Cambridge Assessment International Education

Cambridge IGCSE™

CO-ORDINATED SCIENCES **0654/51**

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

This document has **12** pages. Any blank pages are indicated.

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, 3, 5 and 6 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
	agar cubes, 1 cm × 1 cm × 1 cm, stained with universal indicator (UI) to give a green or blue colour (see note 1.1)	2
	1.0 mol dm^{-3} hydrochloric acid in a beaker, labelled **dilute hydrochloric acid**	200 cm^3
	100 cm^3 beakers	2
	stop-watch	1
	white tile	1
	cutting blade	1
	30 cm ruler graduated in mm	1
	tweezers (see note 1.2)	1
	paper towels	2

Notes

1.1 The agar can be made up using 2% technical agar (do not use nutrient agar) and stained with sufficient UI to give a green/blue colour. A few drops of 1.0 mol dm^{-3} NaOH can be added to obtain the green/blue colour (approximately pH 8).

1.2 Any other means of holding the cubes is acceptable.

Question 2

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

hazard	materials and apparatus	quantity per candidate
	yeast suspension in a test-tube, labelled **yeast** (see note 2.1)	5 cm^3
	apple puree in a test-tube, labelled **apple** (see note 2.2)	5 cm^3
	10 volume (3%) freshly prepared hydrogen peroxide in a container that can be accessed with the syringe, labelled **hydrogen peroxide**	5 cm^3
	test-tubes (approximately 125 mm by 16 mm)	2
	test-tube rack	1
	30 cm ruler graduated in mm	1
	1 cm^3 syringe without needle	1
	glass stirring rod	1
	paper towels	2
	stop-watch	1
	access to distilled or deionised water	

Notes

2.1 The yeast suspension can be made by mixing 5 g active dried yeast with 100 cm^3 distilled/deionised water **without** any sugar. It must be made up fresh not more than 60 minutes before the exam and kept at 35–40 °C.

2.2 The apple puree can be made by liquidising peeled cored uncooked apples with sufficient distilled/deionised water to make it runny enough to be poured.

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
[MH]	0.2 mol dm^{-3} sodium hydroxide, labelled **J**	70 cm^3
	0.1 mol dm^{-3} sodium hydroxide, labelled **K**	70 cm^3
	0.2 mol dm^{-3} hydrochloric acid, labelled **hydrochloric acid**	100 cm^3
[F][MH] [HH]	access to bromothymol blue indicator, labelled **bromothymol blue** supplied in bottle with a dropper (see notes 3.1 and 3.2)	
	50 cm^3 burette	1
	25 cm^3 measuring cylinders	2
	250 cm^3 conical flasks	2
	funnel to fill burette	1
	stand, boss and clamp or a burette stand	1
	white tile	1
	access to distilled or deionised water	
	paper towels	2

Notes

3.1 To make up bromothymol blue: 0.4 g in 200 cm^3 ethanol made up to 1 dm^3 with water.

3.2 The bromothymol blue indicator may be shared between no more than 4 candidates.

[Turn over

Question 4

No materials or apparatus are required for this question.

Question 5

Each candidate will require the following materials and apparatus.

hazard	materials and apparatus	quantity per candidate
	250 cm^3 glass beaker containing 200 cm^3 of water	1
	50 cm^3 measuring cylinder	1
	solid glass marbles approximately 1.5 cm in diameter (see note 5.1)	5
	access to a balance capable of measuring to the nearest 0.1 g	
	paper towels for spillages	2

Notes

5.1 The marbles must be able to fit into the measuring cylinder and be fully submerged beneath the water level if 25 cm^3 of water is added to the measuring cylinder.

Action at changeover

Provide dry marbles and a dry measuring cylinder.

[Turn over

Question 6

Each candidate will require the following materials and apparatus.

hazard	materials and apparatus	quantity per candidate
	approximately 70 cm string (see note 6.1)	1
	metre ruler capable of measuring to the nearest 0.1 cm	1
	stop-clock/stop-watch capable of measuring to the nearest 0.1 s	1
	pendulum bob or blob of modelling clay that can act as a pendulum bob (see note 6.1)	1
	stand, boss and clamp (see note 6.1)	1

Notes

6.1 A pendulum should be set up for each candidate as shown in Fig. 6.1.

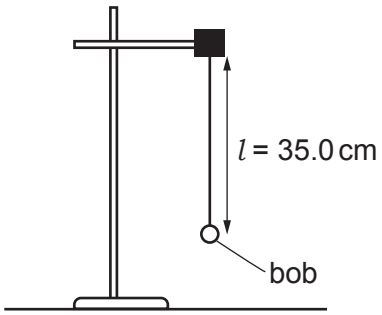

Fig. 6.1

6.2 The distance l from the point of suspension to the middle of the pendulum bob should be 35.0 cm.

6.3 To make an obvious start for the string, the string can be tied around the rod of the clamp or clamped between two pieces of wood.

Action at changeover

Reset the apparatus and ensure l = 35.0 cm.

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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.

Space for supervisor to record results, where relevant.

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) .....