



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 2012

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: international@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.

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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, 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 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 international@cie.org.uk, by phone to +44 1223 553554 or by fax to +44 1223 553558.

For question 1

Each candidate will need:

- (i) 30 cm³ full fat milk (not skimmed or semi-skimmed), labelled **milk**
- (ii) 25 cm³ sodium carbonate solution, labelled **sodium carbonate**, concentration about 0.05 mol/dm³
- [N][H]** (iii) phenolphthalein indicator, labelled **phenolphthalein indicator**, with dropping pipette
- (iv) 5 cm³ of a 10 % detergent solution, labelled **bile salts**, (the detergent solution should be a pale or colourless washing-up liquid)
- (v) 5 cm³ of a 5 % lipase solution, labelled **unboiled lipase**, (freshly made up, stored in the refrigerator*)
- (vi) 5 cm³ of a 5 % boiled lipase solution, labelled **boiled lipase**
- (vii) 3 large, hard glass, test-tubes (size 150 x 25 mm) labelled with a permanent marker pen, **A, B and C**
- (viii) 1 test-tube rack or other means of holding tubes
- (ix) 500 cm³ beaker suitable for use as a water bath
- (x) a thermometer, range 0 °C to 100 °C with 1 °C divisions
- (xi) access to hot and cold water to make and maintain a water bath temperature of between 35 °C and 40 °C
- (xii) 5 cm³ of distilled (deionised) water labelled **water**
- (xiii) stopclock or timer with a seconds hand
- (xiv) 2 x 1 cm³ syringes or 5 cm³ syringes, and the means to wash them out (needles are **NOT** required and should **NOT** be given to candidates)
- (xv) 2 x 10 cm³ measuring cylinders
- (xvi) 2 test-tubes (size 125 x 15 mm), labelled with a permanent marker pen, **D and E**
- (xvii) iodine solution, labelled **iodine solution**, with dropping pipette
- [H]** (xviii) about 10 cm³ of biuret solution, labelled **biuret solution**
- (xix) teat pipette or dropper.

*Centres should make up the lipase solution no more than 24 hours in advance and store it in a refrigerator at 4 °C.

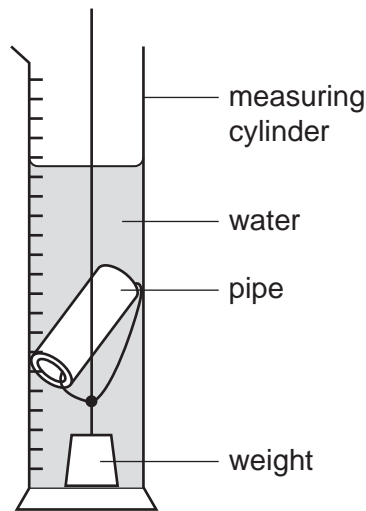
For question 2

Each candidate will need:

- (i) access to a balance accurate to at least 0.1 g
- (ii) 250 cm³ measuring cylinder
- (iii) a piece of plastic pipe/tubing of approximate length 75 mm and external diameter allowing it to fit comfortably into a 250 cm³ measuring cylinder; the wall thickness of the pipe / tubing should be at least 2 mm and the pipe / tubing **must** float in water

Note: a 20 cm³ plastic syringe barrel with the ends cut off could be used.

- (iv) rule at least 15 cm long and with 1 mm divisions
- (v) a metal weight (which could be a slotted weight) that must be capable of being attached to the pipe and then causing the pipe to sink



- (vi) a piece of thread at least 60 cm long
- (vii) paper towels.

For question 3

Each candidate will need:

- (i) a stopclock or timer with a seconds hand
- (ii) a thermometer range 0 °C to 100 °C with 1 °C divisions
- (iii) a transparent (see-through) plastic cup
- (iv) 3 g of fresh zinc powder labelled **A**
- (v) a 25 cm³ measuring cylinder
- [H] (vi) 30 cm³ of copper sulfate solution, CuSO₄.5H₂O, concentration 200 g dm⁻³, labelled **B**
- (vii) a stirring rod.

Note that the heavy metals in this experiment should be disposed of in a way that does not harm the environment.

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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