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**PHYSICS**

**0625/52**

Paper 5 Practical Test

**February/March 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.**

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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 **8** printed 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) Sheet of plain A4 paper (*per candidate*) with a hole in one corner so that it can be tied into the Question Paper.
- (ii) Plane mirror, mounted so that it is perpendicular to the bench.
- (iii) Screen, capable of standing upright. See note 1.
- (iv) Lamp, low voltage, 24 W or greater, with a suitable power supply. See note 2.
- (v) Protractor. Candidates may use their own.
- (vi) 30 cm ruler, graduated in mm. Candidates may use their own.
- (vii) String or treasury tag (*per candidate*) to tie the ray-trace sheet, (as in (i)), into the Question Paper.

### Notes

1. A sheet of stiff card or thin wood approximately 70 mm × 70 mm, fixed to a wooden support, is suitable. The screen must have a slit, a minimum of 35 mm long and 1 mm to 2 mm wide.

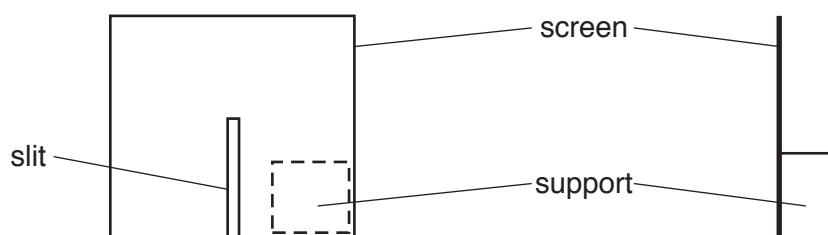


Fig. 1.1

2. The lamp, set behind the screen must be capable of projecting a ray of light at least 20 cm long, across the surface of the paper, before and after reflection by the upright plane mirror.
3. The apparatus should be situated so that the candidates can easily see the ray.
4. Spare sheets of paper, (as in (i)), must be available.

### Action at changeover

Supply a sheet of plain A4 paper, (as in (i)), and string or treasury tag, (as in (vii)).  
Check that the lamp is working.

## Question 2

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) Two  $250\text{cm}^3$  beakers, labelled **A** and **B**. See notes 1 and 2.
- (iv) Insulation material to cover the sides of beaker **A** as shown in Fig. 2.1.
- (v) Lid for beaker **B** as shown in Fig. 2.1, with a hole for the thermometer. Rigid card or thin wood are suitable.
- (vi) Measuring cylinder:  $100\text{cm}^3$  or  $250\text{cm}^3$ .
- (vii) Supply of hot water. See notes 3 and 4.
- (viii) Stopclock or stopwatch 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 stopclock.
- (ix) 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 well below the  $100\text{cm}^3$  level of the beakers. Candidates must be able easily and safely to read temperatures up to  $90^{\circ}\text{C}$  and to move the thermometer in and out of the beakers.

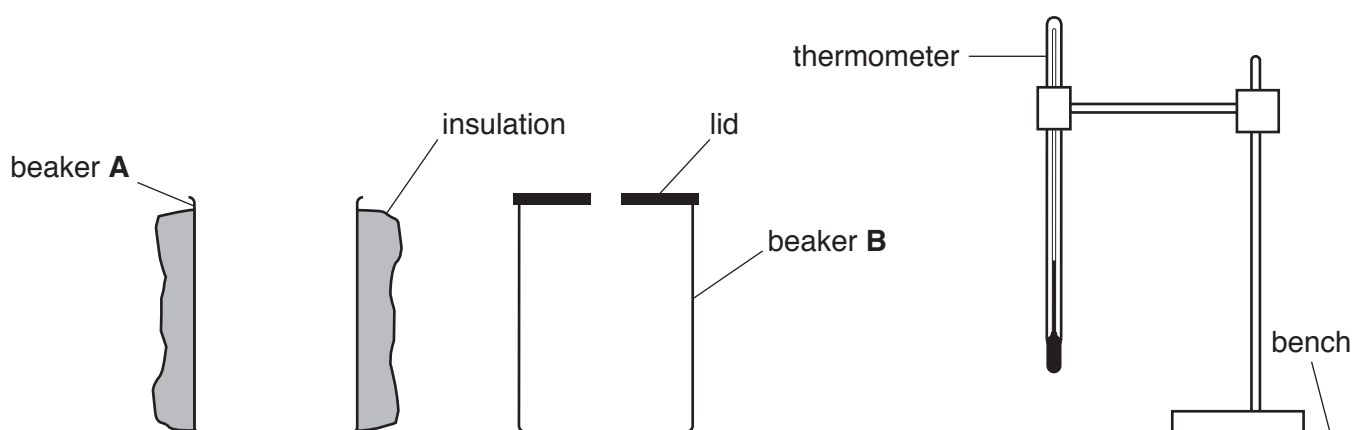


Fig. 2.1

2. The beakers are to be provided to candidates with the insulation and lid fitted as shown in Fig. 2.1.
3. Hot water is to be available for each candidate throughout the experiment. The hot water should be maintained at an approximately constant temperature between  $80^{\circ}\text{C}$  and  $90^{\circ}\text{C}$ . Each candidate will require about  $300\text{cm}^3$  of hot water in total. They must be able to pour hot water into the measuring cylinder and beakers safely.

4. Candidates must be warned of the dangers of burns or scalds when using hot water.

### Action at Changeover

Empty the water from the beakers and measuring cylinder. Check that the apparatus is intact and is arranged as in Fig. 2.1.

Ensure that the insulation is dry and replace if necessary.

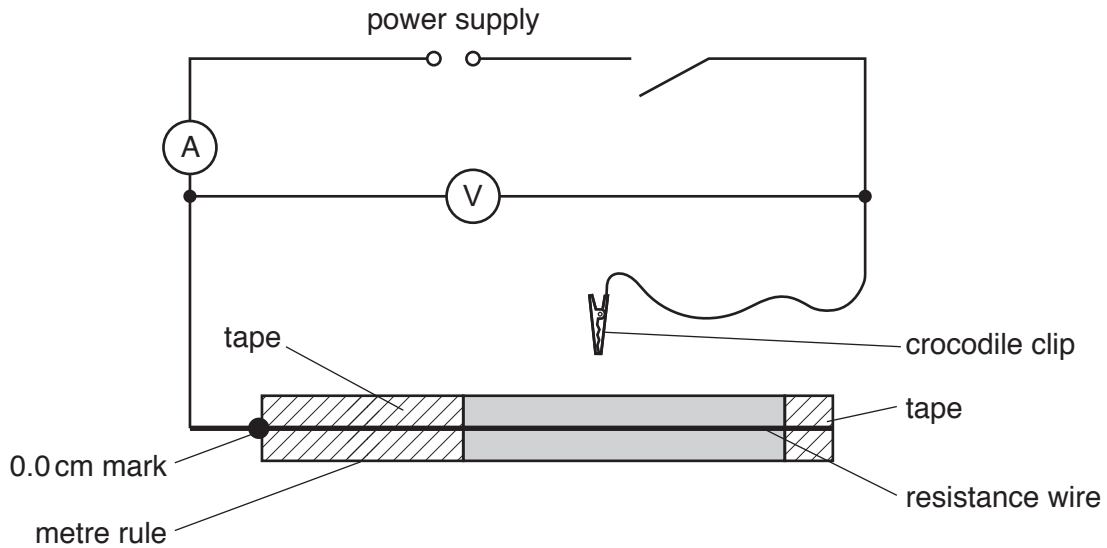
### Question 3

#### 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 to 3V. 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 an integral part of the power supply.
- (vi) Sufficient connecting leads to set up the circuit shown in Fig. 3.1.
- (vii) Ammeter capable of measuring currents up to 1.00A with a minimum resolution of 0.05A. See note 4.
- (viii) Voltmeter capable of measuring up to 3.0V with a minimum resolution of 0.1V. 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 to prevent connection to this section.
2. The circuit is to be set up for candidates as shown in Fig. 3.1, with the crocodile clip not connected to the wire.



**Fig. 3.1**

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. Spare meters must be available.

#### **Action at changeover**

Ensure that the circuit is connected as shown in Fig. 3.1. Check that the circuit is working. Disconnect the crocodile clip from the resistance wire and ensure that the circuit is switched 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 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) .....