



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS

0625/51

Paper 5 Practical Test

October/November 2015

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.

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 **8** printed 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 7 and 8) 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.

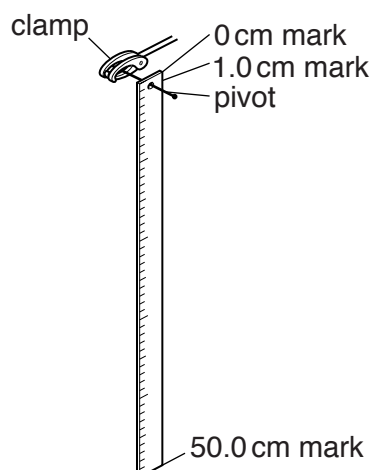
'The Examiners do not want you to waste time through inability to get on with an experiment. Any candidate, therefore, who is unable to get on with the experiment after spending five minutes at it may come to me and ask for help. I shall report to the Examiners any help given in this way, and some marks 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) 2 clamps, 2 bosses and 2 stands.
- (ii) Pendulum bob attached to approximately 60 cm of thin inextensible string.
- (iii) Metre rule.
- (iv) Stopwatch with a minimum precision of 0.1 s. Candidates may use their own wristwatch facility if they wish.
- (v) Split cork or similar device to hold the string of the pendulum between the jaws of the clamp.
- (vi) 50 cm rule or 50.0 cm long strip of wood or thick card of similar dimensions to a standard laboratory half-metre rule. See note 4.
- (vii) Thin nail or similar, to act as a pivot. See note 5.

Notes

1. The pendulum should be set up for the candidates with length approximately 45 cm from the bottom of the split cork to the bottom of the pendulum bob.
2. Candidates must be able easily to adjust the length of the pendulum.
3. It may be necessary to increase the stability of the clamp stands (for example, using a G-clamp or by placing a weight on the base).
4. The rule is to have a small hole at the 1.0 cm mark to accept the pivot.
5. The rule is to be set up as shown in Fig. 1.1. The sharp end of the nail must be held within the clamp and the blunt end of the nail must be facing the candidate. The rule must be able to swing freely on the pivot.

**Fig. 1.1****Action at changeover**

Check that the apparatus is set up as described in notes 1 and 5.

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) 250 cm^3 beaker, labelled **A**, containing 100 cm^3 of water at room temperature. See notes 3 and 4.
- (iii) 250 cm^3 beaker, labelled **B**.
- (iv) 100 cm^3 or 250 cm^3 measuring cylinder.
- (v) Clamp, boss and stand.
- (vi) Supply of hot water. See notes 1 and 2.
- (vii) Stirrer. A teaspoon is suitable.
- (viii) Supply of paper towels to mop up any spills of water.

Notes

1. 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 150 cm^3 of hot water.
2. Candidates should be warned of the dangers of burns or scalds when using very hot water.
3. The clamp, boss and stand are to be set up with the thermometer held in the clamp. The candidates must be able easily and safely to read temperatures up to 100°C and to move the thermometer in and out of the water without the danger of a beaker tipping.
4. The thermometer bulb must be in the water in beaker **A** at the start of the experiment.

Action at changeover

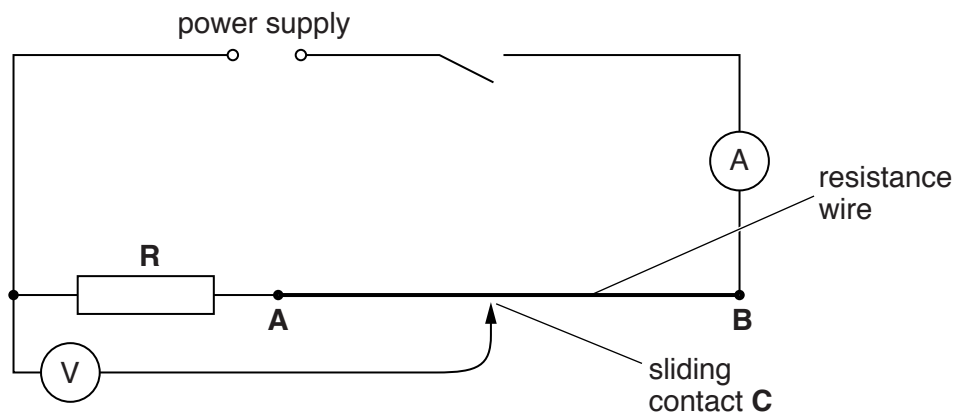
Empty the beakers and measuring cylinder.
Refill beaker **A** with 100 cm^3 of water at room temperature.
Replace the thermometer in beaker **A**.
Check the supply of hot water.

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 supplied 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 precision of 0.1 V. See note 3.
- (iii) Ammeter capable of measuring the current in the circuit shown in Fig. 3.1 with a minimum precision of 0.02 A. See note 3.
- (iv) Resistor of nominal value 4.7Ω with a power rating of at least 2W, labelled **R**.
- (v) Switch. The switch may be an integral part of the power supply.
- (vi) 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 rule is to be labelled **A**, the other end is to be labelled **B**.
- (vii) 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. 3.1.
- (viii) Sliding contact, labelled **C**. This may be a jockey or a small screwdriver connected to a lead by means of a crocodile clip.
- (ix) Sufficient connecting leads to set up the circuit shown in Fig. 3.1.

Notes

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

**Fig. 3.1**

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.

Action at changeover

Check that the circuit is arranged as shown in Fig. 3.1.
Check that the circuit works. Switch off.

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, one per candidate.
- (ii) Plane mirror with a holder. See note 1.
- (iii) Four 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 (to tie the plain A4 sheet of paper into the Question Paper). One per candidate.

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, pins and mirrors should be available.

Action at changeover

Supply a sheet of plain A4 paper and string or treasury tag, see items **(i)** and **(vii)**.

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE OCTOBER/NOVEMBER 2015)

General

The Supervisor is invited 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

