Cambridge Assessment International Education

Cambridge IGCSE™

COMBINED SCIENCE **0653/51**

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

DC (LK/JG) 303337/3

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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 and 4 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.

- 5 × beetroot cylinders, 4 cm long with a diameter of approximately 5 mm to 10 mm, in a small beaker labelled **beetroot** and covered with a damp paper towel (see note 1)
- 50 cm^3 of 100% ethanol in a beaker labelled **ethanol**
- 5 × boiling tubes (large test-tubes), approximately 150 mm × 25 mm, and a means to support each boiling tube separately
- 2 × 10 cm^3 syringe
- 100 cm^3 of distilled water in a beaker labelled **distilled water**
- means of labelling glassware, e.g. marker pen
- stop-watch or stop-clock (or wall-clock or wrist-watch), to measure to an accuracy of 1 s
- 1 pair of gloves
- eye protection
- 5 × paper towels
- white tile
- means of cutting beetroot cylinders, such as scalpels, solid edged razor blades or knives.

Note

1. Preparation of materials - The beetroot cylinders should be prepared using a 5 mm–10 mm cork-borer just before the exam. They should be kept damp until given to candidates in a small beaker labelled **beetroot**.

Apparatus and chemicals for Question 2

No apparatus or chemicals are required for this question.

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

Apparatus and chemicals for Question 3

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

- 2 × test-tubes (Pyrex or hard glass), approximately 125 mm × 16 mm, and a means to support them
- 3 × boiling tubes (large test-tubes), approximately 150 mm × 25 mm, and a means to support them
- 2 × dropping pipettes
- 1 × thermometer, –10 °C to +110 °C with 1 °C graduations, suitable for stirring
- wooden splints and a means to light them
- 1 × spatula
- stop-watch or stop-clock (or wall-clock or wrist-watch), to measure to an accuracy of 1 s

[MH]
- 60 cm^3 of 1.0 mol dm^{-3} sulfuric acid labelled **dilute sulfuric acid**
- 5 cm^3 of 0.5 mol dm^{-3} barium nitrate labelled **aqueous barium nitrate**

[MH][N]
- 5 cm^3 of 1.0 mol dm^{-3} dilute nitric acid labelled **dilute nitric acid**
- 1 g of sodium hydrogencarbonate labelled **sodium hydrogencarbonate**

[C]
- 25 cm^3 of 2.0 mol dm^{-3} sodium hydroxide labelled **aqueous sodium hydroxide**

[F]
- 2 × 25 mm strips of magnesium ribbon
- small ruler that measures in cm
- access to distilled water or deionised water
- paper towels.

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

Apparatus and chemicals for Question 4

Each candidate will require the following apparatus and materials.

- stand, boss and clamp (see note 1)
- metre rule (see note 1)
- a spring (see note 2)
- a 100 g slotted mass hanger and an additional 4 × 100 g slotted masses
- an object with a mass of approximately 250–280 g labelled **O** (see note 3).

Notes

1. The apparatus should be set up as shown in Fig. 4.1. The metre rule is clamped so that the spring hangs next to the scale and the scale is visible to candidates.

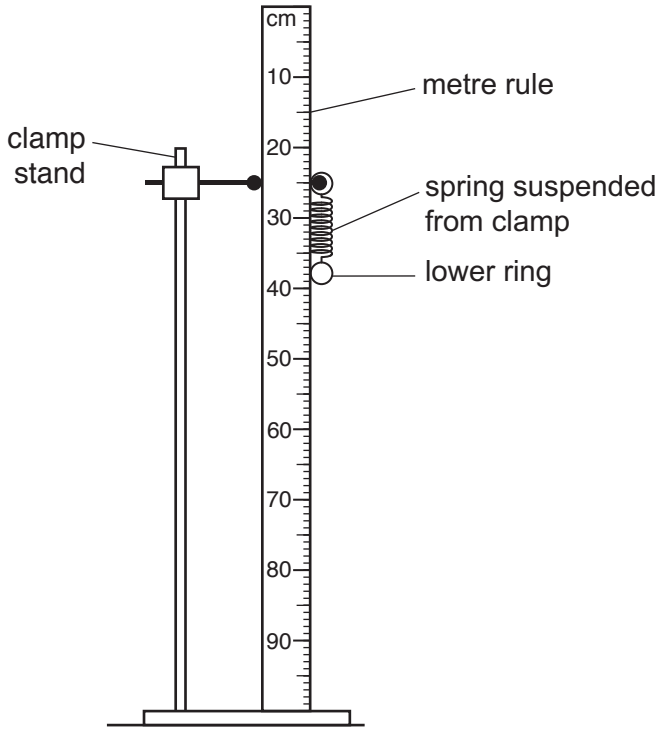

Fig. 4.1

2. An expendable steel spring is suitable, for example a 55 mm long spring of diameter 15.5 mm (see https://www.philipharris.co.uk/, catalogue number B8G87194). The spring must be capable of supporting at least 600 g without overstretching.

3. The object **O** must be supplied with a light hook so that it can be suspended from the spring. The mass of the object must be unknown to the candidates.

4. Action at changeover. Restore apparatus as in Fig. 4.1. Check that the spring has not been overstretched. Replace the spring if necessary.

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Supervisor's report

Syllabus and component number | | | | | / | | |

Centre number | | | | | |

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.

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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) .....