



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS

0625/52

Paper 5 Practical Test

February/March 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 **11** printed pages and **1** 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 resistance wire about 105 cm in length. 32 swg (0.274 mm diameter) constantan (Eureka) or any other wire with a resistance of approximately $8\ \Omega\ \text{m}^{-1}$ is suitable. See note 1.
- (ii) Filament lamp 2.5V, 0.3A or similar, in suitable holder. See note 2.
- (iii) Metre rule. See note 1.
- (iv) Power supply of approximately 2 to 3V. See note 3. Where candidates are provided with a variable power supply, the voltage should be set by the Supervisor and fixed, e.g. taped.
- (v) Switch. The switch may be an integral part of the power supply.
- (vi) Sufficient connecting leads to set up the circuit shown in Fig. 1.1 and 2 additional leads.
- (vii) Crocodile clip. A jockey is a suitable alternative. The question will refer to a crocodile clip.
- (viii) Ammeter capable of measuring currents up to 1.00A with a minimum resolution of 0.05A. See note 4.
- (ix) Voltmeter capable of measuring up to 3.0V with a minimum resolution of 0.1V. See notes 2 and 4.

Notes

1. The resistance wire is to be fixed to the metre rule in such a way as to allow candidates to connect a crocodile clip to points at 30 cm, 70 cm and 100 cm from the left-hand end of the wire. The 0.0 cm mark of the rule must be at the left-hand end of the wire.
2. The circuit is to be set up for candidates as shown in Fig. 1.1, with the crocodile clip not connected to the resistance wire. The voltmeter must be supplied separately. Candidates must be able easily to connect the voltmeter across the lamp.

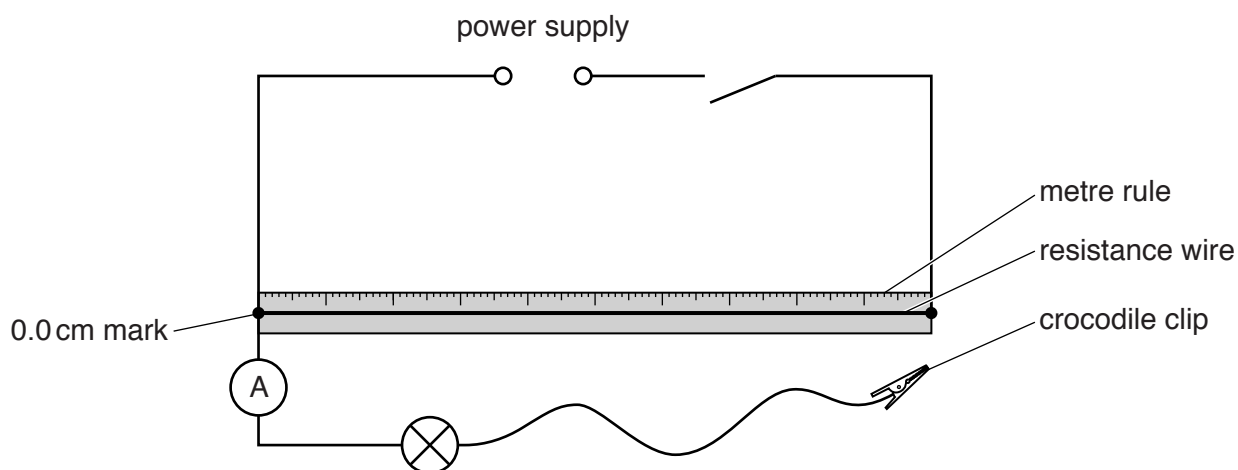


Fig. 1.1

3. If cells are used, they must remain adequately charged throughout the examination. Spare cells must be available.
4. Either analogue or digital meters are suitable. Any variable settings should be set by the Supervisor and fixed, e.g. taped.
5. Spare lamps, leads, crocodile clips and meters should be available.

Action at changeover

Check that the circuit is working. Disconnect the voltmeter. Disconnect the crocodile clip from the resistance wire. Ensure that the circuit is connected as shown in Fig. 1.1 and ensure that the circuit is switched off.

Question 2

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

- (i) Converging lens of focal length approximately 15 cm with a suitable holder. See note 2.
- (ii) Metre rule.
- (iii) Illuminated object consisting of a white rigid card with a triangular hole of height approximately 2 cm. See Fig. 2.1 and notes 1 and 2. The back of the hole is to be covered with thin translucent paper (e.g. tracing paper) secured with adhesive tape.
- (iv) Screen. A white sheet of stiff card approximately 15 cm × 15 cm, fixed to a wooden support, is suitable. See Fig. 2.2.

Notes

1. The lamp used for the illuminated object should be low voltage, 24W or greater, with a suitable power supply.
2. The lamp filament, the centre of the hole which forms the object and the centre of the lens in its holder must all be the same height above the bench.
3. The apparatus should be situated away from direct sunlight.

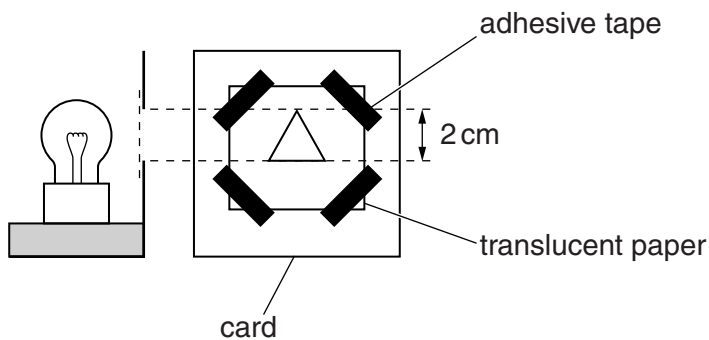


Fig. 2.1

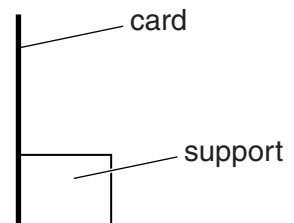


Fig. 2.2

Action at changeover

Check that the lamp works.

Question 3**Items to be supplied by the Centre (per set of apparatus unless otherwise specified)**

- (i) Metre rule with a scale graduated in mm. See note 1.
- (ii) Triangular block to act as a pivot for the metre rule. This block is to stand on the bench.
- (iii) Masses of 20g, 40g, 60g, 80g, and 100g. A standard set of 10g or 20g slotted masses is suitable. The masses must be able to stand on the rule.

Note

1. The metre rule should approximately balance on the pivot, with the scale facing upwards, when the 50 cm mark is over the pivot.

Action at changeover

Check that the apparatus is ready for the next candidate.

Turn over for Question 4.

Question 4

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

- (i) 2 test-tubes. See notes 1 and 3.
- (ii) Thermometer: -10°C to 110°C , graduated in 1°C intervals. See notes 2 and 3.
- (iii) Cork or rubber bung. See notes 2 and 3.
- (iv) 2 clamps, 2 bosses and 2 stands. See note 3.
- (v) Thin card to be used as insulation. See note 1.
- (vi) Stopclock or stopwatch or wall-mounted clock showing seconds. Candidates will be required to take readings at 30-second intervals. They may use their own wristwatches. The question will refer to a stopclock.
- (vii) Supply of hot water. See notes 4 and 5.
- (viii) Paper towels to soak up any water spillages.

Notes

1. The test-tubes must be identical. One is to be labelled **A** and the other is to be labelled **B**.

The sides of test-tube **A** are to be wrapped in one layer of thin card, as shown in Figs. 4.1 and 4.2. The sides of test-tube **B** are to be wrapped in three layers of the same card. The top of the insulation must reach the same level on each test-tube and should be taped to the test-tube, as indicated in Fig. 4.2, to prevent it from slipping along the test-tube. This level must be such that, when the test-tubes are filled with water to the level of the top of the card, they must not overflow when the thermometer and cork are inserted.

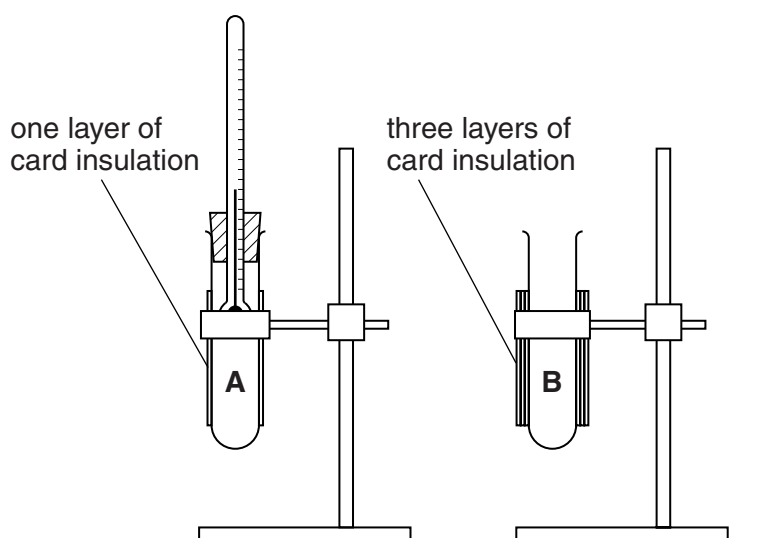


Fig. 4.1

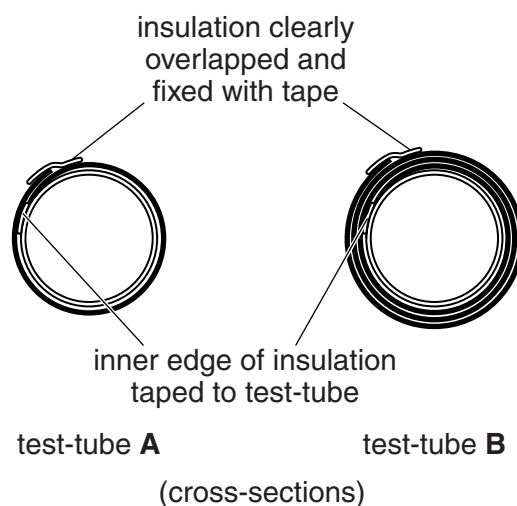


Fig. 4.2

2. The thermometer must be mounted in the cork as shown in Fig. 4.1. When inserted into the test-tubes, the thermometer bulb must be below the level of the top of the card. Candidates must be able to read temperatures down to approximately 40 °C.
3. The apparatus is to be set up as shown in Fig. 4.1, without water in the test-tubes.
4. The hot water is to be supplied for each candidate by the Supervisor. The water temperature should be between 80 °C and 100 °C.
Each candidate will require approximately 100cm³ of hot water and will need access to this at times during the experiment. They must be able to pour hot water into the test-tubes safely.
5. Candidates should be warned of the dangers of burns and scalds when using very hot water.
6. Spare test-tubes with insulation and thermometers mounted in corks or bungs should be available.

Action at changeover

Empty the water from the test-tubes. Check that the apparatus is intact and arrange as shown in Fig. 4.1.

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE FEBRUARY/MARCH 2015)

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.

The space below can be used for this, or it may be on separate paper.



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

