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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

COMBINED SCIENCE **0653/51**

Paper 5 Practical Test **October/November 2013**

CONFIDENTIAL INSTRUCTIONS

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

1360638501

The Supervisor's attention is drawn to the form on page 8 which must be completed and returned with the scripts.

If you have any 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 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 detail the apparatus, reagents and specimens 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 teacher to test the apparatus appropriately. **No access is permitted to the question paper in advance of the examination session.**

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. Only those tests described in the Question Paper should be attempted. Pipette fillers and safety goggles should be used where necessary.

In accordance with 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 the environment

The attention of Centres is drawn to any local regulations relating to safety, first-aid and disposal of chemicals.

'Hazard Data Sheets', relating to materials used in this examination, should be available from your chemical supplier.

The Supervisor should make sure the Supervisor's Report is fully completed and a copy is enclosed with each packet of scripts.

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, the Security of Question Papers and Examination Materials section and the Practical Examinations in Science Subjects section.

If there are 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 phone to +44 1223 553554 or by fax to +44 1223 553558.

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For Question 1

Each candidate will require:

(i) access to apparatus set up one hour before the examination, as in Fig. 1.1 (see **note** over page)

(ii) about 100 cm^3 2% starch solution, labelled **starch solution**

(iii) about 20 cm^3 5% amylase solution, labelled **amylase solution**

(iv) 6 large test-tubes (approximately 150 x 25 mm), and a means to support them

Centres may provide fewer test-tubes (minimum four). Candidates will then have to rinse out test-tubes with distilled water, which must be provided.

(v) a means of labelling the test-tubes

(vi) teat pipette

(vii) glass rod

(viii) access to iodine solution in a dropping bottle, or other container with a dropping pipette available, labelled **iodine solution**

[H] **(ix)** access to Benedict's solution in a dropping bottle, or other container with a dropping pipette available, labelled **Benedict's solution**

(x) access to a very hot (simmering) water bath. The candidates should have a means to support their test tubes in the water

(xi) access to a wall clock or timer.

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Note: The apparatus is set up as follows:

- Cut a piece of visking tubing about 20 cm in length.
- Cut two holes near each end of the visking tubing, big enough for a glass rod to fit through them.
- Soften the visking tubing by running it under tapwater until the tubing can be opened.
- Hold the visking tubing in a U-shape, and use a dropping pipette to place a mixture of equal volumes of 2% starch solution and 5% amylase solution into it. Use enough mixture to half-fill the visking tubing.
- Rinse the outside of the visking tubing, to make sure that none of this mixture is on the outside of the tube.
- Insert a glass rod through the holes in the piece of visking tubing, and hang the visking tubing in a beaker of warm (30 - 40 °C) water, as shown in Fig. 1.1.
- One set of this apparatus can be shared between up to four candidates, if necessary.

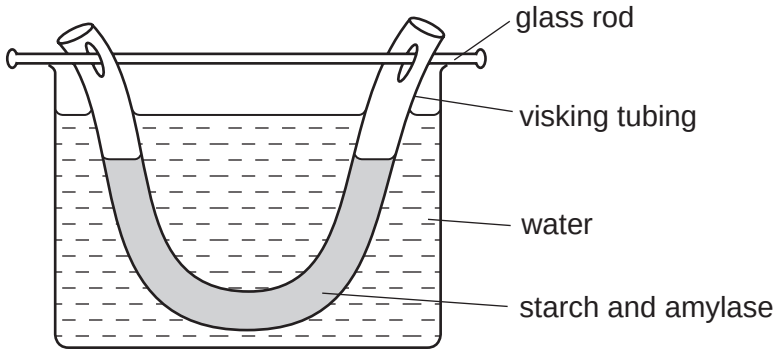

Fig. 1.1

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For Question 2

Each candidate will require:

(i) a convex lens with focal length $f = 15$ cm, with holder

(ii) a metre rule graduated in 0.1 cm divisions

(iii) an illuminated object with a hole in the shape of an equilateral triangle of side approximately 2 cm. The object can be made by cutting a triangular hole in a piece of white card, and covering the hole with translucent paper. The illumination can be provided by a 12 V, 24 W lamp, or similar

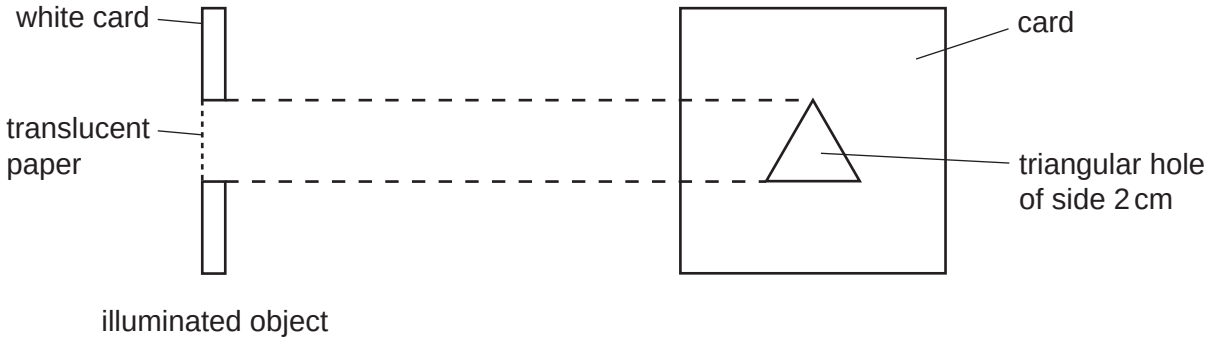

Fig. 2.1

(iv) a white screen. The screen can be made from a sheet of white card (10 cm × 10 cm approx.). Some means of supporting the screen vertically must be supplied (e.g. fixing the white card to a small block of wood).

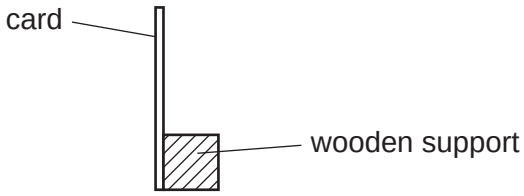

Fig. 2.2

Note: The lamp filament, the centre of the hole in the object card and the centre of the lens should be arranged to be the same height above the bench. The apparatus should be set up before each session as shown in Fig. 2.3. An unfocused image should be visible on the screen when the lamp is switched on.

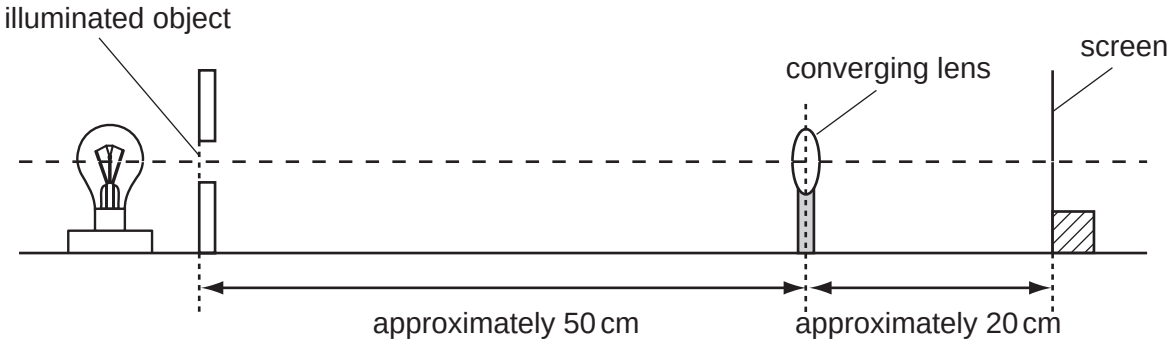

Fig. 2.3

For Question 3

Each candidate will require:

(i) about 1 g of copper carbonate in a hard glass test-tube approximately 125 x 15 mm, labelled **X**

(ii) another 1 g of copper carbonate in a suitable container, labelled **X**

(iii) 3 test-tubes, approximately 125 x 15 mm

(iv) delivery tube, inserted into a stopper to fit a 125 x 15 mm test-tube

(v) Bunsen burner

(vi) test-tube holder

(vii) small beaker

(viii) filter funnel

(ix) filter paper

[H] **(x)** about 5 cm^3 of dilute hydrochloric acid, approximately 2.0 mol dm^{-3}, labelled **dilute hydrochloric acid**

[H] **(xi)** about 10 cm^3 of limewater, labelled **limewater**

[H] **(xii)** about 30 cm^3 of dilute sodium hydroxide, approximately 0.4 mol dm^{-3}, labelled **dilute sodium hydroxide**

[C] **(xiii)** about 10 cm^3 of dilute nitric acid, approximately 1.0 mol dm^{-3}, labelled **dilute nitric acid**

(xiv) about 20 cm^3 of ammonia solution, approximately 2.0 mol dm^{-3}, labelled **ammonia solution**

(xv) dropping pipettes

(xvi) small measuring cylinder (5 cm^3, 10 cm^3 or 20 cm^3)

(xvii) glass rod

(xviii) spatula

(xix) test-tube rack

(xx) access to a wall clock or timer.

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Spare materials and equipment should be available and can be provided without penalty. **Candidates should be made aware of this.**

Information required from the Supervisor:

The Supervisor is asked to carry out the experiments and to enter the results on a spare copy of the examination paper, clearly marked 'Supervisor's Results' and showing the Centre number. This should be done, out of sight of the candidates, using the same solutions, reagents, specimens and apparatus as the candidates.

A copy of the 'Supervisor's Results' should be returned with each packet of scripts. Failure to do so may cause the candidates to be penalised.

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This form must be completed and returned in the envelope with the scripts together with the seating plan and the Supervisor's Results as mentioned on page 7.

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General

The Supervisor is invited to give details of any difficulties experienced by particular candidates giving their names and candidate numbers. These should include reference to:

(a) difficulties due to faulty apparatus;

(b) accidents to apparatus or materials;

(c) physical handicaps, e.g. short sight, colour blindness;

(d) any other information that is likely to assist the Examiner, especially if this cannot be discovered in the scripts;

(e) any help given to a candidate.

The Supervisor is asked to supply the following information:

Plan of work benches, giving details by candidate numbers of the places occupied by the candidates for each session and a copy of the 'Supervisor's Results'.

NAME OF CENTRE .....

SIGNED .....
Supervisor

CENTRE NUMBER .....

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.

NAME .....
(in block capitals)

SIGNED ..... (Principal)

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