



# Cambridge IGCSE™

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**PHYSICS**

**0625/53**

Paper 5 Practical Test

**October/November 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.**

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## 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](mailto:info@cambridgeinternational.org)  
phone      +44 1223 553554

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This document has **8** 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.

### 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

### Question 1

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

- (i) Thermometer:  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ , graduated in  $1^{\circ}\text{C}$  intervals. See note 1.
- (ii) Clamp, boss and stand. See note 1.
- (iii)  $250\text{ cm}^3$  beaker labelled '**beaker A**'. See notes 2 and 3.
- (iv)  $250\text{ cm}^3$  beaker labelled '**beaker B**'. See note 3.
- (v) Lid for each beaker. See note 4.
- (vi) Supply of hot water. See notes 5 and 6.
- (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. 1.1. The thermometer bulb must be below the  $100\text{ cm}^3$  level of the beakers. Candidates must be able easily and safely to read temperatures up to  $100^{\circ}\text{C}$  and to move the thermometer into and out of the beakers.

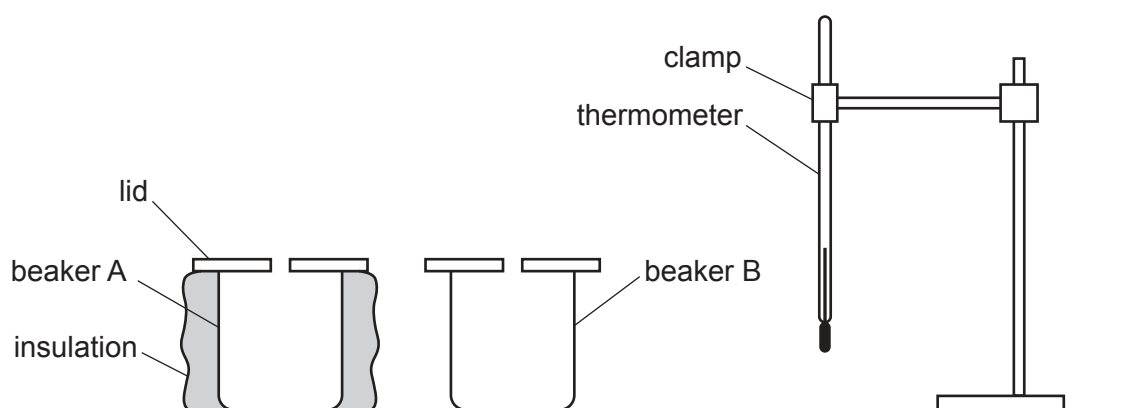


Fig. 1.1

2. The sides of beaker A must be covered with a thick layer of insulating material. Cotton wool is suitable.
3. Beaker A and beaker B must have clear marks at the  $150\text{ cm}^3$  level which can be read from inside the beaker.
4. 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.

5. 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 about 350 cm<sup>3</sup> of hot water in total. Candidates must be able to pour hot water into and out of the beaker safely.
6. Candidates must be warned of the dangers of burns or scalds when using very hot water.
7. 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. 1.1.

Replace the lids if necessary.

### Question 2

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

- (i) Two resistance wires, each between 1.05 m and 1.10 m in length, labelled '**resistance wire A**' and '**resistance wire B**'. See notes 1 and 2.
- (ii) Metre rule graduated in mm. See note 2.
- (iii) Crocodile clip.
- (iv) Power supply of approximately 2V–3V. See note 4.  
Where candidates are provided with a variable power supply, the voltage should be set by the supervisor and fixed, e.g. taped.
- (v) 2 Ω, 2W resistor.
- (vi) Switch. The switch may be an integral part of the power supply.
- (vii) Sufficient connecting leads to set up the circuit shown in Fig. 2.1.
- (viii) Ammeter capable of measuring currents up to 1.00A with a minimum resolution of 0.05A. See note 5.
- (ix) Voltmeter capable of measuring up to 3.0V with a minimum resolution of 0.1V. See note 5.
- (x) Spare leads and crocodile clips.

### Notes

1. Resistance wire A must be 28 swg (0.376 mm diameter) nickel-chromium or any other wire with a resistance of approximately 10 Ω/m.

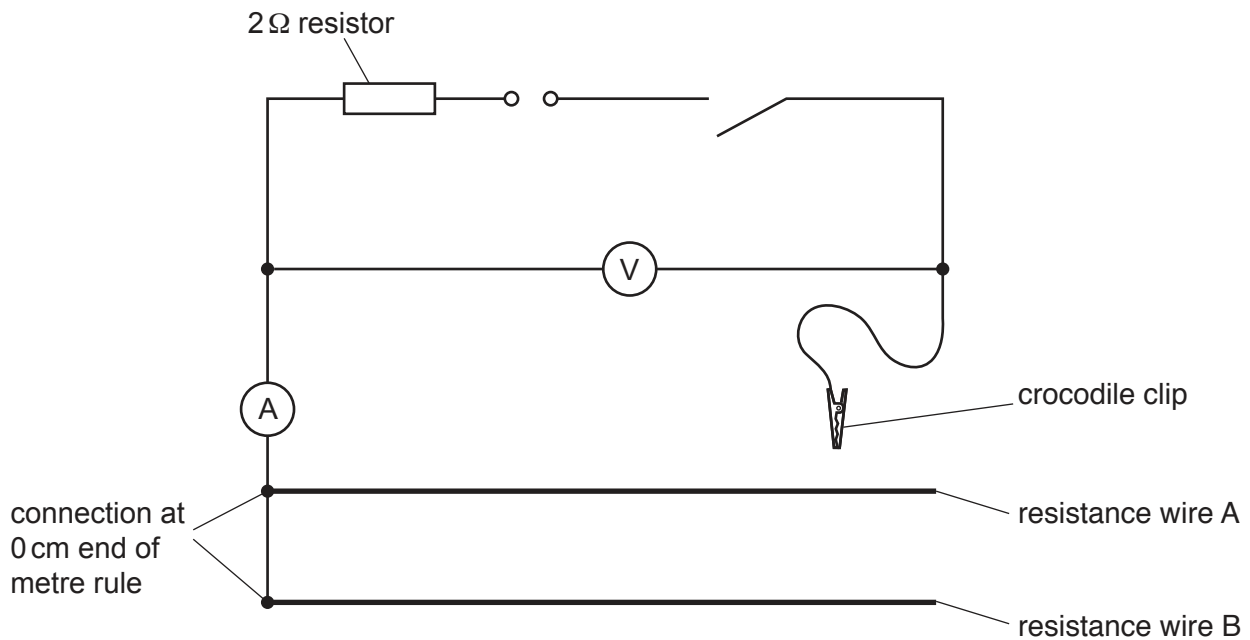
Resistance wire B must be 30 swg (0.315 mm diameter) constantan (Eureka) or any other wire with a resistance of approximately 6 Ω/m.

2. The wires must be fixed to the metre rule in such a way as to allow candidates to connect a crocodile clip to points between the 45.0 cm and 95.0 cm marks. The wires at the 0 cm end of the metre rule should be connected to the ammeter, as shown in Fig. 2.1.

Transparent tape must be used to tape over the wire between the 0.0 cm and 25.0 cm marks to prevent connection of the crocodile clip to this section.

If the metre rule has two scales in opposite directions, one scale must be taped over.

3. The circuit is to be set up for candidates as shown in Fig. 2.1. The crocodile clip must not be connected to either resistance wire.



**Fig. 2.1**

4. If cells are used, they must remain adequately charged throughout the examination. Spare cells must be available.
5. Either analogue or digital meters are suitable. Any variable settings must be set by the supervisor and fixed, e.g. taped.

### Action at changeover

Ensure that the circuit is connected as shown in Fig. 2.1. Check that the circuit is working and disconnect the crocodile clip from the resistance wire. Open the switch.

### Question 3

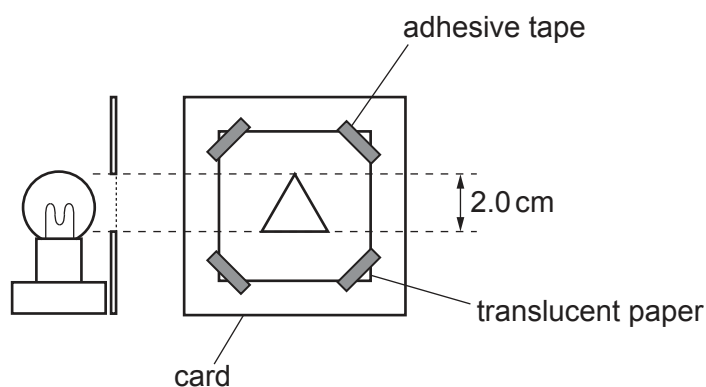
**Items to be supplied by the centre (per set of apparatus, unless otherwise specified)**

- (i) Converging lens of focal length between 14 cm and 16 cm with a suitable holder.
- (ii) Metre rule, graduated in mm.

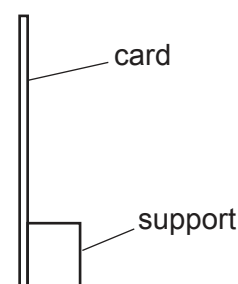
- (iii) Illuminated object consisting of a rigid card with a triangular hole of height 2.0 cm (see Fig. 3.1). The hole is to be covered with thin translucent paper (e.g. tracing paper) secured with adhesive tape. See note 1.
- (iv) Plain white screen. A white sheet of stiff card approximately 150 mm × 150 mm, fixed to a wooden support, is suitable (see Fig. 3.2).
- (v) 30 cm ruler, graduated in mm. Candidates may use their own.

### Notes

1. The lamp used for the illuminated object should be low voltage, 24 W or greater, with a suitable power supply.
2. The lamp filament, the centre of the hole which forms the object and the centre of the lens in its holder must all be the same height above the bench.
3. The apparatus should be situated away from direct sunlight.



**Fig. 3.1**



**Fig. 3.2**

### Action at changeover

Check that the apparatus is intact and that the lamp is working.  
 Replace or re-cover the screen if it has been marked.  
 Switch off the lamp.

### 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) .....