



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS

0625/52

Paper 5 Practical Test

October/November 2014

CONFIDENTIAL INSTRUCTIONS

Great care should be taken to ensure that any confidential information given does not reach the candidates either directly or indirectly.



If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: info@cie.org.uk,
by phone: +44 1223 553554,
by fax: +44 1223 553558,
stating the Centre number, the nature of the query and the syllabus number quoted above.

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The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **10** printed pages and **2** blank pages.

Instructions for preparing apparatus

The Supervisor is **not** allowed to consult the Question Paper before the examination. This teacher should, as part of the preparation of the examination requirements, test the apparatus in order to ensure that it is satisfactory.

The Supervisor is asked to give (and attach to the Report form printed on pages 11 and 12) a *brief* description of the apparatus supplied, mentioning any points that are likely to be of importance to the Examiner in marking the answers. The Supervisor should also report any assistance given to candidates. All reports should be signed by the Supervisor and by the person responsible for preparing the apparatus.

In addition to the usual equipment of a physics laboratory, each candidate will require the apparatus specified in these Instructions. If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Report.

Number of sets of apparatus

As a *minimum*, the number of sets of apparatus provided should be $N/4$, where N is the number of candidates (per session). A few spare sets should, preferably, be available to avoid any candidate being delayed when moving to another question.

Centres may find it more convenient and easier to administer if $N/3$ sets (plus one or two 'spares') of apparatus are provided.

The order in which a given candidate attempts the four questions is immaterial.

Assistance to Candidates

The purpose of the Practical Physics test is to find out whether the candidates can carry out simple practical work themselves. The Examiners are aware that candidates may sometimes be unable to show their practical ability through failure to understand some point in the theory of the experiment. If an Examiner were present in the laboratory, he/she would be willing to give a hint to enable such a candidate to get on with an experiment. In order to overcome this difficulty, the Supervisor is asked to co-operate with the Examiners to the extent of being ready to give (or allow the Physics teacher to give) a hint to a candidate who is unable to proceed.

The following regulations must be strictly adhered to.

- (i) No hint may be announced to the candidates as a whole.
- (ii) A candidate who is unable to proceed and requires assistance must come up to the Supervisor and state the difficulty. Candidates should be told that the Examiners will be informed of any assistance given in this way.
- (iii) A report must be made of any assistance given to the candidate, with the name and candidate number of the candidate.

It is suggested that the following announcement be made to the candidates.

'The Examiners do not want you to waste time through inability to get on with an experiment. Any candidate, therefore, who is unable to get on with the experiment after spending five minutes at it may come to me and ask for help. I shall report to the Examiners any help given in this way, and some marks may be lost for the help given. You may ask me for additional apparatus which you think would improve the accuracy of your experiments, and you should say, on your script, how you use any such apparatus supplied.'

Question 1**Items to be supplied by the Centre (per set of apparatus unless otherwise specified)**

- (i) A lump of modelling clay (e.g. Plasticine) of mass approximately 100g, one per candidate. The modelling clay must be supplied to the candidate cube shaped. See note 1.
- (ii) 30 cm or 50 cm rule with a mm scale.
- (iii) 200 cm³ or 250 cm³ measuring cylinder.
- (iv) Approximately 30 cm of thread, one per candidate. Candidates will be required to lower the piece of modelling clay into the measuring cylinder.
- (v) Balance capable of measuring mass to a precision of at least 1 g. One balance per set of apparatus is not essential but candidates must have easy access to a balance without delay.
- (vi) 250 cm³ beaker containing approximately 200 cm³ of water at room temperature.
- (vii) Two small, rectangular blocks of wood with sides greater than the length of one side of the cube of modelling clay.
- (viii) Supply of paper towels to mop up any spillages of water.

Notes

1. The modelling clay should be preworked so that it is easy for the candidate to mould.

Action at changeover

Replace the modelling clay and thread.

Empty the measuring cylinder.

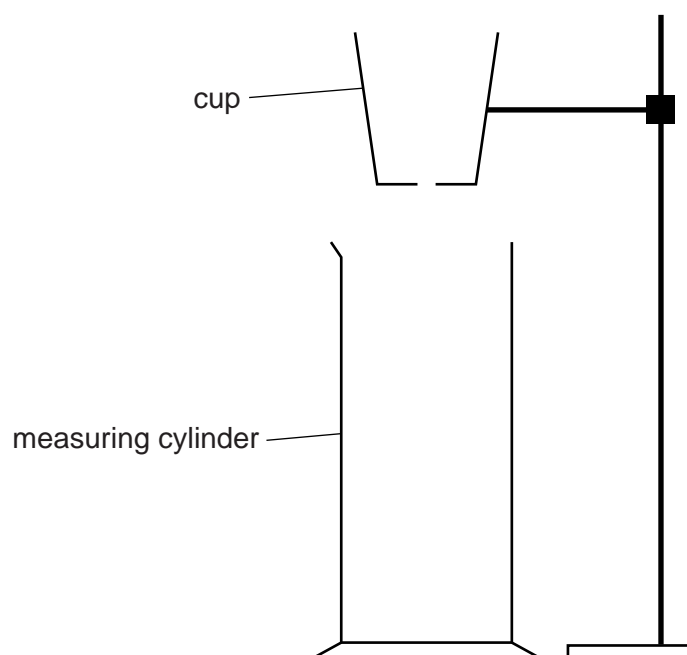
Check that the beaker contains approximately 200 cm³ of water.

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.
- (ii) Empty 250 cm^3 beaker.
- (iii) 250 cm^3 measuring cylinder.
- (iv) Plastic drinks cup with volume approximately 150 cm^3 to 250 cm^3 . See notes 1 and 2.
- (v) Two clamps, two bosses and two stands.
- (vi) Stopclock, stopwatch or wall-mounted clock showing seconds. Candidates may use their own wristwatch. The question will refer to a stopclock.
- (vii) Supply of hot water. See notes 3 and 4.
- (viii) 250 cm^3 beaker containing approximately 250 cm^3 of water at room temperature.
- (ix) Stirrer. A teaspoon is suitable.
- (x) Supply of paper towels to mop up any spills of water.
- (xi) Supply of spare cups. See notes 1 and 2.

Notes

1. The cup is to have a small hole, between 2 mm and 3 mm diameter, in the base. The hole must allow water to flow out of the cup so that 100 cm^3 of water flows out in approximately 30 s to 60 s. The cup must be supported by a clamp (or similar device), over a measuring cylinder as shown in Fig. 2.1.

**Fig. 2.1**

2. The outside of the cup is to have the 150 cm^3 level clearly marked.
3. The hot water is to be supplied for each candidate by the Supervisor. The water temperature should be between $80\text{ }^\circ\text{C}$ and $100\text{ }^\circ\text{C}$. Each candidate will require about 250 cm^3 of hot water.
4. Candidates should be warned of the dangers of burns or scalds when using very hot water.
5. A clamp, boss and stand are to be set up with the thermometer held in the clamp as shown in Fig. 2.2. The candidates must be able easily and safely to read temperatures up to $90\text{ }^\circ\text{C}$ and to move the thermometer in and out of the water without the danger of the beaker tipping.

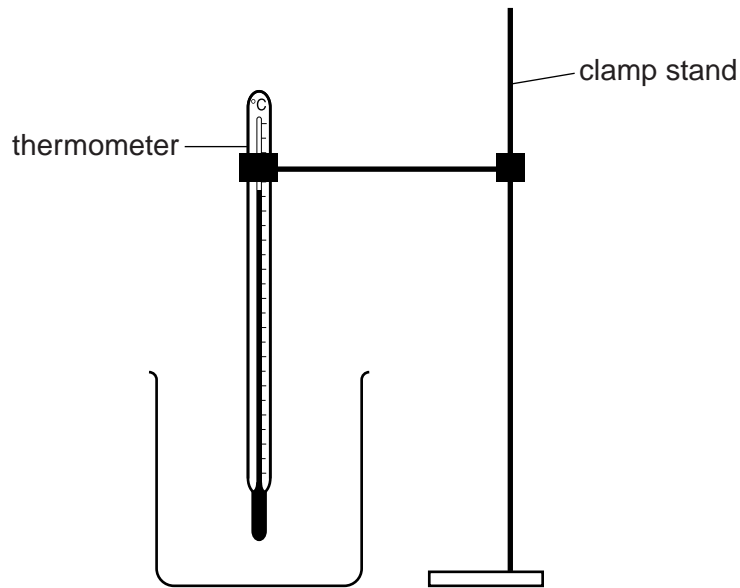


Fig. 2.2

Action at changeover

Empty the beakers and measuring cylinder.
Check the supply of hot water.
Replenish the supply of water at room temperature.
Check that the cup is not damaged. Replace if necessary.

Question 3

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

- (i) Power supply of approximately 1.5V – 2V. 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).
- (ii) Voltmeter capable of measuring the supply p.d. with a minimum resolution of 0.1 V. See note 4.
- (iii) Ammeter capable of measuring current with a minimum resolution of 0.05 A. See note 4.
- (iv) Switch. The switch may be an integral part of the power supply.
- (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 at three places (between the 5 cm and 10 cm marks, the 47 cm and 52 cm marks and the 85 cm and 90 cm marks). The zero end of the rule is to be labelled **P** and the other end is to be labelled **Q**. See note 2.
- (vi) Two suitable terminals (e.g. crocodile clips) attached to the constantan wire at ends **P** and **Q** of the metre rule so that connections can be made to the circuit shown in Fig. 3.1. See note 2.
- (vii) Sliding contact. 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. 3.1.

Notes

1. The circuit must be set up for the candidates as shown in Fig. 3.1.

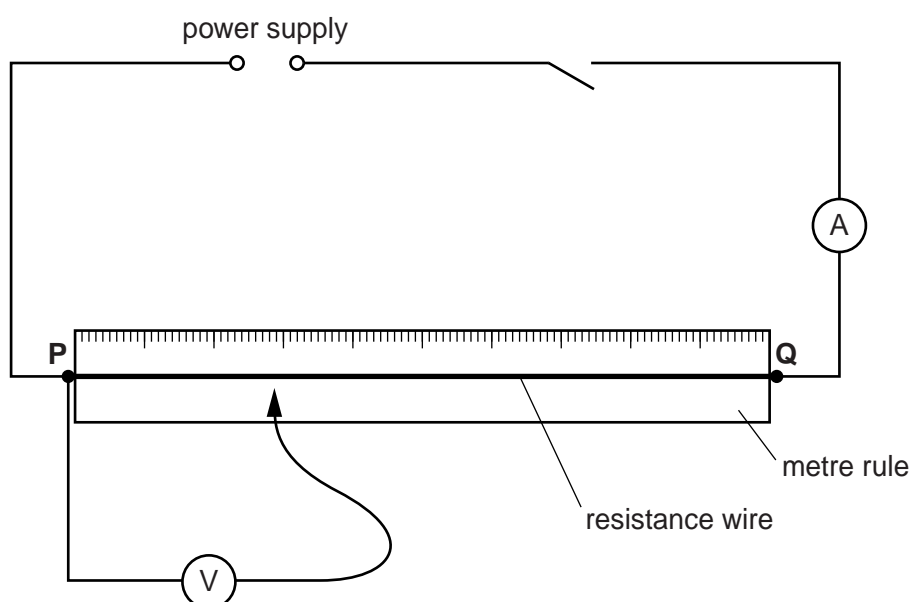


Fig. 3.1

2. As an alternative to (v) and (vi) a standard 100 cm potentiometer is acceptable, with ends labelled **P** and **Q**.

3. If cells are to be used as the power supply, they must remain adequately charged throughout the examination. Spare cells should be available.
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

Check that the circuit is as shown in Fig. 3.1.

Check that the circuit is working. Switch off the circuit.

Question 4**Items to be supplied by the Centre (per set of apparatus, unless otherwise specified)**

- (i) Sheet of plain A4 size paper with a hole in one corner so that it can be tied into the Question Paper (one per candidate).
- (ii) Rectangular, transparent glass or Perspex block 10 cm × 6 cm × 1.5 cm or similar size.
- (iii) 4 optics pins.
- (iv) Pin board (e.g. a cork mat) A4 size or larger.
- (v) Protractor.
- (vi) 50 cm or 30 cm rule, graduated in mm.
- (vii) String or treasury tag to tie the sheet of paper (see (i) above) into the Question Paper (one per candidate).

Notes

1. Some spare sheets of plain A4 size paper should be available.
2. Spare pins should be available.

Action at changeover

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

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE OCTOBER/NOVEMBER 2014)

General

The Supervisor is required to give details of any difficulties experienced by particular candidates giving their names and candidate numbers. These should include reference to:

- (a) difficulties due to faulty apparatus;
- (b) accidents to apparatus or materials;
- (c) any other information that is likely to assist the Examiner, especially if this cannot be discovered in the scripts;
- (d) any help given to a candidate.

Information required

A plan of workbenches, giving details by candidate number of the places occupied by the candidates for each experiment for each session, must be enclosed with the scripts.



Information required (cont.)

A list by name and candidate number of candidates requiring help, with details of the help provided.

CENTRE NO.

NAME OF CENTRE

Declaration (to be signed by the Supervisor and the person responsible for preparing the apparatus)

The preparation of the practical examination has been carried out so as to maintain fully the security of the examination.

SIGNED
Supervisor

SIGNED
Person responsible for preparing the apparatus

