



CO-ORDINATED SCIENCES

0654/52

Paper 5 Practical Test

May/June 2019

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.

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.

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This document consists of **10** printed pages and **2** blank 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, 3, 4, 5 and 6 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

For Question 1

Each candidate will require:

- (i) white spotting tile
- (ii) two test-tubes (125 mm × 15 mm) and a means of supporting them
- [C] (iii) biuret solution and dropping pipette, labelled **biuret solution**
- [MH] [N] (iv) iodine solution and dropping pipette, labelled **iodine solution**
- (v) approximately 5 cm³ 5% starch solution, labelled **solution A**, with a dropping pipette (see note 1)
- (vi) approximately 10 cm³ egg albumin solution, labelled **solution B**, with a dropping pipette (see note 1).

Note

Solutions **A** and **B** should be freshly made no more than 24 hours prior to the exam and refrigerated.

For Question 2

Each candidate will require:

- (i) approximately 80 cm³ 0.1 mol dm⁻³ hydrochloric acid labelled **hydrochloric acid**
- [MH] (ii) approximately 50 cm³ 0.2 mol dm⁻³ sodium hydroxide solution labelled **sodium hydroxide**
- [F] (iii) Universal Indicator solution with dropping pipette labelled **Universal Indicator**
- (iv) access to colour chart for the Universal Indicator solution
- (v) 1 large test-tube (approx. 150 mm × 25 mm) with a clear mark at the 20 cm³ level and the number 20 by it
- (vi) 25 cm³ measuring cylinder with 0.5 cm³ graduations (see note 1)
- (vii) dropping pipette long enough to go into the measuring cylinder
- (viii) 100 cm³ beaker
- (ix) stirring rod.

Note

The Supervisor should record on the Supervisor's Results the graduations on the 25 cm³ measuring cylinder if not 0.5 cm³.

For Question 3

Each candidate will require:

- (i) d.c. power supply of approximately 1.5V to 2V. If candidates are supplied with a power source of variable voltage output, the voltage should be set by the supervisor and fixed, for example using tape (see notes 1 and 2)
- (ii) voltmeter capable of measuring up to 2.5V with minimum resolution of 0.1 V (see note 3)
- (iii) ammeter capable of measuring up to 1.00A with a minimum resolution of 0.02A (see note 3)
- (iv) resistor of nominal value $4.7\ \Omega$, labelled **R** with a power rating of at least 2W
- (v) switch (the switch may be an integral part of the power supply)
- (vi) a wooden or plastic metre rule graduated in millimetres
- (vii) approximately 100 cm of straight, bare constantan wire of diameter 0.27 mm (32 swg), taped to a metre rule at two places between the 0 cm 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 **P** and the other end **Q**)
- (viii) sliding contact, labelled **C** (this should be a crocodile clip attached to a lead)
- (ix) two terminals, e.g. crocodile clips, attached to the constantan wire at the ends of the metre rule so that connections can be made to the circuit shown in Fig. 3.1.

Notes

- 1 The circuit shown in Fig. 3.1 must be set up for the candidates.

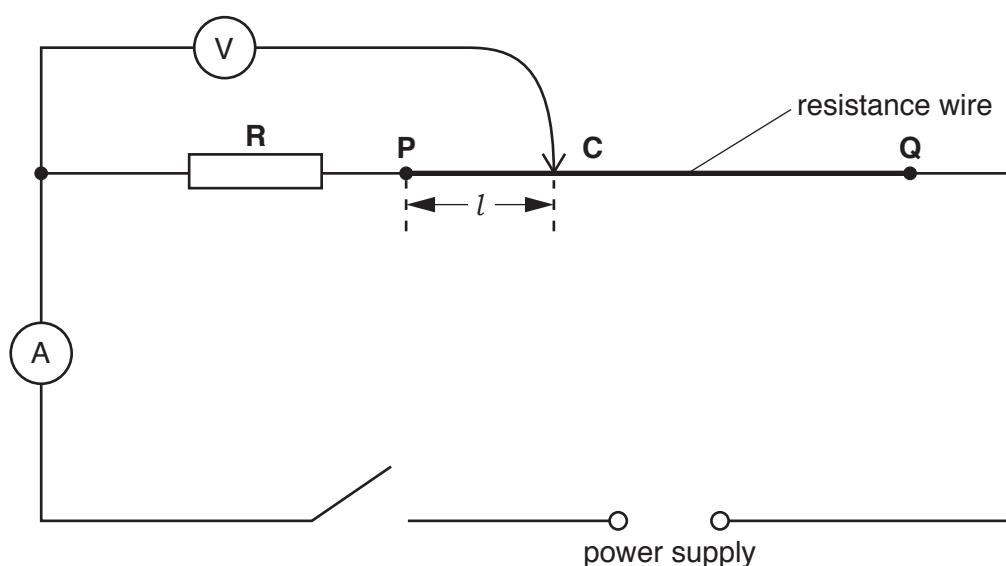


Fig. 3.1

- 2 If dry cells are used as the power source, check that they remain adequately charged during the examination. Spare cells should be available.
- 3 Either analogue or digital meters are suitable. Any variable settings should be set by the Supervisor and fixed (e.g. taped).

Action at Changeover

Check that the circuit is still connected correctly, working and switched off.

For Question 4

Each candidate will require:

- (i) a nut of approximately 3–5cm in diameter and approximately spherical, still in its shell
e.g. a walnut
- (ii) a piece of string of approximately 30cm in length
- (iii) 30cm ruler graduated in mm.

For Question 5

Each candidate will require:

- (i) approximately 40 cm³ 2.0 mol dm⁻³ hydrochloric acid labelled **hydrochloric acid**
- (ii) approximately 1 cm³ detergent with a dropping pipette labelled **detergent**
- (iii) 40 marble chips (size 2–4 mm) labelled **marble chips** (see note 1)
- (iv) 1 test-tube (approx. 125 mm × 15 mm)
- (v) 1 large test-tube (approx. 150 mm × 25 mm)
- (vi) delivery tube with bung to fit large test-tube in (v)
- (vii) beaker to support test-tube in (iv)
- (viii) 10 cm³ measuring cylinder
- (ix) stirring rod
- (x) small beaker
- (xi) stopclock
- (xii) large beaker labelled **waste**.

Note

Marble chips should give a vigorous reaction with 2.0 mol dm⁻³ hydrochloric acid.

For Question 6

Each candidate will require:

- (i) 250 cm³ glass beaker
- (ii) 100 or 250 cm³ measuring cylinder
- (iii) thermometer –10°C to 110°C graduated in 1°C intervals
- (iv) supply of hot water (see notes 1 and 2)
- (v) stopwatch.

Notes

- 1 Each candidate will require approximately 400 cm³ of hot water. The hot water should be supplied and maintained at a temperature of approximately 80°C or higher.
- 2 Candidates should be warned of the dangers of burns or scalds when using very hot water.
- 3 Spare beakers and thermometers should be available in case of breakages.

Action at Changeover

Remove the thermometer and empty the water from the beaker.

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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.

Declaration

- 1 Each packet that I am returning to Cambridge International contains 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)