



Cambridge IGCSE™

COMBINED SCIENCE

0653/52

Paper 5 Practical Test

May/June 2022

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, 2 and 3 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

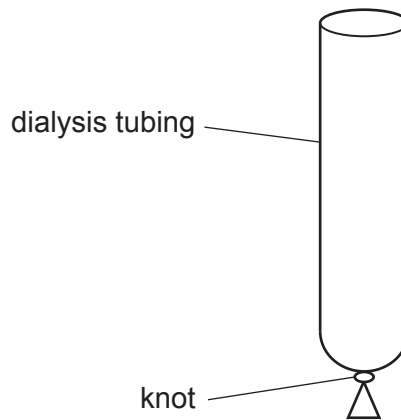
Apparatus and chemicals for Question 1

Each candidate will require the following materials and apparatus. Labels do **not** need to include concentrations.

- 2 × dialysis (visking) tubing, 18–20 cm long, knotted at one end, in a beaker of distilled water (see note 1)
- 30 cm³ of 20% glucose solution in a beaker labelled **glucose** (see note 2)
- 2 × boiling tubes (large test-tubes), 150 mm × 25 mm, and a means to support them
- 1 × 10 cm³ syringe
- forceps
- 100 cm³ distilled water in a beaker labelled **distilled water**
- 150 cm³ cold tap water in a 250 cm³ beaker labelled **cold**
- 150 cm³ hot water in a 250 cm³ beaker labelled **hot** (see note 3)
- means of labelling glassware, e.g. marker pen
- stop-clock (or wall-clock or wrist-watch), to measure to an accuracy of 1 s
- 5 × paper towels
- slice of citrus fruit, presented on a white tile (see note 4)
- access to a balance, measuring to at least ± 0.1 g.

Notes

1. The dialysis tubing should be cut to a length of 18–20 cm and soaked in water for a few minutes. It is then knotted approximately 1 cm from one end as shown in Fig. 1.1. This can be done the day before the exam.

**Fig. 1.1**

2. The glucose solution must be freshly prepared to prevent bacterial growth.
3. The beaker labelled **hot** should be provided with approximately 150 cm³ hot water at a temperature of approximately 50 °C.
4. The fruit can be any citrus fruit such as an orange, lemon or lime. It should be sliced across the middle and presented to candidates in a small dish or on a white tile covered with a damp paper towel.

Apparatus and chemicals for Question 2

Each candidate will require the following materials and apparatus. Labels do **not** need to include concentrations.

- 3 × test-tubes, approximately 125 mm × 16 mm, and a means to support them
- 1 × spatula
- 1 × stirring rod
- 1 × 10 cm³ measuring cylinder
- 1 × dropping pipette
- 1 × test-tube holder suitable for use with a boiling tube
- 1 × thermometer, –10 °C to +110 °C with 1 °C graduations, suitable for stirring
- 1 × 250 cm³ glass beaker labelled **C**
- 1 × 250 cm³ glass beaker labelled **H** for hot water (see notes 1 and 2)
- 1 spatula load of sodium chloride labelled **L**
- 1 spatula load of calcium carbonate powder labelled **M**
- [C][MH][N]** • 1 spatula load of copper(II) sulfate powder labelled **N** (see note 3)
- [O]** • approximately 7 g of potassium nitrate powder in a boiling tube (large test-tube) labelled **Q** (see note 4)
- access to distilled water or deionised water
- paper towels.

Notes

1. Each candidate will need approximately 150 cm³ of very hot water in a beaker labelled **H**. The water should be supplied at a temperature of approximately 80 °C in beaker **H** when the candidate requests it.
2. Candidates should be warned of the dangers of burns or scalds when using very hot water.
3. Use a mortar and pestle and crush any crystals to make a powder.
4. Use a mortar and pestle to crush crystals if powder is not available. Any mass between 6.8 g and 7.2 g will be acceptable.

Apparatus and chemicals for Question 3

Each candidate will require the following materials and apparatus.

- 250 cm³ beaker
- 1 × thermometer, −10 °C to +110 °C with 1 °C graduations, suitable for stirring
- 250 cm³ measuring cylinder
- supply of tap water at room temperature (see note 1)
- supply of hot water (see notes 2 and 3).

Notes

1. The tap water should be left and allowed to reach the temperature of the laboratory prior to the examination. Each candidate will need approximately 200 cm³ of water.
2. Each candidate will need 50 cm³ of very hot water in a 100 cm³ beaker. The water should be supplied at a temperature of approximately 80 °C when the candidate requests it.
3. Candidates should be warned of the dangers of burns or scalds when using very hot water.

Apparatus and chemicals for Question 4

No apparatus or chemicals are required for this question.

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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.

Space for supervisor to record results, if relevant, e.g. temperature of the laboratory; results for Question 1.

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)