



# Cambridge IGCSE™ (9–1)

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**PHYSICS**

**0972/05**

Paper 5 Practical Test

**For examination from 2023**

SPECIMEN 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 **10** 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:

<b>C</b>	corrosive	<b>MH</b>	moderate hazard
<b>HH</b>	health hazard	<b>T</b>	acutely toxic
<b>F</b>	flammable	<b>O</b>	oxidising
<b>N</b>	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 3 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) 250 cm<sup>3</sup> beaker. See notes 1 and 3.
- (ii) Two lids to fit the beaker, labelled **A** and **B**. See note 2.
- (iii) Thermometer: –10 °C to 110 °C, graduated in 1 °C intervals. See note 1.
- (iv) Clamp, boss and stand. See note 1.
- (v) Stopwatch or stopclock or wall-mounted clock showing seconds. Candidates will be required to take readings at 30-second intervals. They may use their own wristwatches. The question will refer to a stopwatch.
- (vi) Supply of hot water. See notes 4 and 5.
- (vii) Paper towels to clean up any water spillages.

### 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 well below the 100 cm<sup>3</sup> level of the beaker.

Candidates must be able easily and safely to read temperatures up to 100 °C and to move the thermometer in and out of the beaker.

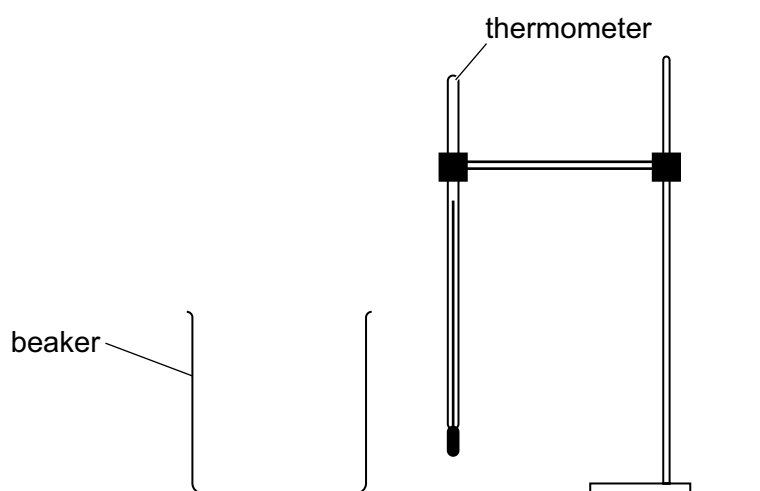
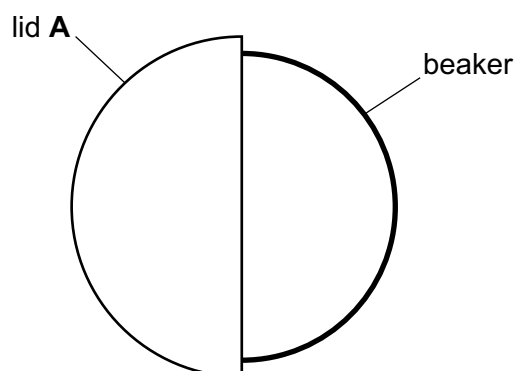


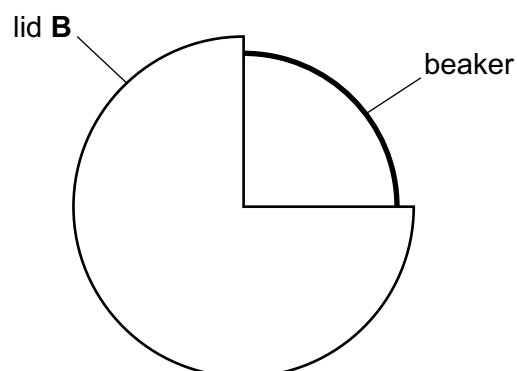
Fig. 1.1

- 2 Thin cardboard is a suitable material for the lids.

Lid **A** and lid **B** must be cut to shape as shown in Fig. 1.2 and Fig. 1.3. They must each be stable when partly covering the beaker as shown.



**Fig. 1.2**



**Fig. 1.3**

- 3 If the beaker does not have volume markings, the  $100\text{ cm}^3$  level must be marked on the side of the beaker.
- 4 Hot water is to be available for each candidate throughout the experiment. The hot water should be maintained at an approximately constant temperature of at least  $80\text{ }^\circ\text{C}$ . Each candidate will require about  $250\text{ cm}^3$  of hot water in total.
- They must be able to pour hot water into the beakers safely. Candidates will need to dispose of hot water during the experiment.
- 5 Candidates should be warned of the dangers of burns and scalds when using very hot water.

### Action at changeover

Empty the water from the beaker.

Check that the apparatus is intact and is arranged as in Fig. 1.1.

Spare lids, labelled **A** and **B**, must be available.

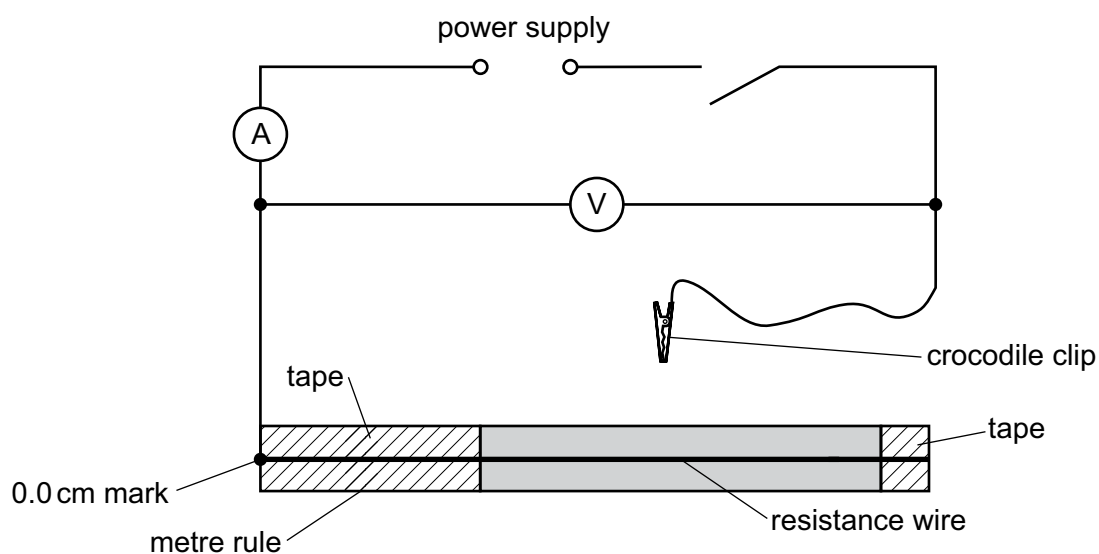
**Question 2****Items to be supplied by the centre (per set of apparatus unless otherwise specified)**

- (i) A resistance wire approximately 1 m in length, labelled **resistance wire**. 32 swg (0.274 mm diameter) constantan (Eureka) or any other wire with a resistance of approximately  $8\ \Omega/\text{m}$  is suitable. See note 1.
- (ii) Metre rule, graduated in mm. See note 1.
- (iii) Crocodile clip.
- (iv) Power supply of approximately 2 V to 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.
- (v) Switch. The switch may be a part of the power supply.
- (vi) Sufficient connecting leads to set up the circuit shown in Fig. 2.1.
- (vii) Ammeter capable of measuring currents up to 2.00 A with a minimum resolution of 0.05 A. See note 4.
- (viii) Voltmeter capable of measuring up to 3.0 V with a minimum resolution of 0.1 V. See note 4.
- (ix) Spare leads and crocodile clips.

**Notes**

- 1 The wire is to be fixed to the metre rule in such a way as to allow candidates to connect a crocodile clip to points between the 35 cm and 95 cm marks. Alternatively, a potentiometer fitted with an appropriate wire is suitable. Transparent tape must be used to tape over the wire between the 0.0 cm and 35.0 cm marks and between the 95.0 cm and 100.0 cm marks to prevent connection to these two sections.

- 2 The circuit is to be set up for candidates as shown in Fig. 2.1, with the crocodile clip not connected to the wire.



**Fig. 2.1**

- 3 If cells are used, they must remain sufficiently 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

Ensure that the circuit is connected as shown in Fig. 2.1.  
 Check that the circuit is working.  
 Disconnect the crocodile clip from the resistance wire.  
 Switch the circuit off.

### 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 rigid card with a triangular hole of height 1.5 cm to 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) 50 cm or 30 cm ruler, graduated in mm. Candidates may use their own.

#### Notes

- 1 The lamp used for the illuminated object should be low voltage, with a suitable power supply, e.g. a filament lamp of between 24 W and 36 W, or a lamp of equivalent brightness.
- 2 The lamp, 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 set up away from direct sunlight and provided for the candidate as shown in Fig. 3.3.

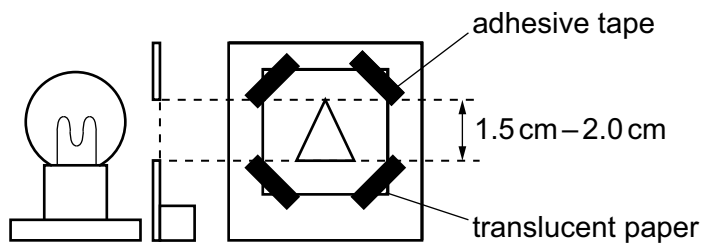


Fig. 3.1

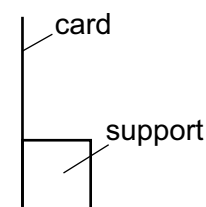


Fig. 3.2

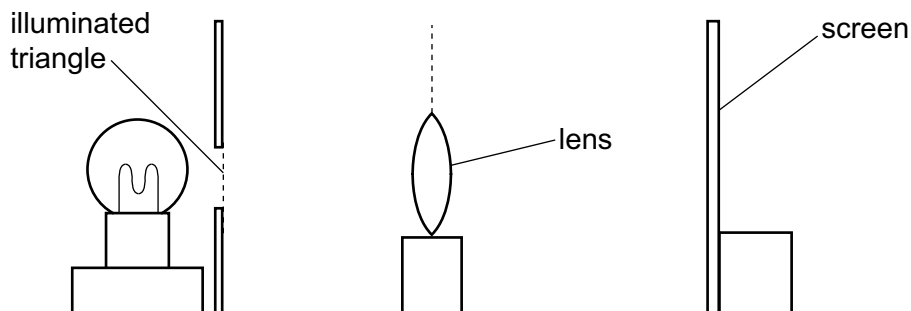


Fig. 3.3

**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.  
Arrange the apparatus as in Fig. 3.3.

**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 that practical session.
  
- 3 I have included details of difficulties relating to this 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) .....