



Cambridge IGCSE™

CO-ORDINATED SCIENCES

0654/53

Paper 5 Practical Test

October/November 2023

CONFIDENTIAL INSTRUCTIONS



This document gives details of how to prepare for and administer the practical exam.

The information in this document and the identity of any materials supplied by Cambridge International are confidential and must NOT reach candidates either directly or indirectly.

The supervisor must complete the report at the end of this document and return it with the scripts.

INSTRUCTIONS

- If you have any queries regarding these confidential instructions, contact Cambridge International stating the centre number, the syllabus and component number and the nature of the query.
email info@cambridgeinternational.org
phone +44 1223 553554

This document has **8** pages.

General information about practical exams

Centres must follow the guidance on science practical exams given in the *Cambridge Handbook*.

Safety

Supervisors must follow national and local regulations relating to safety and first aid.

Only those procedures described in the question paper should be attempted.

Supervisors must inform candidates that materials and apparatus used in the exam should be treated with caution. Suitable eye protection should be used where necessary.

The following hazard codes are used in these confidential instructions, where relevant:

C	corrosive	MH	moderate hazard
HH	health hazard	T	acutely toxic
F	flammable	O	oxidising
N	hazardous to the aquatic environment		

Hazard data sheets relating to substances used in this exam should be available from your chemical supplier.

Before the exam

- The packets containing the question papers must **not** be opened before the exam.
- It is assumed that standard school laboratory facilities, as indicated in the *Guide to Planning Practical Science*, will be available.
- Spare materials and apparatus for the tasks set must be available for candidates, if required.

During the exam

- It must be made clear to candidates at the start of the exam that they may request spare materials and apparatus for the tasks set.
- Where specified, the supervisor **must** perform the experiments and record the results as instructed. This must be done **out of sight** of the candidates, using the same materials and apparatus as the candidates.
- Any assistance provided to candidates must be recorded in the supervisor's report.
- If any materials or apparatus need to be replaced, for example, in the event of breakage or loss, this must be recorded in the supervisor's report.

After the exam

- The supervisor must complete a report for each practical session held and each laboratory used.
- Each packet of scripts returned to Cambridge International must contain the following items:
 - the scripts of the candidates specified on the bar code label provided
 - the supervisor's results relevant to these candidates
 - the supervisor's reports relevant to these candidates
 - seating plans for each practical session, referring to each candidate by candidate number
 - the attendance register.

Specific information for this practical exam

During the exam, the supervisor (**not** the invigilator) must do the experiments in Questions 1, 3, 4 and 5 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

Question 1

Each candidate will require:

- (i) 10 cm³ of liquidised beans labelled **liquidised beans**. See note 1
- (ii) 10 cm³ of liquidised apple labelled **liquidised apples**. See note 2
- (iii) 5 cm³ of 10 volumes (3%) freshly made hydrogen peroxide labelled **hydrogen peroxide solution**
- (iv) test-tube (approximately 150 × 25 mm) and a means of supporting it
- (v) stirring rod
- (vi) 1 cm³ syringe without needle
- (vii) stop-watch
- (viii) access to distilled water
- (ix) 250 cm³ beaker labelled **waste**
- (x) paper towels.

Notes

1. Beans (e.g. butter beans) should be soaked overnight and then liquidised with sufficient water to make them runny enough to be poured.
2. Peeled and cored apples should be liquidised with sufficient water to make them runny enough to be poured.
3. Prior to the examination, 1 cm depth of liquidised beans should be placed in a test-tube and 1 cm³ hydrogen peroxide added. The mixture should fill the test-tube within 1 to 2 minutes. If this is not the case then the concentration of hydrogen peroxide can be adjusted up to 18 volumes.

For Question 2

No apparatus required.

Question 3

Each candidate will require:

- [MH][N] (i) 6 g of basic copper carbonate mixed with 1 g of copper oxide labelled **compound F**.
See note 1
- (ii) 10 cm³ of 1.0 mol dm⁻³ hydrochloric acid labelled **dilute hydrochloric acid**
- [MH] (iii) 5 cm³ of limewater
- [MH][N] (iv) 10 cm³ of 0.5 mol dm⁻³ ammonia solution in a bottle with a dropper or supplied with a dropping pipette labelled **aqueous ammonia**
- (v) access to balance. See note 2
- (vi) hard-glass test-tube and a means to support it. See note 3
- (vii) test-tube holder to hold hard-glass test-tube
- (viii) boiling tube and a means to support it (approximately 150 mm × 25 mm)
- (ix) test-tube and a means to support it (approximately 125 mm × 16 mm)
- (x) stopper for test-tube
- (xi) stop-watch
- (xii) spatula
- (xiii) Bunsen burner and a means to light it
- (xiv) heatproof mat
- (xv) three wooden splints
- (xvi) red and a blue litmus paper
- (xvii) apparatus the centre uses to test for carbon dioxide
- (xviii) paper towels.

Notes

1. Both compounds must be powdered before mixing and as homogeneous a mixture as possible must be produced. This can be made in a large batch and then distributed to candidates.
2. Candidates need access to a balance with precision of at least 0.1 g. Each candidate will need to use the balance three times. Two of the masses will need to be measured near the beginning of the chemistry questions.
3. The supervisor must label or indicate to the candidates which test-tube is the hard-glass test-tube.

Question 4

Each candidate will require:

- (i) clamp, boss and stand. See note 2
- (ii) pendulum bob attached to approximately 90 cm of thread
- (iii) split cork (or similar) to hold the thread in the clamp
- (iv) metre rule with a millimetre scale
- (v) stop-watch.

Notes

1. The simple pendulum is to be set up for the candidates as shown in Fig. 4.1, with the length of the pendulum (distance from the point of support to the **centre** of the bob) exactly 75.0 cm.

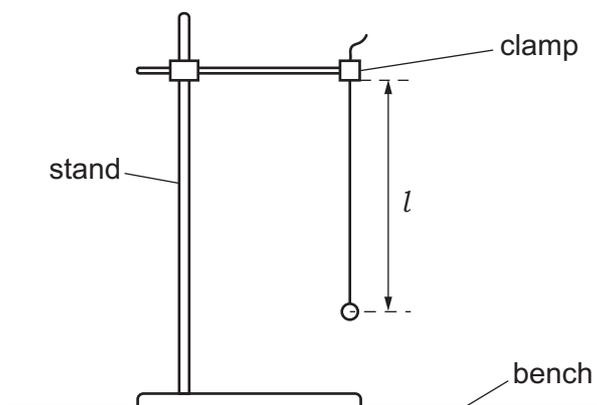


Fig. 4.1

2. Retort stands of 60 cm or less in height may be used if the retort stand is reversed so that the pendulum hangs below the level of the bench. The base of the stand would need to be secured with a G-clamp and/or a weight. Supervisors would need to warn candidates of the difference between this diagram and the set-up of their experiments.

Action at changeover

Reset the pendulum to a length of exactly 75.0 cm.

Question 5

Each candidate will require:

- (i) two 250 cm³ glass beakers labelled **P** and **Q**. See note 1
- (ii) 100 or 250 cm³ measuring cylinder
- (iii) thermometer, –10 °C to 110 °C graduated in 1 °C intervals, suitable for stirring
- (iv) supply of hot water. See notes 2 and 3
- (v) stop-watch.

Notes

1. The beakers should be supplied as shown in Fig. 5.1.

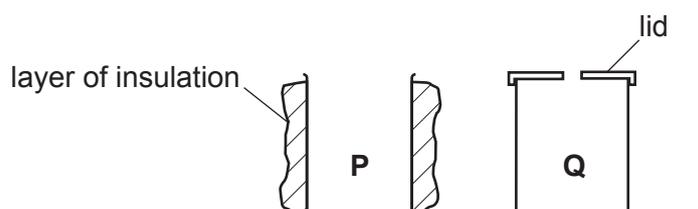


Fig. 5.1

Beaker **P** should have a layer of insulation (e.g., cotton wool, cloth or corrugated cardboard), fastened with rubber bands or tape.

Beaker **Q** should have an insulating lid (e.g., a piece of thick card) in which there is a hole to insert the thermometer.

2. Each candidate will require approximately 400 cm³ of hot water. The hot water should be supplied and maintained at a temperature of approximately 80 °C.
3. Candidates should be warned of the dangers of burns or scalds when using very hot water.
4. Spare beakers and thermometers should be available in case of breakages.

Action at changeover

Remove the thermometer and empty the water from the beakers.

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Supervisor's report

Syllabus and component number

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Centre number

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Centre name

Time of the practical session

Laboratory name/number

Give details of any difficulties experienced by the centre or by candidates (include the relevant candidate names and candidate numbers).

You must include:

- any difficulties experienced by the centre in the preparation of materials
- any difficulties experienced by candidates, e.g. due to faulty materials or apparatus
- any specific assistance given to candidates.

Declaration

- 1 Each packet that I am returning to Cambridge International contains all of the following items:
 - the scripts of the candidates specified on the bar code label provided
 - the supervisor’s results relevant to these candidates
 - the supervisor’s reports relevant to these candidates
 - seating plans for each practical session, referring to each candidate by candidate number
 - the attendance register.
- 2 Where the practical exam has taken place in more than one practical session, I have clearly labelled the supervisor’s results, supervisor’s reports and seating plans with the time and laboratory name/number for each practical session.
- 3 I have included details of difficulties relating to each practical session experienced by the centre or by candidates.
- 4 I have reported any other adverse circumstances affecting candidates, e.g. illness, bereavement or temporary injury, directly to Cambridge International on a *special consideration form*.

Signed (supervisor)

Name (in block capitals)