



Cambridge IGCSE™ (9–1)

PHYSICS

0972/51

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 **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.

The following hazard codes are used in these confidential instructions, where relevant:

C	corrosive	MH	moderate hazard
HH	health hazard	T	acutely toxic
F	flammable	O	oxidising
N	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

Question 1

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

- (i) Clamp, boss and stand.
- (ii) Pendulum bob attached to approximately 110 cm of thin inextensible thread.
- (iii) Metre rule, graduated in mm.
- (iv) Stop-clock or stop-watch with a minimum precision of 0.1 s.
- (v) Split cork or similar device to hold the thread of the pendulum between the jaws of the clamp.

Notes

1. The pendulum, adjusted to a length of approximately 40 cm, should be set up for the candidates.
2. Candidates must be able easily to adjust the length of the pendulum up to a length of 100 cm.
3. It may be necessary to increase the stability of the clamp stand (for example, using a G-clamp or by placing a weight on the base).

Action at changeover

Arrange the pendulum as described in note 1.

Question 2

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

- (i) Power supply of approximately 1.5–3V. 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) Filament lamp in a suitable holder, labelled **L**. Any low voltage lamp will suffice, provided that it glows when connected as shown in Fig. 2.1, with the sliding contact **S** at point **C** on the resistance wire.
- (iii) Switch. The switch may be an integral part of the power supply.
- (iv) Ammeter capable of reading up to 1.00A with a minimum precision of 0.02A. See note 3.
- (v) Voltmeter capable of measuring the supply p.d. with a minimum precision of 0.1V. See note 3.
- (vi) Approximately 105 cm of straight, bare constantan (Eureka) wire, diameter 0.28 mm (32 swg) or any other wire with a resistance of approximately $8\ \Omega/\text{m}$. The wire must be 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 rule is to be labelled **C**. The other end is to be labelled **E**. The wire is to be labelled **D** at the 50 cm mark. See Fig. 2.2.
- (vii) Suitable terminal (e.g. crocodile clip) attached to the constantan wire at the end **C** of the metre rule so that connection can be made to the circuit, as shown in Fig. 2.1.
- (viii) Sliding contact, labelled **S**. This may be a jockey or a small screwdriver connected to a lead by means of a crocodile clip.
- (ix) Sufficient connecting leads to construct the circuit shown in Fig. 2.1.
- (x) Spare lamps and spare leads.

Notes

1. The components are to be connected by the supervisor as shown in Fig. 2.1.

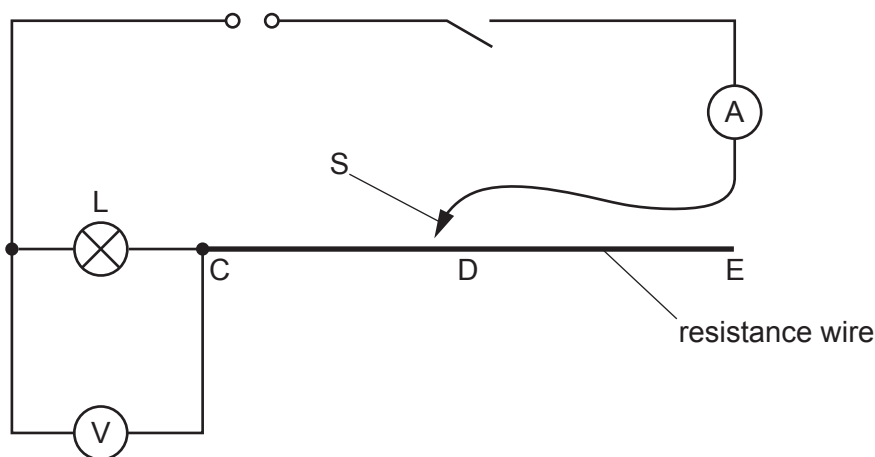


Fig. 2.1

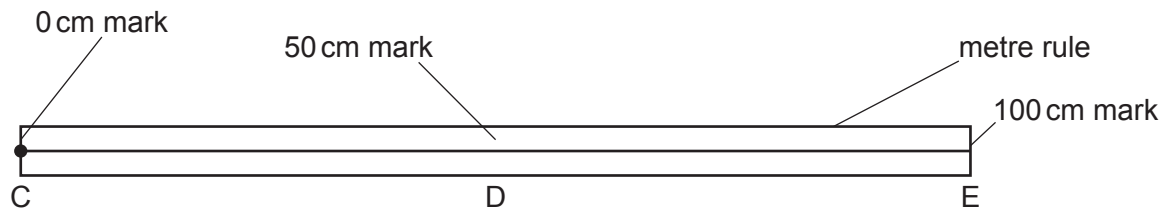


Fig. 2.2

2. If cells are used, they must remain adequately charged throughout the examination. Spare cells must 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 must be available.

Action at changeover

Set up the circuit so that it is arranged as shown in Fig. 2.1.

Check the power supply and lamps.

Question 3

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.
- (ii) A stand, boss and clamp. See note 1.
- (iii) A 250 cm^3 beaker.
- (iv) A stirring rod.
- (v) 250 cm^3 measuring cylinder, graduated in 1 cm^3 or 2 cm^3 intervals.
- (vi) Stop-clock, stop-watch or wall-mounted clock showing seconds. The question will refer to a stop-watch.
- (vii) Supply of hot water. See notes 2 and 3.
- (viii) Supply of water at room temperature, labelled **cold water**. See note 4.
- (ix) Supply of paper towels to mop up any spills of water.

Notes

1. Use the stand, boss and clamp to hold the thermometer vertically so that the bulb is approximately 1 cm above the surface of the bench. The arrangement should be set up for the candidates.
2. 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 approximately 400 cm^3 of hot water.
3. Candidates should be warned of the dangers of burns or scalds when using very hot water.
4. Each candidate will require approximately 150 cm^3 of cold water.

Action at changeover

Empty the beaker and measuring cylinder.

Dry the thermometer.

Check the supply of hot water.

Check the supply of water at room temperature.

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)