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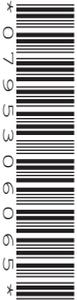
PHYSICS

0625/53

Paper 5 Practical Test

October/November 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

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.

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 experiment in Question 1 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

Question 1

Items to be supplied by the centre (per set of apparatus unless otherwise specified)

- (i) Glass boiling tube, approximately 50 cm³ capacity. See note 1.
- (ii) Clamp, boss and stand. See note 2.
- (iii) Metre rule, graduated in mm. See note 3.
- (iv) 100 cm³ measuring cylinder. See note 4.
- (v) Dropping pipette capable of holding at least 3 cm³ of water. A disposable polythene graduated pipette (e.g. Philip Harris B8A77744, www.philipharris.co.uk) is suitable. See note 4.
- (vi) Supply of cold water. See note 5.
- (vii) Set square. Candidates may use their own.
- (viii) Paper towels to mop up water spills.

Notes

1. A glass boiling tube, approximately 24 mm in diameter and 150 mm in length, is suitable (e.g. Philip Harris B8A85558, www.philipharris.co.uk). Any alternative must be recorded in the supervisor's report.
2. The clamp, boss and stand must be set up with the boiling tube supported by the clamp. The clamp must be just below the rim of the boiling tube. The bottom of the boiling tube should be between 5 cm and 10 cm above the bench.
3. If the metre rule has two scales in opposite directions, one scale must be taped over.
4. A dropping pipette graduated in 1.0 cm³ or 0.5 cm³ is preferable but an ungraduated pipette may also be used in conjunction with the measuring cylinder.
The dropping pipette must be able easily to reach the 50 cm³ level of the measuring cylinder.
5. The temperature of the water is not important. Each candidate will require approximately 100 cm³ of water.

Action at changeover

Empty the water from the boiling tube and ensure that the boiling tube is intact.
Ensure the apparatus is arranged as described in note 2.

Question 2

Items to be supplied by the centre (per set of apparatus unless otherwise specified)

- (i) Thermometer: -10°C to 110°C , graduated in 1°C intervals. See note 1.
- (ii) Clamp, boss and stand. See note 1.
- (iii) 250 cm^3 beaker labelled **beaker A**. See note 2.
- (iv) 250 cm^3 beaker labelled **beaker B**. See note 2.
- (v) Lid for each beaker. See note 3.
- (vi) Supply of hot water. See notes 4 and 5.
- (vii) Stop-clock or stop-watch or wall-mounted clock showing seconds. Candidates will be required to take readings at 30-second intervals. The question will refer to a stop-clock.
- (viii) Paper towels to soak up any water spills.

Notes

1. The thermometer, clamp, boss and stand are to be set up for candidates as shown in Fig. 2.1. The thermometer bulb must be below the 100 cm^3 level of the beakers. Candidates must be able easily and safely to read temperatures up to 100°C and to move the thermometer into and out of the beakers.

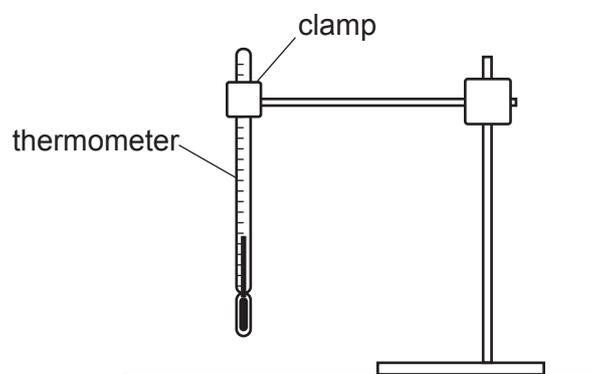


Fig. 2.1

2. The vertical sides of beaker A must be tightly covered with a thin layer of matt black card. The vertical sides of beaker B must be tightly covered with a layer of metal foil, with the shinier side on the outside. The base of each beaker must **not** be covered with card or foil. Beaker A and beaker B must each have a clear mark at the 150 cm^3 level which can be read from inside the beaker.
3. The lids may be made from any insulating material. Thick card is suitable. There must be a small hole to allow the thermometer to be inserted.
4. Hot water is to be available for each candidate throughout the experiment. The hot water should be maintained at an approximately constant temperature between 80°C and 100°C . Each candidate will require approximately 350 cm^3 of hot water in total. Candidates must be able to pour hot water into and out of the beaker safely.

5. Candidates must be warned of the dangers of burns or scalds when using very hot water.
6. Spare lids and thermometers must be available.

Action at changeover

Empty water from the beakers if necessary.

Check that the apparatus is intact and is arranged as in Fig. 2.1.

Replace the lids if necessary.

Question 3

Items to be supplied by the centre (per set of apparatus unless otherwise specified)

- (i) Three 2W resistors, labelled **P**, **Q** and **S**. Resistor **P** must be $5\ \Omega$, resistor **Q** must be $2\ \Omega$ and resistor **S** must be $3\ \Omega$. See note 2.
- (ii) Power supply of approximately 2–3 V. See note 3.
Where candidates are provided with a variable power supply, the voltage should be set by the supervisor and fixed, e.g. taped.
- (iii) Switch. The switch may be an integral part of the power supply.
- (iv) Sufficient connecting leads to set up the circuit shown in Fig. 3.1 and two extra leads.
- (v) Ammeter capable of measuring currents up to 1.00 A with a resolution of at least 0.02 A. See note 4.
- (vi) Voltmeter capable of measuring the potential difference of the supply with a resolution of at least 0.1 V. See note 4.

Notes

1. The circuit is to be set up for candidates as shown in Fig. 3.1. Candidates must be able easily and quickly to disconnect and connect circuit components.
The circuit should be switched off.

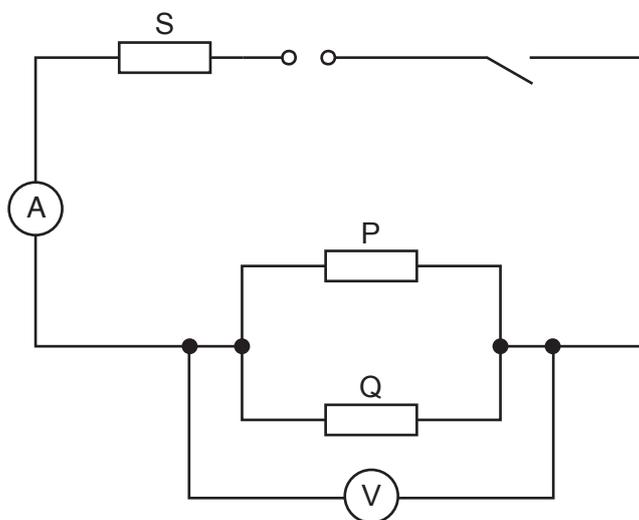


Fig. 3.1

2. Candidates must not be able to identify the resistance values.
Spare resistors must be available.
3. If cells are used, they must remain adequately charged throughout the examination. Spare cells must be available.

4. Either analogue or digital meters are suitable. Any variable settings should be set by the supervisor and fixed, e.g. taped.

Action at changeover

Connect the circuit as shown in Fig. 3.1 and check that the circuit is working.
Switch the circuit off.

Question 4

No apparatus is required for this question.

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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 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)