

PHYSICS

0625/53

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.

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) Converging lens of focal length approximately 15 cm with a suitable holder (see note 2).
- (ii) Metre rule.
- (iii) 30 cm ruler or 50 cm rule.
- (iv) Illuminated object consisting of a rigid card with a triangular hole of height approximately 2 cm (see Fig. 1.1 and notes 1 and 2). The hole is to be covered with thin translucent paper (e.g. tracing paper) secured with adhesive tape.
- (v) Screen. A white sheet of stiff card approximately 15 cm × 15 cm, fixed to a wooden support is suitable (see Fig. 1.2).

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 work station should be situated away from direct sunlight.

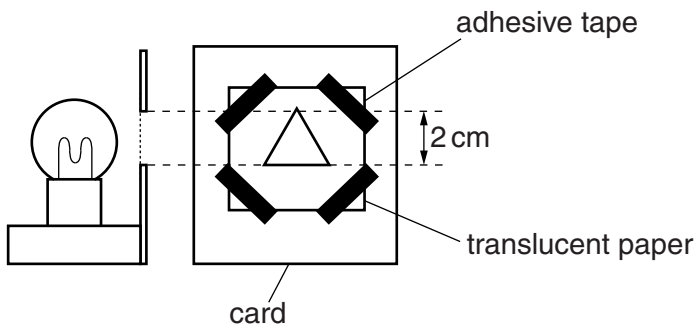


Fig. 1.1

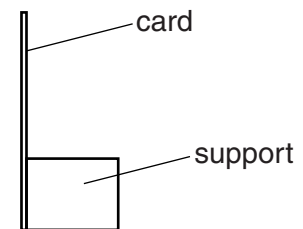


Fig. 1.2

Action at changeover

Check that the lamp works.
Switch off the lamp.

Question 2

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

- (i) 2 test-tubes (see notes 1 and 3).
- (ii) 2 thermometers: -10°C to 110°C , graduated in 1°C intervals (see notes 2 and 3).
- (iii) 2 corks (see notes 2 and 3). Rubber bungs are suitable.
- (iv) 2 clamps, 2 bosses and 2 stands (see note 3).
- (v) 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.
- (vi) Supply of hot water (see notes 4 and 5).
- (vii) Paper towels to soak up any water spillages.
- (viii) Spare test-tubes and thermometers mounted in corks.

Notes

1. The test-tubes must be identical. One tube is to be labelled **A** and one tube is to be labelled **B**. Each tube must have an indelible mark approximately 2.5 cm from the top.

Test-tube **B** should be covered in a layer of aluminium foil, as shown in Fig. 2.1. The shiny side of the foil should be outwards. The indelible mark must just show above the foil.
2. The thermometers must be mounted in the corks as shown in Fig. 2.1. When the test-tubes are filled up to the marks with water, and the corks and thermometers inserted, the thermometer bulbs must be below the water level and the water level must be below the bottom of the cork. Candidates must be able to read temperatures down to approximately 40°C .

3. The apparatus is to be set up as shown in Fig. 2.1, without water in the test-tubes.

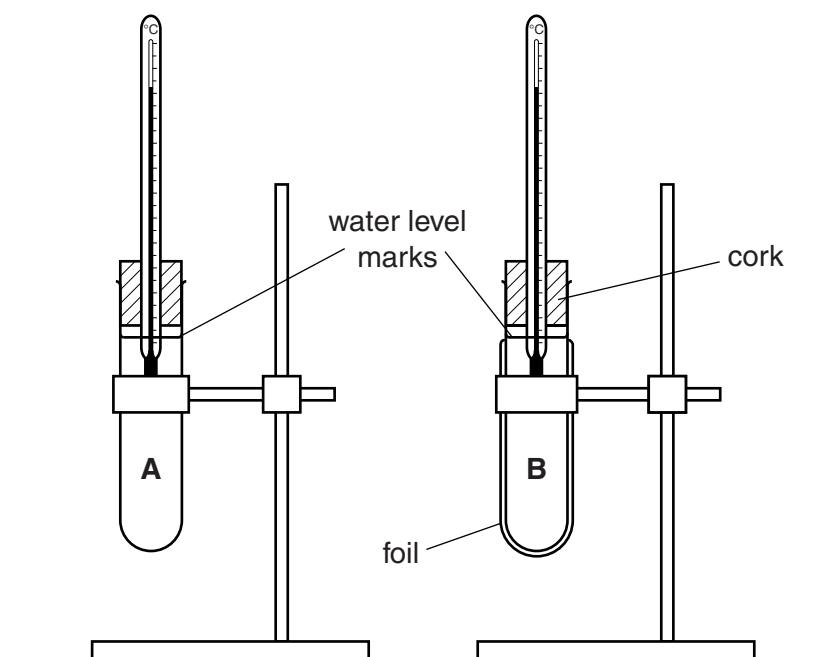


Fig. 2.1

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.

Action at changeover

Empty the water from the test-tubes.

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

Question 3

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

- (i) 3 filament lamps 2.5V, 0.3A or similar, in suitable holders (for example, see www.philipharris.co.uk – item code B8A56728) (see notes 1 and 2).
- (ii) Power supply of approximately 2.0 to 3.0V (see note 2). Where candidates are provided with a variable power supply, the voltage should be set by the Supervisor and fixed, e.g. taped.
- (iii) Switch (see note 2). The switch may be an integral part of the power supply.
- (iv) Sufficient connecting leads to set up the circuit shown in Fig. 3.1, with 5 additional leads (see notes 1 and 2).
- (v) Ammeter capable of measuring currents up to 1.00A with a minimum resolution of 0.05A (see notes 1, 2 and 4).
- (vi) Voltmeter capable of measuring up to 3.0V with a minimum resolution of 0.1V (see notes 1, 2 and 4).
- (vii) Spare lamps and leads.

Notes

1. One lamp should be connected, with the ammeter and voltmeter, between terminals marked **X** and **Y** as shown in Fig. 3.1. Candidates will be expected to insert components between terminal **Y** and the switch, but will be told not to change the connections between terminals **X** and **Y**.
2. The circuit is to be set up for candidates as shown in Fig. 3.1.

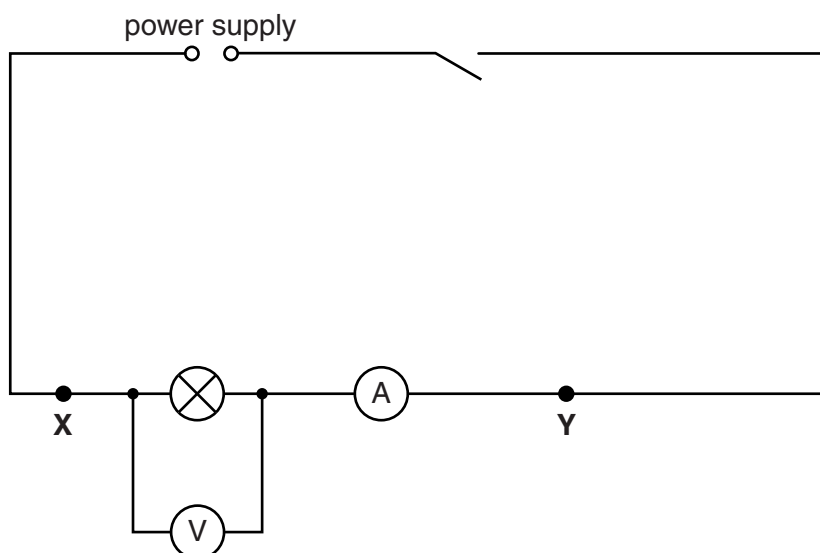


Fig. 3.1

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

Reconnect the circuit as shown in Fig. 3.1.
Check that the circuit and the two unconnected lamps are working.
Ensure that the circuit is switched off.

Question 4

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

- (i) 2 metre rules (see note 1).
- (ii) G clamp (see note 1).
- (iii) 300g mass, labelled **M** (see note 2).

Notes

1. One metre rule should be provided clamped with the 90cm mark at the edge of the bench as shown in Fig. 4.1. The 0cm mark of the scale should be at the free end of the rule and the scale of the metre rule must be facing upwards.

When arranged in this way, the free end of the rule should be no more than 100 cm above the floor. If the bench is too high to make this practicable, candidates must be provided with two rules taped together, in order easily to measure the distance between the free end of the rule and the floor.

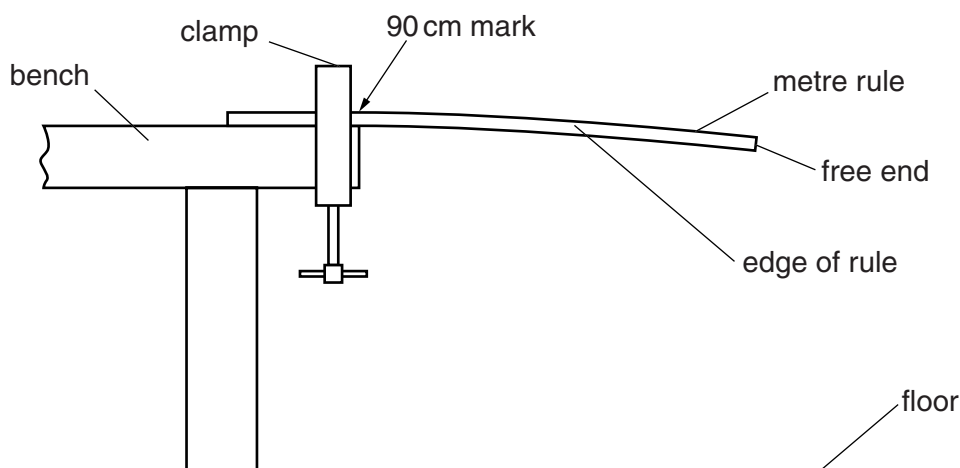


Fig. 4.1

2. The mass must be able to remain at rest on the rule when placed at the 20.0 cm mark.

Action at changeover

Remove the mass from the rule if necessary.

Check that the metre rule is clamped 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 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

