



Cambridge IGCSE™

COMBINED SCIENCE

0653/52

Paper 5 Practical Test

May/June 2021

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. 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 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.

- 30 cm³ of 10% yeast suspension in a beaker labelled **yeast suspension** (see note 1)
- 20 cm³ of 5% glucose solution in a beaker labelled **5% glucose solution**
- 20 cm³ distilled water in a beaker labelled **water**
- three × 5 cm³ syringes
- one × 1 cm³ syringe
- six small test-tubes, approximately 125 mm × 16 mm and a means to support them
- large beaker labelled **water-bath**
- supply of hot and cold water to maintain a water-bath at around 40 °C
- thermometer, –10 °C to 110 °C with 1 °C graduations
- stop-clock
- means of labelling glassware
- 5 cm³ of 0.1% methylene blue in a small beaker labelled **methylene blue**
- glass rod

Notes

1. The yeast suspension should be prepared shortly before the practical using 10 g dried baker's yeast suspended in 100 cm³ water at around 30 °C to 40 °C.

Apparatus and chemicals for Question 2

Each candidate will require the following materials and apparatus.

- one × small test-tube (approximately 125 mm × 16 mm) and a means to support it
 - two × large test-tubes (boiling tubes) (approximately 150 mm × 25 mm) and a means to support them
 - spatula
 - thermometer, -10 to 110°C with 1°C graduations (see note 1)
 - test-tube holder to use with large test-tube
 - about 2 g of ammonium sulfate labelled **solid F**
- [F]
- 1 cm^3 of full-range Universal Indicator solution labelled **Universal Indicator** (see note 2)
 - pH colour chart suitable for use with the Universal Indicator solution supplied
- [C]
- 5 cm^3 of 1.0 mol dm^{-3} sodium hydroxide labelled **aqueous sodium hydroxide**
 - strip of red litmus paper
 - access to deionised or distilled water
 - Bunsen burner and a means to light it
 - heat proof mat
 - paper towels

Notes

1. The thermometer can be between $0-100^{\circ}\text{C}$ but must be suitable for stirring a solid in a liquid
2. There should be a dropping pipette available for the Universal Indicator. If a communal bottle of Universal Indicator is provided for several candidates to use then it must be fitted with an integral dropper to prevent contamination.

Apparatus and chemicals for Question 3

No apparatus or chemicals are required for this question.

Apparatus and chemicals for Question 4

Each candidate will require the following materials and apparatus.

- a d.c. power supply of approximately 1.5V to 2V (see note 1)
- an ammeter capable of measuring up to 1.00A with a minimum resolution of 0.05A
- a voltmeter capable of measuring up to 2.5V with minimum resolution of 0.1V
- a switch (the switch may be an integral part of the power supply)
- a wooden or plastic metre rule
- approximately 105cm of straight, bare constantan wire of diameter 0.27 mm (32 swg), taped to a metre rule at two places (between the zero and 5.0 cm mark and between the 95.0 cm and 100.0 cm mark). The zero end of the wire is to be labelled **X**. In addition, the zero end of the wire must be taped over up to the 10.0 cm mark to prevent candidates attaching the crocodile clip in this area
- a sliding contact, labelled **C**, this should be a crocodile clip attached to a lead
- connecting leads (see note 2)

Notes

1. If candidates are supplied with a power source of variable voltage output, the voltage should be set by the supervisor and fixed, e.g. taped. If dry cells are used as the power source, check that they remain adequately charged during the examination. Spare cells should be available.
2. The circuit shown in Fig. 4.1 below must be set up for the candidates. The crocodile clip must **not** be connected to the resistance wire.

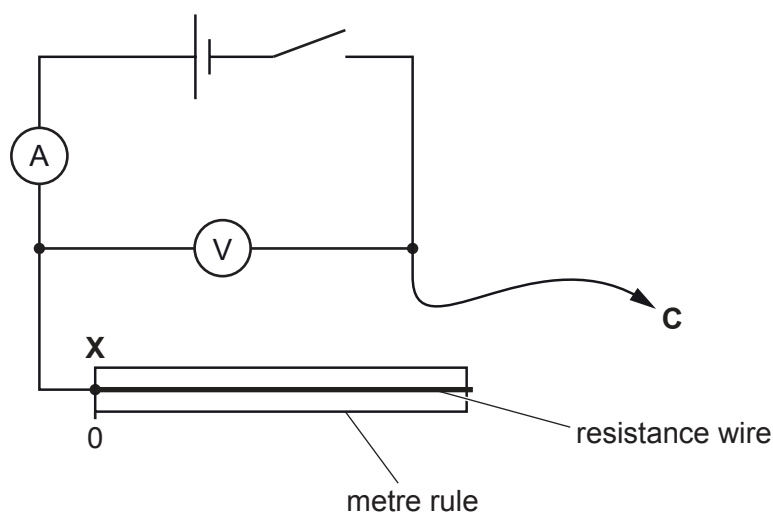


Fig. 4.1

3. At changeover check that the circuit is still connected correctly and working.

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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)