



# Cambridge IGCSE™ (9–1)

**PHYSICS**

**0972/51**

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.**

## 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

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:

|           |                                      |           |                 |
|-----------|--------------------------------------|-----------|-----------------|
| <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.

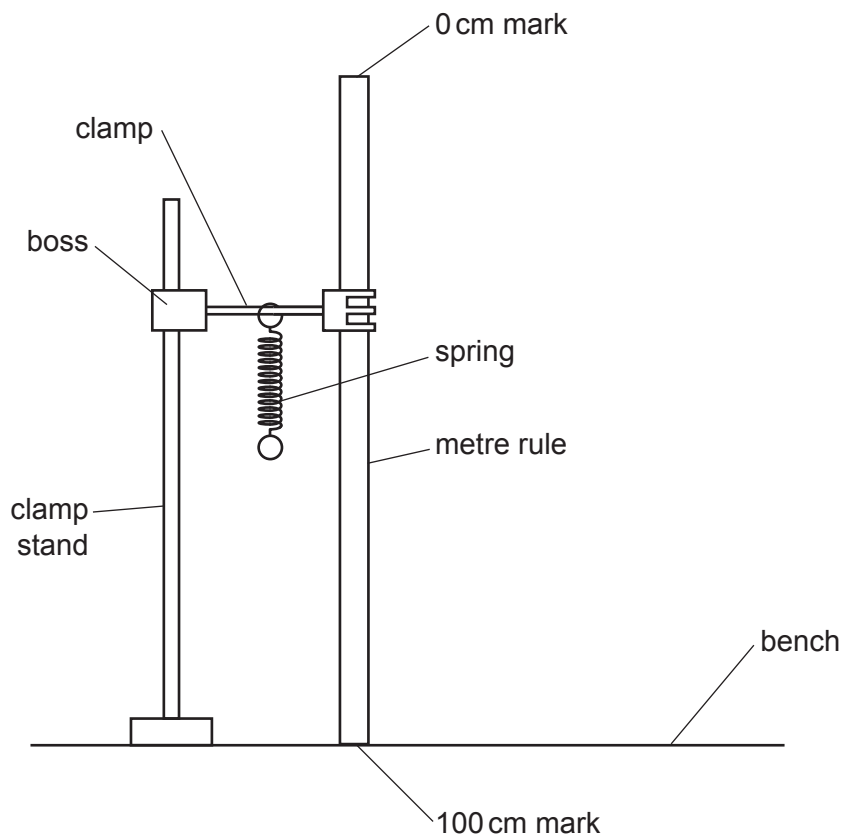
## Specific information for this practical exam

### Question 1

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

- (i) Clamp, boss and stand.
- (ii) Expendable spring, approximately 55 mm overall length (including loops)  $\times$  15 mm diameter, capable of supporting at least 500 g without overstretching (e.g. Philip Harris expendable steel spring, [www.philipharris.co.uk](http://www.philipharris.co.uk)).
- (iii) A 10 g mass hanger and nine 10 g slotted masses. See note 1.
- (iv) Metre rule graduated in mm. See note 3.
- (v) Set square.
- (vi) Spare springs should be available.

#### Notes



**Fig. 1.1**

1. The nine 10 g slotted masses and the 10 g mass hanger should each be labelled 0.10 N. An alternative to individually labelling the masses is to provide a card with the words 'each mass and the mass hanger has a weight of 0.10 N'. If slotted masses are not available, a light hook must be provided so that up to ten 10 g masses, each labelled 0.10 N, can be suspended from the spring.

2. The apparatus is to be set up for the candidates as shown in Fig. 1.1. The spring is to be suspended from the clamp, supported by a boss and stand. The spring must be sufficiently high above the laboratory bench so that when the 1.00 N load is suspended from the spring, the bottom of the load is above the surface of the bench.
3. The metre rule (supported by the clamp, boss and stand) must be near to, but not touching, the spring. The 100 cm end of the metre rule must be touching the bench.

**Action at changeover**

Check that the apparatus is set up ready for the next candidate, as shown in Fig. 1.1, with the spring near to the metre rule.

Replace the spring if it has been overstretched.

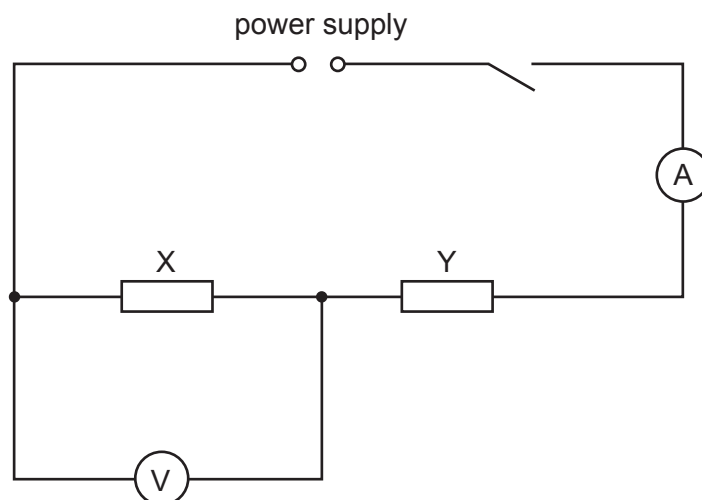
## Question 2

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

- (i) Power supply of approximately 1.5–3 V. Where candidates are provided with a power supply with a variable output voltage, the voltage setting should be set by the supervisor and fixed (e.g. taped). See note 2.
- (ii) Three resistors of nominal value  $4.7\ \Omega$  with a power rating of at least 2 W. See note 3.
- (iii) Switch. The switch may be an integral part of the power supply.
- (iv) Ammeter capable of reading up to 1.00 A with a minimum precision of 0.05 A. See note 4.
- (v) Voltmeter capable of measuring the supply p.d. with a minimum precision of 0.1 V. See note 4.
- (vi) Sufficient connecting leads to construct the circuit shown in Fig. 2.1, with two additional leads. See note 3.

### Notes

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



**Fig. 2.1**

2. If cells are to be used they must remain adequately charged throughout the examination. Spare cells should be available.
3. The resistors must be labelled **X**, **Y** and **Z**. The values of resistance must not be visible to the candidates. The resistors must have suitable terminals so that candidates are able easily and quickly to rearrange the circuit.
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

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

Check the power supply.

### Question 3

#### 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 Booklet.
- (ii) Plane mirror with a holder. See note 1.
- (iii) 4 optics pins.
- (iv) Pin board e.g. a cork mat, A4 size or larger.
- (v) Protractor (candidates may use their own).
- (vi) 50 cm or 30 cm ruler, graduated in mm (candidates may use their own).
- (vii) String or treasury tag (per candidate) to tie the ray-trace sheet into the question booklet.

#### Notes

1. The mirror should be capable of standing vertically with one edge on the sheet of plain A4 paper.
2. Spare sheets of plain paper should be available (as in (i)).
3. Spare pins should be available.

#### Action at changeover

Supply a sheet of plain A4 paper (as in (i)) and string or a treasury tag (as in (vii)).

### 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) .....