



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CO-ORDINATED SCIENCES

0654/51

Paper 5 Practical Test

May/June 2014

CONFIDENTIAL INSTRUCTIONS

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

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

Question 1

Each candidate will require:

- (i) 6 dropping pipettes
- (ii) a white spotting tile with deep wells, (five heavy glass watch glasses with flat bases placed on white paper may be used as an alternative)
- (iii) 10 cm³ 0.1% DCPIP (2,6-dichlorophenolindophenol) solution, labelled **DCPIP**. This will decolourise readily by oxidation with air and should be freshly prepared and kept in a stoppered bottle, preferably made of dark glass
- (iv) 10 cm³ of each of the following concentrations of vitamin C:

concentration of vitamin C (%)
0.25 (labelled 0.25% vitamin C)
0.50 (labelled 0.50% vitamin C)
0.75 (labelled 0.75% vitamin C)
1.00 (labelled 1.00% vitamin C)

- (v) 10 cm³ lemon juice or other locally available lightly coloured fruit juice, labelled **fruit juice**. The juice should be tested to ensure it will decolourise two drops of DCPIP solution using less than a full well of juice.

The apparatus should be tested to ensure that the spotting tiles/watch glass wells are deep enough. They should be big enough to contain two drops of DCPIP plus enough drops of 0.50% vitamin C to decolourise this amount of DCPIP.

Question 2

Each candidate will require:

- (i) hard glass test-tube (125 mm x 15 mm), one quarter full of solid sodium hydrogencarbonate, NaHCO_3 and stoppered. This test-tube should be supported, for example in a beaker, and the support (not the test-tube) labelled **sodium hydrogencarbonate**
- (ii) another sample of approximately 2 g solid sodium hydrogencarbonate, NaHCO_3 , labelled **sodium hydrogencarbonate**
- (iii) approximately 1 g solid anhydrous sodium carbonate, Na_2CO_3 , labelled **sodium carbonate**
- (iv) 6 test-tubes (125 mm x 15 mm)
- (v) 2 stoppers to fit test-tubes in (iv)
- (vi) delivery tube to fit hard glass test-tube in (i)
- [H] (vii) a supply of limewater (approximately 10 cm^3 is required), labelled **limewater**
- (viii) a supply of distilled water (approximately 30 cm^3 is required), labelled **distilled water**
- (ix) Universal Indicator solution (full range indicator), labelled **Universal Indicator**, with a dropping pipette and access to the pH chart
- (x) about 20 cm^3 of approximately 1.0 mol dm^{-3} hydrochloric acid, labelled **hydrochloric acid**
- [H] (xi) about 20 cm^3 of approximately 0.1 mol dm^{-3} sodium hydroxide solution, labelled **sodium hydroxide**
- [H] (xii) about 20 cm^3 of approximately 1.0 mol dm^{-3} copper sulfate solution, labelled **copper sulfate**
- (xiii) sight of a clock on which candidates can easily read minutes
- (xiv) spatula
- (xv) Bunsen burner, and a means to light it
- (xvi) means of holding a test-tube
- (xvii) a 10 cm^3 or 20 cm^3 measuring cylinder.

Question 3

Each candidate will require:

- (i) a piece of plasticine (modelling clay) of mass approximately 100g. The plasticine should be softened and moulded into a rough spherical shape
- (ii) a 30 cm or a 50 cm rule with a millimetre scale
- (iii) a 250 cm³ measuring cylinder
- (iv) a piece of thread long enough for candidates to be able to lower a piece of the plasticine into the measuring cylinder
- (v) a 250 cm³ beaker containing approximately 100 cm³ of cold water, labelled **water**
- (vi) access to a balance capable of measuring mass to 0.1 g
- (vii) a knife edge – a prism or wooden block placed on the bench
- (viii) a metre rule with a millimetre scale
- (ix) a 50 g mass fixed to the metre rule with its centre above the 10.0 cm mark on the rule
- (x) a supply of paper towels.

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 5.

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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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