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

BIOLOGY **9700/32**

Paper 32 Advanced Practical Skills **May/June 2010**

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: International@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.

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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 55 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

N = harmful to environment

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, 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 as soon as possible by e-mail to international@cie.org.uk, by fax to +44 1223 553558 or by phone to +44 1223 553554.

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Confidential Instructions

Each candidate will require

Question 1

Fresh B, A, Y, S, C and G are needed for each candidate.
More of the solutions should be available if requested by candidates.
Solutions and reagents provided to the candidates should be supplied in a suitable beaker, or container, for removal of the solution using a syringe.

[H] (i) **B**, at least 50 cm^3 of 0.02% bromothymol blue solution, in a covered beaker or container, labelled **B**.

This is prepared by making a 2.0% stock solution by dissolving 1 g of bromothymol blue (supplied by Cambridge) in 50 cm^3 of distilled water. Mix well.

To make the 0.02% bromothymol blue solution, add 1 cm^3 of this 2.0% stock solution to a beaker, make up to 100 cm^3 with distilled water and mix well.

[H] (ii) **A**, at least 20 cm^3 of 0.01 mol dm^{-3} sodium hydroxide solution in a beaker or container, labelled **A**.

This is prepared by putting 0.2 g of solid sodium hydroxide (approximately one pellet) in 500 cm^3 of distilled water and mixing well.

(iii) **Y**, at least 15 cm^3 of 7% yeast suspension, in a beaker or container, labelled **Y**. This volume should not include any froth.

Y should be prepared one hour before the examination. In a large container add 7.0 g of dried yeast (for baking) to 40 cm^3 of warm distilled water. Stir and make up to 100 cm^3 with distilled water. This should be kept for 30 to 40 minutes at a temperature of 35 °C to 40 °C.

10 to 15 minutes before the candidate starts **Question 1**, sprinkle 20 g of glucose over the surface of the suspension and stir thoroughly.

(iv) **S**, at least 15 cm^3 of 2% sodium alginate solution in a small beaker or container, labelled **S**.

This is prepared by dissolving 2 g of sodium alginate in 50 cm^3 of warm distilled water, stirring well and making up to 100 cm^3 with warm distilled water. Continue stirring until dissolved. Cool to room temperature.

This should be prepared the day before the examination and kept refrigerated.

[H] (v) **C**, at least 50 cm^3 of 1.5% calcium chloride solution in a beaker or container, labelled **C**.

This is prepared by dissolving 1.5 g of calcium chloride in 50 cm^3 of distilled water and making up to 100 cm^3 with distilled water.

(vi) **G**, at least 40 cm^3 of 2% glucose solution, in a beaker or container, labelled **G**.

This is prepared by dissolving 2.0 g of glucose in 50 cm^3 of distilled water and making up to 100 cm^3 with distilled water.

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

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Apparatus:

(i) Four 10 cm^3 syringes or one with the means to wash it out.

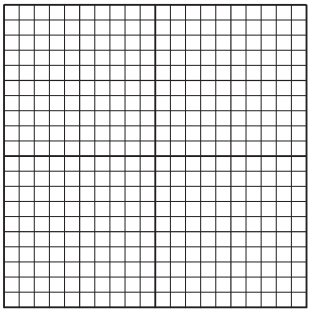
(ii) Two 5 cm^3 syringes or one with the means to wash it out.

(iii) Container with tap water, labelled **For washing**.

(iv) Container, labelled **Waste**.

(v) One small beaker or container of maximum volume 25 cm^3.

(vi) Grid on white card 4 cm × 4 cm with 2 mm grid lines.



(vii) One large test-tube.

(viii) 5 small test-tubes.

(ix) Bung(s) to fit small test-tubes.

(x) Test-tube rack or container to hold at least 6 test-tubes.

(xi) Glass rod.

(xii) Teat pipette.

(xiii) Petri dish or shallow container.

(xiv) Blunt forceps.

(xv) Stop clock, stop watch or sight of a clock with a second hand.

(xvi) Glass marker pen.

(xvii) Safety goggles/glasses.

The Supervisor should, **out of the sight of the candidates**, carry out **Question 1** and write the **results** in the Supervisor's report which should be enclosed with the candidates' scripts. Please ensure that if the scripts are in several packets that a copy of the Supervisor's report is enclosed with each packet of scripts. The invigilator should **not** carry out **Question 1**.

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Question 2

(i) Slide **M1** (supplied by Cambridge)

(ii) 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 (supplied by Cambridge) fitted within the eyepiece and visible in focus at the same time as the specimen.

On receipt of the slides, please check that they are labelled **M1** and that all the slides are intact. The identity of material on the slides is **confidential** and must **not** be disclosed to candidates.

Each candidate must have sole, uninterrupted use of the microscope for 55 minutes.

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

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MATERIALS TO BE SUPPLIED BY CAMBRIDGE

(i) Question papers

(ii) Bromothymol blue

(iii) Slide **M1**

(iv) Eyepiece graticule

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. They must **not** be included in the package of scripts.

Or

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

REPORT FORM

The teacher responsible for the examination is asked to fill in the Report Form in these Confidential Instructions. For Centres where more than one script package is used, there must be a copy of the completed Report Form in each script package.

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

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

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

REPORT ON PRACTICAL BIOLOGY

A Level

May/June Session 2010

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 Part 6 of the Handbook for Centres.

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3. The Supervisor should, **out of sight of the candidates**, carry out **Question 1** and write the **results** in the Supervisor's report which should be enclosed with the candidates' scripts. Please ensure that if the scripts are in several packets 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 plan of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for each session on a separate piece of paper.

Declaration (to be signed by the Principal)

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 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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