
COMBINED SCIENCE

0653/52

Paper 5 Practical Test

October/November 2016

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 **7** printed pages and **1** blank page.

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

MH = moderate hazard

HH = health hazard

T = acutely toxic

F = flammable

O = oxidising

N = hazardous to the aquatic 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) 5 cm³ of '**10 vol**' fresh hydrogen peroxide labelled **hydrogen peroxide** (see note 1)
- (ii) 2 cm³ syringe barrel and plunger without needle
- (iii) fresh celery stick at least 3 cm in length and no wider than 1.5 cm
- (iv) white tile
- (v) scalpel
- (vi) stirring rod
- (vii) test-tube (125 mm × 15 mm) (see note 2)
- (viii) access to detergent with a dropping pipette labelled **detergent**
- (ix) 30 cm ruler, capable of measuring to 1 mm
- (x) stopwatch
- (xi) paper towels.

Notes

1. Hydrogen peroxide should be made up fresh for the exam.
2. Prior to the exam, the supervisor should make up a batch of hydrogen peroxide, finely chop up 1.5 cm piece of celery stalk and add to 2 cm³ of hydrogen peroxide in a test-tube. If the foam reaches the top of the test-tube within 10 minutes then large test-tubes (150 mm × 25 mm) should be used. Otherwise standard test-tubes must be used.

Question 2

Each candidate will require:

- [F] (i) four separate 0.5g samples of recently purchased magnesium powder labelled **magnesium**
- [MH][N] (ii) approximately 100 cm³ 200 g dm⁻³ copper sulfate, CuSO₄·5H₂O labelled **copper sulfate**
- (iii) -10 to +110 °C thermometer at 1 °C graduations
- (iv) stirring rod
- (v) plastic cup
- (vi) small, e.g. 100 cm³, beaker
- (vii) 25 cm³ measuring cylinder
- (viii) 10 cm³ measuring cylinder
- (ix) large beaker, minimum 250 cm³, labelled **waste**
- (x) supply of water (if it is more convenient to supply this in a bottle then 250 cm³ would be appropriate and it should be labelled **water**).

Spare materials, including 0.5g samples of recently purchased magnesium powder labelled **magnesium**, and equipment should be available and can be provided without penalty. **Candidates should be made aware of this.**

Question 3

Each candidate will require:

- (i) metre rule with a millimetre scale (see note 1)
- (ii) triangular block to act as a pivot for the metre rule. The block is to stand on the bench
- (iii) piece of modelling clay (e.g. plasticine) of mass approximately 50g (see note 2)
- (iv) balance capable of measuring the mass of the rule to the nearest gram (see note 3).

Notes

1. Check that the metre rule balances on the pivot when the 50.0cm mark is approximately at the pivot.
2. The modelling clay should be pre-worked so that it is easy for the candidate to mould.
3. It is not necessary to provide a balance for each set of apparatus, but candidates must have convenient access to a balance.

Action at Changeover

Place the pivot and the metre rule on the bench. Re-mould the modelling clay into a lump.

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 6.

October/November 2016

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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