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**PHYSICS**

**0972/51**

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.**

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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) Metre rule, with a mm scale. See note 1.
- (ii) Triangular block to act as a pivot for the metre rule. This block is to stand on the bench.
- (iii) A 100g mass, labelled P. See notes 2 and 3.
- (iv) Access to one balance (electronic or otherwise) capable of measuring to the nearest gram and capable of measuring masses up to 200g.

#### Notes

1. If the metre rule has two scales in opposite directions, one scale must be taped over.
2. Any suitable mass that can rest on the metre rule can be used.
3. The value of the mass or weight of P must **not** be visible to the candidates.

#### Action at changeover

Remove the mass P from the metre rule.

Remove the metre rule from the pivot.

Check that the apparatus is ready for the next candidate.

## Question 2

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

- (i) Power supply of approximately 1.5V – 3V. Where candidates are provided with a power supply with a variable output voltage, the voltage must be set by the Supervisor and fixed (e.g. taped). See note 2.
- (ii) Switch. The switch may be an integral part of the power supply.
- (iii) Ammeter capable of reading up to 1.00A with a resolution of at least 0.05A. See note 3.
- (iv) Voltmeter capable of measuring the supply p.d. with a resolution of at least 0.1V. See note 3.
- (v) Approximately 105 cm of straight, bare constantan (Eureka) wire, diameter 0.45 mm (26 swg) or 0.38 mm (28 swg) or 0.32 mm (30 swg), taped to a metre rule only between the 3 cm and 7 cm marks and between the 93 cm and 97 cm marks. The end of the wire at the zero end of the metre rule is to be labelled B. See note 4.
- (vi) Two suitable 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. 2.1.
- (vii) Sliding contact, labelled 'C'. This may be a jockey or a small screwdriver connected to a lead by means of a crocodile clip.
- (viii) Sufficient connecting leads to set up the circuit shown in Fig. 2.1.
- (ix) Metre rule, with a mm scale. See note 5.

### Notes

1. The circuit is to be set up for the candidates as shown in Fig. 2.1 and Fig. 2.2.

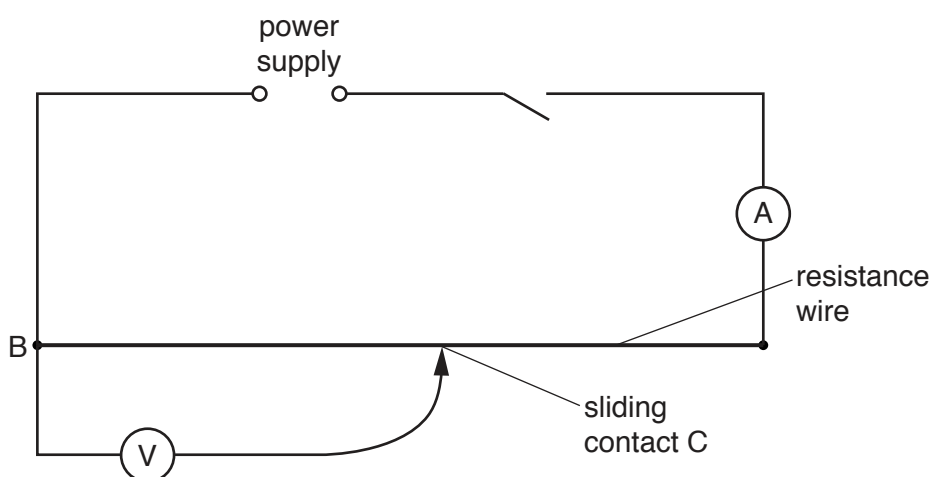


Fig. 2.1

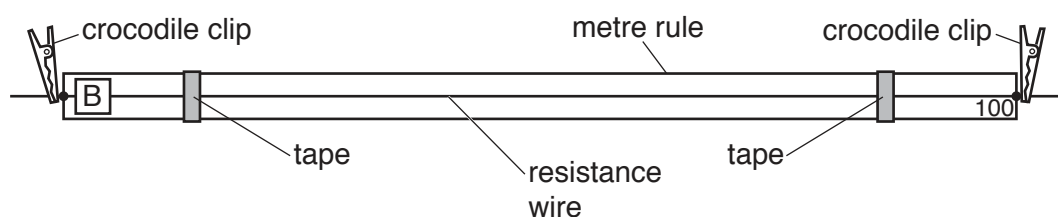


Fig. 2.2

2. If cells are to be used, they must remain adequately charged throughout 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). Spare meters should be available.
4. The wire must be attached to the metre rule as shown in Fig. 2.2.
5. If the metre rule has two scales in opposite directions, one scale must be taped over.

### Action at changeover

Check that the circuit is arranged as shown in Fig. 2.1.

Check that the circuit works. Switch off.

### Question 3

#### 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.
- (ii)  $250\text{ cm}^3$  beaker labelled A.
- (iii) Metal can labelled B. See note 1.
- (iv) Two lids cut from stiff card. Each lid must have a hole in the centre just large enough to accept the thermometer. See note 2.
- (v)  $100\text{ cm}^3$  or  $250\text{ cm}^3$  measuring cylinder.
- (vi) Stopclock or stopwatch or wall-mounted clock showing seconds. Candidates will be required to take readings at 30-second intervals. Candidates may use their own wristwatches. The question will refer to a stopclock.
- (vii) Supply of hot water. See notes 3 and 5.
- (viii) Clamp, boss and stand. See note 4.
- (ix) Supply of paper towels to mop up any spills of water.

### Notes

1. The can must be similar in size to the beaker and capable of holding  $250\text{ cm}^3$  of hot water. The outside of the can must be painted matt black.
2. The card must be sufficiently thick to act as a rigid lid. Each lid must be sufficiently large to cover the top of the beaker or the top of the can completely.
3. The hot water is to be supplied for each candidate by the Supervisor. The water should be maintained at a temperature as hot as is reasonably and safely possible. Each candidate will require about  $600\text{ cm}^3$  of hot water.
4. The clamp, boss and stand must be set up for the candidates with the thermometer held in the clamp. The thermometer bulb must be well below the  $200\text{ cm}^3$  level of the beaker and the can.

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

**Action at changeover**

Empty the beaker, can and measuring cylinder.

Check the lids and replace if damaged or wet.

Check the supply of hot water.

**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) .....