparatus and materials.

To be supplied by the Centre

Question 1

Each candidate will require:

(i) 10 cm^3 of starch suspension, labelled as such. This is prepared by creaming 1 g of starch, supplied by CIE, with about 5 cm^3 of cold water. Add this to 80 cm^3 of boiling, distilled water. Stir well to obtain a uniform suspension. Make this up to 100 cm^3 with distilled water. Stir well. **Centres are advised to try this out well beforehand**.

[H] **(ii)** A test-tube containing 5 cm^3 of amylase solution supplied by CIE. The solution should be prepared just prior to the examination by dissolving 0.5 g of amylase powder in 100 cm^3 distilled water and labelled **A2**.

A second test-tube containing 5 cm^3 of amylase solution. The solution should be prepared just prior to the examination by dissolving 0.25 g of the amylase powder in 100 cm^3 distilled water and labelled **A3**.

A third test-tube containing 5 cm^3 of amylase solution. The solution should be prepared just prior to the examination by dissolving 0.1 g of the amylase powder in 100 cm^3 distilled water and labelled **A1**.

The enzyme powder should be **kept cool**, but not frozen, and **tested well in advance of the examination**, in order to replace if necessary.

To test the enzyme, mix 1 cm^3 of starch solution, made up as above, with 1 cm^3 of amylase solution **A2**. Drops of this mixture taken immediately should go black when mixed with iodine in potassium iodide solution (often called iodine solution). Within five minutes an end point should be reached where mixing a sample with iodine solution no longer gives a blue/black colour.

If the end point is not reached within five minutes, then the concentration of **A2** should be increased to 1 g of amylase in 100 cm^3 of distilled water. (If this works, then **A3** will need to be 0.5 g of amylase per 100 cm^3 water and **A1** will need to be 0.2 g of amylase per 100 cm^3 water). If the end point is still not reached within five minutes fresh amylase must be obtained from CIE. In case of further difficulty, the starch solution could be diluted.

Centres are advised to try this out well before the examination. Any changes in concentrations that are made should be fully recorded on the Report Form on pages 7 and 8 of these Confidential Instructions.

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(iii) Iodine in potassium iodide solution with dropper and labelled as '**iodine solution**'. To make up this solution, dissolve 2 g of potassium iodide in 30 cm^3 of distilled water. Dissolve 1 g of finely divided iodine **[H]** in this solution, which may require repeated shaking for up to 24 hours. Make up the solution to 300 cm^3 with distilled water.

(iv) Dropper pipette.

(v) Access to water.

(vi) Pipette or syringe graduated to 10 cm^3, $\times 3$.

(vii) Three test-tubes with rack.

(viii) Stirring rod.

(ix) White tile (at least 15 cm x 15 cm) with paper towel to dry the tile and a wax pencil, waterproof marker or labels to label the tile.

(x) Stopclock or stopwatch or sight of clock with second hand.

Question 2

Each candidate will require:

(i) Slide **S1** (from CIE).

(ii) A microscope with:
- Low-power objective lens, e.g. $\times 10$ (equal to 16 mm or $\frac{2}{3}''$)
- High-power objective lens, e.g. $\times 40$ (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

MATERIALS TO BE SUPPLIED BY CIE

(i) Question papers.

(ii) Starch (question 1).

(iii) Amylase (question 1).

(iv) Slide **S1** (question 2, shared between two candidates).

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

Immediately after the examination, microscope slides **must** be returned to CIE in the containers in which they were received, using the self-adhesive label for the parcel. They must **not** be included in the parcel of scripts. It may be possible to buy the slides, in which case an order form will be enclosed with the slides, and should be returned to CIE using the self-adhesive label for the letter. Slides and containers not returned in good condition will be charged at a rate of £3 per item to which may be added administrative costs.

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REPORT FORM

The teacher responsible for the examination is asked to fill in the Report Form on pages 7 and 8 of these Confidential Instructions. For Centres where more than one script envelope is used, there must be a copy of the complete Report Form in every script packet.

These report forms are vital in order to allow the examiners to assess all candidates a fairly as possible, and should always be competed by every Centre.

A copy of the seating plan for the examination room must also be enclosed in each script envelope.

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

REPORT ON PRACTICAL BIOLOGY

A Level

October/November Session 2005

**The Supervisor or Teacher responsible for the subject should provide the following information.*

1 Was any difficulty experienced in providing the necessary materials, in particular the starch and the amylase required? 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 Part 6 of the Handbook for Centres.

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3 Enclose a plan of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for each session. The space below can be used for this, or it may be on separate paper.

Declaration (to be signed by the Principal)

The preparation of the 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 CIE to be despatched in more than one envelope, it is essential that a copy of the relevant Supervisor's Report and the appropriate seating plan(s) are sent inside **each envelope**.

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