Cambridge Assessment International Education

Cambridge IGCSE™

COMBINED SCIENCE **0653/51**

Paper 5 Practical Test **May/June 2025**

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 (CJ/JG) 346270/2

[Turn over

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'.

Question 1

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

hazard	materials and apparatus	quantity per candidate
	1% albumin solution in a beaker, labelled **A** (see note 1.1)	at least 10 cm^3
	1% albumin and 1% starch solution in a beaker, labelled **B** (see note 1.2)	at least 10 cm^3
	distilled water in a beaker, labelled **C**	at least 10 cm^3
[MH] [N]	iodine solution in a container, labelled **iodine solution** (see note 1.3)	at least 10 cm^3
[C]	biuret solution in a container, labelled **biuret solution** (see note 1.4)	at least 10 cm^3
	5 cm^3 syringes	4
	dropping pipette	1
	test-tubes and a means to support them (see note 1.5)	6
	access to paper towels	

Notes

1.1 The 1% albumin solution **A** is prepared by adding 1.0 g of albumin powder to a small quantity of warm distilled water and mixing to a paste. Make up to 100 cm^3 with warm distilled water, stirring constantly until dissolved.

1.2 The 1% albumin and 1% starch solution **B** is prepared by adding 1.0 g of albumin powder and 1.0 g soluble starch to a small quantity of warm distilled water and mixing to a paste. Make up to 100 cm^3 with warm distilled water, stirring constantly until dissolved.

1.3 Commercially available iodine solution for food testing is suitable.

1.4 Commercially available biuret solution for food testing is suitable.

1.5 Test-tubes should be approximately 125 mm × 16 mm. They must be supported in a test-tube rack or appropriately sized beaker.

Action at changeover

Replace all the chemicals and apparatus. Remove all the reaction mixture residues.

Question 2

No materials or apparatus 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'.

Question 3

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

hazard	materials and apparatus	quantity per candidate
	2.00 mol dm^{-3} dilute hydrochloric acid, labelled **H**	90 cm^3
[F]	magnesium ribbon, labelled **magnesium ribbon** (see note 3.1)	4
[C]	1.0 mol dm^{-3} nitric acid, labelled **dilute nitric acid** (see note 3.2)	10 cm^3
	0.1 mol dm^{-3} barium nitrate, labelled **barium nitrate** (see note 3.2 and 3.5)	5 cm^3
	0.05 mol dm^{-3} aqueous silver nitrate, labelled **silver nitrate** (see note 3.2)	5 cm^3
[F]	universal indicator, labelled **universal indicator** (see note 3.3)	2 cm^3
	100 cm^3 glass beaker	1
	glass stirring rod	1
	supply of distilled water	
	25 cm^3 measuring cylinder	2
	10 cm^3 measuring cylinder	1
	stop-watch or stop-clock that can measure to the nearest second	1
	means of writing on glassware, e.g. wax pencils or water-resistant marker pens	1
	dropping pipette	5
	test-tubes and a means to support them (see note 3.4)	3
	waste container, labelled **waste** (see note 3.6)	
	access to paper towels	

Notes

3.1 The magnesium ribbon must be cut into 30 mm length pieces.

3.2 The solutions can be supplied in communal samples but no more than four candidates to share each sample. Arrangements must be made to ensure that the samples do **not** become contaminated. Candidates need to have separate dropping pipettes for each solution.

3.3 Universal indicator should be provided in a container with a dropper or pipette. The solution can be supplied in communal samples but no more than four candidates to share each sample. Arrangements must be made to ensure that the samples do **not** become contaminated.

3.4 Test-tubes should be approximately 125 mm × 16 mm. They must be supported in a test-tube rack or appropriately sized beaker.

3.5 Barium chloride can be substituted for barium nitrate but must be labelled barium nitrate.

3.6 The waste container can be a large beaker or any other suitable container for collecting the reaction mixture residues.

Action at changeover

Replace all the chemicals and apparatus. Remove all the reaction mixture residues.

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'.

Question 4

Each candidate will require the following materials and apparatus.

hazard	materials and apparatus	quantity per candidate
	stand, boss and clamp (see note 4.1)	1
	split cork or two thin pieces of wood to hold the string in the clamp	1
	pendulum bob attached to approximately 70 cm of string	1
	stop-watch with a resolution of 0.01 s	1
	metre ruler, graduated in mm	1

Notes

4.1 The simple pendulum is to be set up for the candidates with the distance between the point of the support and the centre of the bob 40.0 cm as shown in Fig. 4.1.

The point of support should be 55.0 cm above the bench. (The centre of the bob should be 15.0 cm above the bench.)

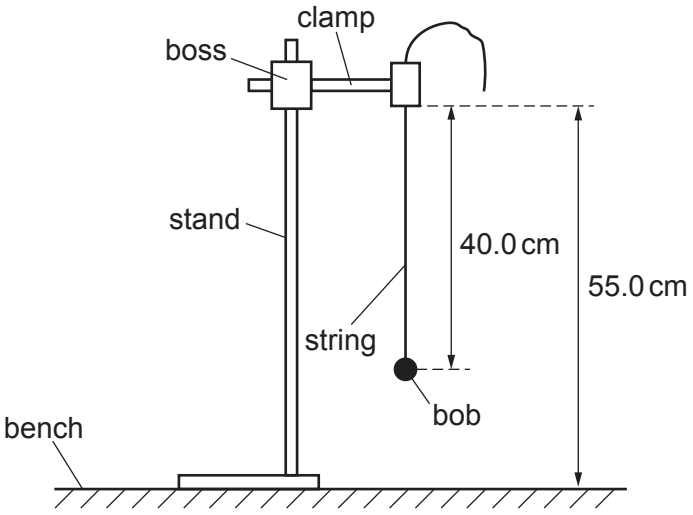

Fig. 4.1

The bob should swing above the bench and **not** above the base of the stand.

Action at changeover

If the apparatus is to be used by another candidate, then it should be restored to its original state.

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.

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) .....