



Cambridge IGCSE™

PHYSICS

0625/52

Paper 5 Practical Test

February/March 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 **12** pages. Any blank pages are indicated.

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

The supervisor must perform the experiment for question 1 out of sight of the candidates and submit their results as part of the supervisor's report.

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

- (i) Steel spring. See note 1.
- (ii) 2 clamps, 2 bosses and 2 stands. See notes 2 and 3.
- (iii) Nail or rod to act as a pivot. See note 3.
- (iv) Mass of 100g labelled '**1.0 N load**'. See note 4.
- (v) Mass of 250g labelled '**load W**'. See note 5.
- (vi) Metre rule, graduated in mm. See note 6.
- (vii) Wire to form a small hook. See note 6.
- (viii) 50 cm or 30 cm ruler, graduated in mm. Candidates may use their own ruler.
- (ix) Set square. Candidates may use their own.

Notes

1. An expendable steel spring is suitable, for example a spring with a diameter of approximately 16 mm and a length of approximately 20 mm across the unextended coils (e.g. Philip Harris expendable steel spring B8A41397, www.philipharris.co.uk). The spring must be able to support a load of at least 5 N without overstretching. Each spring should extend to at least 55 mm in length for a load of 1.0 N.
Spare springs must be available.
2. One clamp, boss and stand must be provided to candidates with the spring suspended from the clamp, as shown in Fig. 1.1. The stand must be sufficiently tall to support the spring with a 2.0 N load without the load touching the bench.

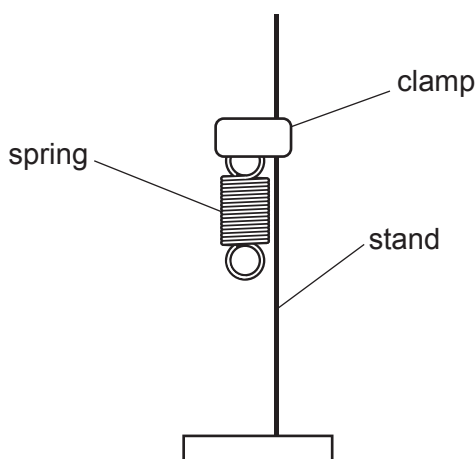


Fig. 1.1

3. A second clamp, boss and stand must be provided to candidates, as shown in Fig. 1.2. The nail or rod should be held by the clamp and must protrude to allow the metre rule to rest on the rod. Alternatively, the rod of the clamp may be used as the support for the metre rule.

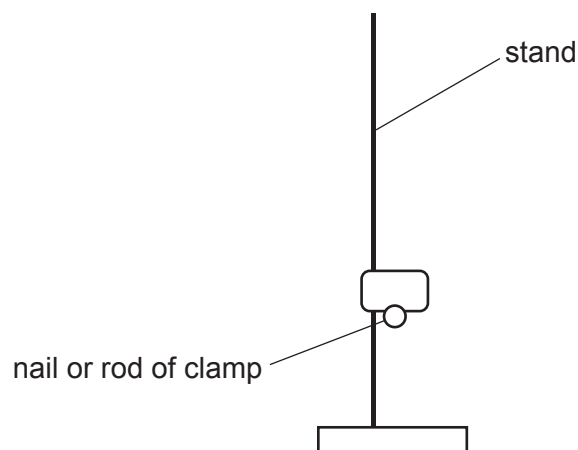


Fig. 1.2

4. The 100g mass must include a hanger so that it can be suspended from the spring.
5. The load W must be able to rest on the metre rule, supported and horizontal, without toppling. The load can be slightly wider than the metre rule.
6. If the metre rule has two scales in opposite directions, one scale must be taped over. A wire hook must be fixed at the 95.0 cm mark, as shown in Fig. 1.3. The hook should be taped to the rule so that its position does not change during the experiment. Candidates will be required to attach the hook to the lower loop of the spring. Candidates must be able easily to attach and separate the hook and spring.

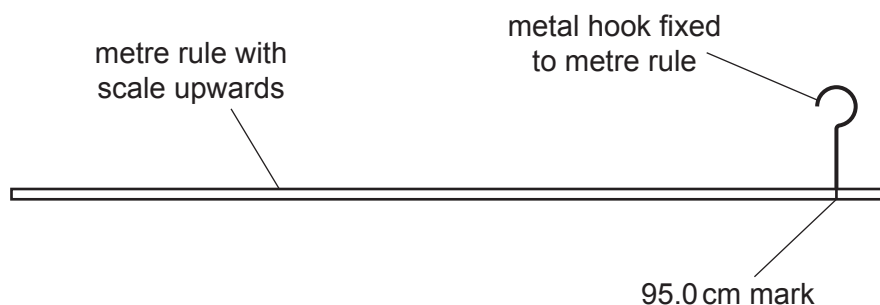


Fig. 1.3

7. The apparatus must be presented to candidates as shown in Fig. 1.1, Fig. 1.2 and Fig. 1.3, with all other apparatus provided unassembled.

Action at changeover

Arrange the apparatus as outlined in note 7.

Check that the spring has not been deformed by overstretching and replace if necessary.

Question 2

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. See note 1.
- (ii) Clamp, boss and stand. See note 1.
- (iii) 250 cm^3 beaker labelled '**beaker A**'. See notes 2 and 4.
- (iv) Lid for beaker A. See note 3.
- (v) 400 cm^3 beaker labelled '**beaker B**'. See note 4.
- (vi) Supply of hot water. See notes 5 and 6.
- (vii) Stop-clock or stop-watch or wall-mounted clock showing seconds. The question will refer to a stop-clock.
- (viii) 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 below the 100 cm^3 level of beaker A. 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 without removing it from the clamp. Candidates are to be provided with the two beakers as shown in Fig. 2.1.

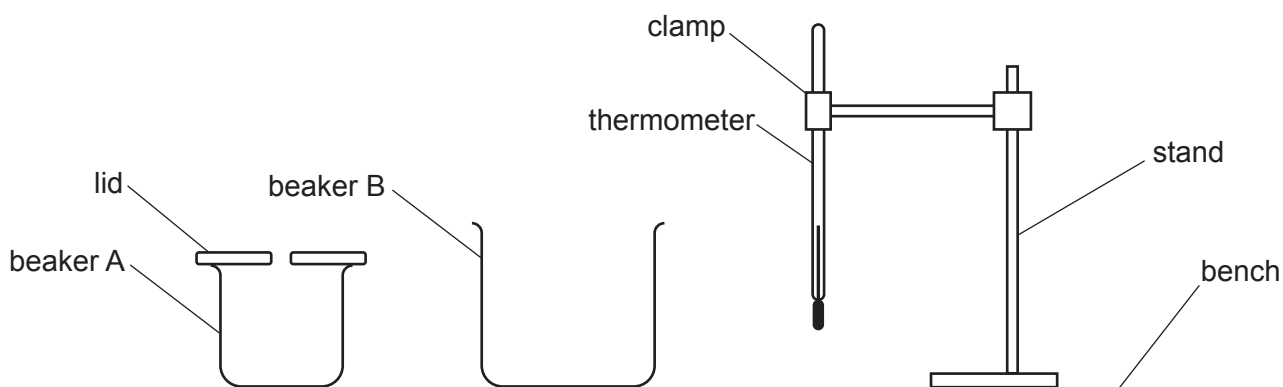


Fig. 2.1

2. The sides and base of beaker A must be **tightly** covered with thin matt black paper or card. Beaker A must have a clear mark at the 150 cm^3 level which can be read from inside the beaker.
3. The lid may be made from any insulating material. Thick card is suitable. There must be a small hole to allow the thermometer to be inserted. The lid must fit inside beaker B without leaving a gap.

4. Beaker A must be able to fit inside beaker B, leaving a gap between the sides, as shown in Fig. 2.2.

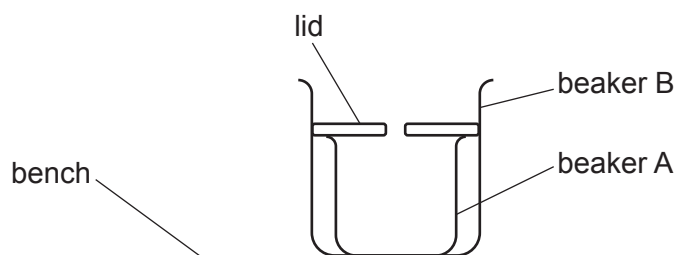


Fig. 2.2

5. 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 °C and 100 °C. Each candidate will require approximately 350 cm³ of hot water in total. Candidates must be able to pour hot water into and out of beaker A safely.
6. Candidates must be warned of the dangers of burns or scalds when using very hot water.
7. Spare lids, black card covers for beaker A and thermometers must be available.

Action at changeover

Remove beaker A from beaker B if necessary and empty the water from the beaker.

Check that the apparatus is intact and is arranged as in Fig. 2.1.

Replace the lid if necessary.

Replace the black card cover if it has become wet.

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 paper booklet.
- (ii) Rectangular, transparent glass or Perspex block, 10 cm × 6 cm × 1.5 cm or similar size.
- (iii) Plane mirror, length approximately 6 cm, capable of standing perpendicular to the bench and with its face against the block.
- (iv) 4 optics pins.
- (v) Pin board (e.g. cork mat), A4 size or larger.
- (vi) 50 cm or 30 cm ruler, graduated in mm. Candidates may use their own.
- (vii) Protractor. Candidates may use their own.
- (viii) String or treasury tag (per candidate) to tie the ray-trace sheet, (i) above, into the question paper booklet.

Notes

1. Spare sheets of plain paper, as in (i) above, and pins should be available.

Action at changeover

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

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)