



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**CO-ORDINATED SCIENCES**

**0654/52**

Paper 5 Practical Test

**May/June 2013**

CONFIDENTIAL INSTRUCTIONS

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

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**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.

\* 1 6 5 4 4 2 8 5 4 2 \*

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This document consists of **8** printed pages.



## 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, 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](mailto:info@cie.org.uk), by phone to +44 1223 553554 or by fax to +44 1223 553558.

**Please turn over for Question 1.**

**For Question 1**

Each candidate will require:

- (i) two similar dicotyledonous potted plants labelled **plant A** and **plant B**, e.g. geranium, set up as shown in Fig. 1.1, on page 5.

**[H]** Plant **A** should have a chemical placed in the bag to absorb any carbon dioxide. Soda lime could be used.

Plant **B** requires no chemicals (to absorb carbon dioxide).

The plants should be well watered, destarched by being left in the dark for 48 hours. Their leaves should be partly covered (top and bottom) with black paper, as shown in Fig. 1.1. They should be left under bright lights for 2 days before the examination. Candidates will use one leaf from each plant, so the same plants can be shared between several candidates.

(ii) Bunsen burner and a means to light it

(iii) heatproof mat

(iv) tripod

(v) gauze

(vi) 500 cm<sup>3</sup> beaker and water to half fill it or access to a very hot (simmering) water bath

(vii) tweezers

**[F][H]** (viii) 30 cm<sup>3</sup> alcohol (ethanol), labelled **alcohol**

(ix) two large hard glass test-tubes (150 x 25 mm)

(x) container (or large beaker) for the safe disposal of the alcohol, labelled **waste alcohol**

(xi) iodine solution in a dropping bottle, labelled **iodine**

(xii) 2 white tiles

(xiii) permanent marker pen.

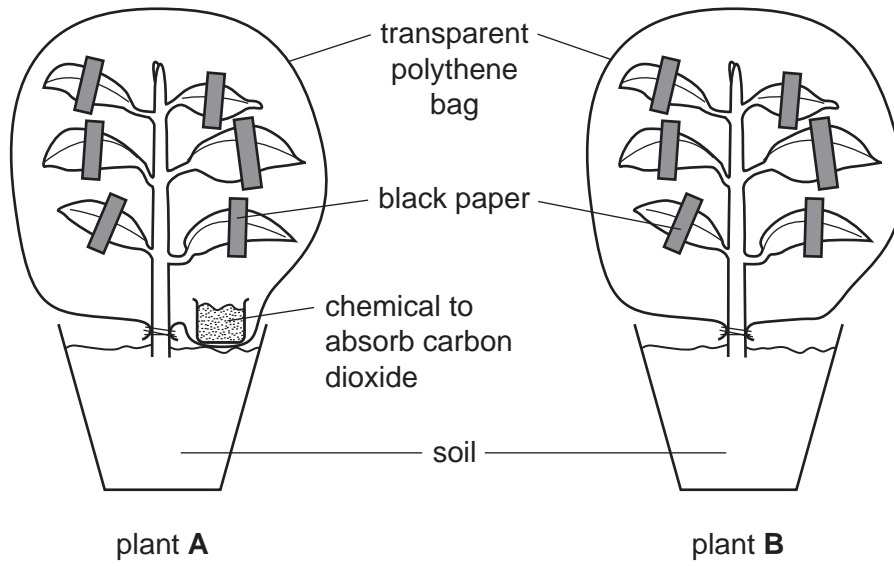


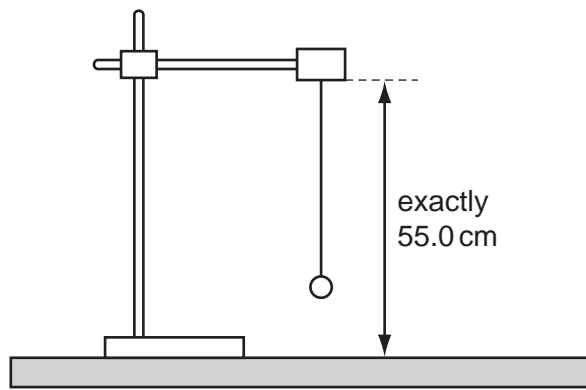
Fig. 1.1

**For Question 2**

Each candidate will require:

- (i) a clamp, boss and stand
- (ii) a pendulum bob attached to approximately 70 cm of thread
- (iii) a split cork or similar to hold the thread in the clamp
- (iv) a metre rule with a millimetre scale
- (v) a stopwatch.

**Note:** The simple pendulum is to be set up for the candidates with the point of support **exactly** 55.0 cm above the level of the bench, as shown in Fig. 2.1.



**Fig. 2.1**

**For Question 3**

Each candidate will require:

- [H] (i) about 10 cm<sup>3</sup> of approximately 0.4 mol dm<sup>-3</sup> sodium hydroxide, labelled **A**
- (ii) about 10 cm<sup>3</sup> of approximately 1.0 mol dm<sup>-3</sup> ammonia solution, labelled **B**
- [H] (iii) about 10 cm<sup>3</sup> of approximately 1.0 mol dm<sup>-3</sup> hydrochloric acid, labelled **C**
- [H] (iv) about 10 cm<sup>3</sup> of approximately 1.0 mol dm<sup>-3</sup> sulfuric acid, labelled **D**
- (v) 4 test-tubes, (125 x 15 mm) with means of supporting them
- (vi) Universal Indicator solution with dropper, labelled **Universal Indicator**
- [N] [H](vii) about 10 cm<sup>3</sup> aqueous silver nitrate, approximately 0.05 mol dm<sup>-3</sup>, labelled **silver nitrate**
- (viii) about 10 cm<sup>3</sup> aqueous barium chloride, approximately 0.1 mol dm<sup>-3</sup>, labelled **barium chloride**
- (ix) about 10 cm<sup>3</sup> aqueous copper(II) sulfate, approximately 0.5 mol dm<sup>-3</sup>, labelled **copper sulfate**
- (x) distilled water in a washbottle, labelled **distilled water**
- (xi) 500 cm<sup>3</sup> beaker or container, labelled **waste**
- (xii) permanent marker pen
- (xiii) 7 teat pipettes.

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.**

**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.**

**May/June 2013**

*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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