



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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PHYSICS

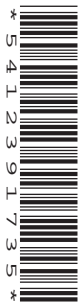
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Paper 5 Practical Test

May/June 2011

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: International@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.

This document consists of **9** printed pages and **3** 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.'

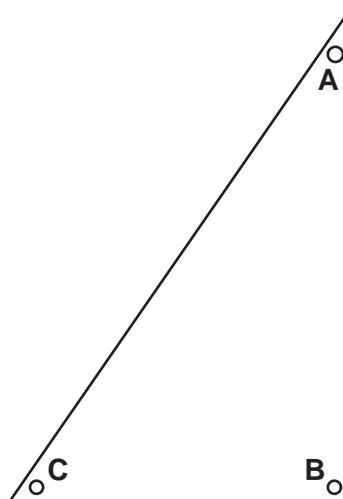
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Question 1**Items to be supplied by the Centre (per set of apparatus unless otherwise specified)**

- (i) Sheet of thin card per candidate (see notes 1 and 2).
- (ii) Clamp, boss and stand.
- (iii) Optics pin or thin nail (see note 3).
- (iv) Plumblineline (see note 4).
- (v) 50 cm or 30 cm rule. Candidates may use their own.
- (vi) A cork (see note 3).

Notes

1. The card is to be a right-angled triangle. Four such triangles may conveniently be cut from an A4 sheet. The short sides of the triangles must be $148\text{ mm} \pm 1\text{ mm}$ and $210\text{ mm} \pm 1\text{ mm}$.
2. Each card must have a small hole near each corner. These holes are to be labelled **A**, **B**, and **C** as shown in Fig. 1.1. The holes must be just large enough for the head of the pin or nail to pass through.
3. The pin or nail is to be held in a cork and the cork held in the clamp.
4. The plumblineline can be made from a length of thin thread with a small weight tied to one end and a loop at the other end. The thread should be about 30 cm long.
5. The clamp, boss, stand, cork and pin or nail are to be set up for the candidates as shown in Fig. 1.2.

**Fig. 1.1**

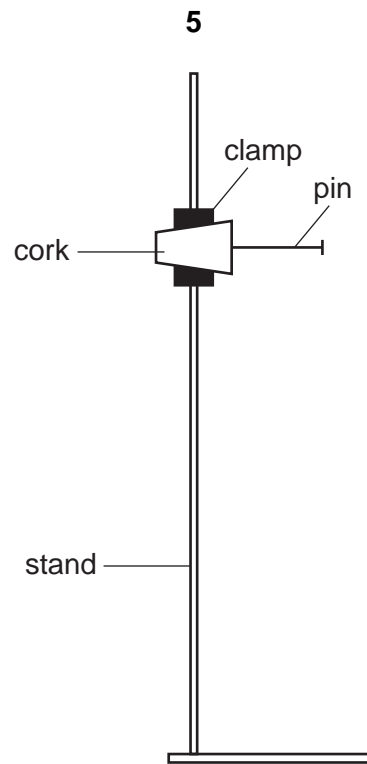


Fig. 1.2

Action at changeover

Remove the plumbline from the pin or nail. Supply a new sheet of card.

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, with the 200 cm^3 level clearly marked.
- (iii) Clamp, boss and stand.
- (iv) Stopclock, stopwatch or wall-mounted clock with a seconds sweep hand. (Candidates will be required to take readings at 30 s intervals. They may use their own wrist watch facility if they wish.) The question will refer to a stopclock.
- (v) Supply of hot water (see notes 1 and 2).
- (vi) Supply of paper towels to mop up any spillages of water.

Notes

1. A beaker containing 200 cm^3 of hot water is to be supplied for each candidate by the Supervisor. The water should be at a temperature as hot as is reasonably possible.
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 the beaker tipping.

Action at changeover

Empty the beaker. Refill the beaker with 200 cm^3 of hot water.

Question 3

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

- (i) Power source of approximately 1.5V – 2V. Where candidates are supplied with a power source with a variable output voltage, the voltage setting should be set by the Supervisor and fixed (e.g. taped).
- (ii) 2 similar lamps in suitable holders. Any low voltage lamps will suffice, provided that they glow when connected in parallel with the power supply.
- (iii) Switch (this can be an integral part of the power supply).
- (iv) Ammeter capable of reading up to 1.0 A with a minimum precision of 0.05 A.
- (v) Voltmeter capable of measuring the supply p.d. with a minimum precision of 0.1 V.
- (vi) Sufficient connecting leads to construct the circuit shown in Fig. 3.1 with two spare leads.

Notes

1. The components are to be connected by the Supervisor as shown in Fig. 3.1.

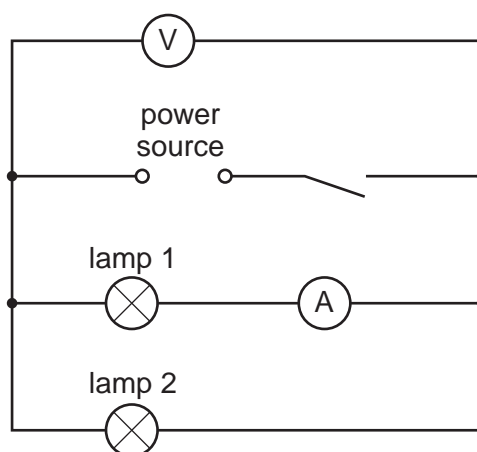


Fig. 3.1

2. The lamps are to be labelled 'lamp 1' and 'lamp 2'.
3. The candidates will be required to rearrange the circuit in a variety of ways. The circuit should be arranged so that this can be done without difficulty.

Action at changeover

Reconnect the circuit as shown in Fig. 3.1.

Question 4

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

- (i) Plane mirror with a suitable holder (see note 1).
- (ii) Sheet of plain A4 paper with a hole in one corner (one per candidate). Some spare sheets should be available.
- (iii) 3 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 rule, graduated in mm (candidates may use their own).
- (vii) Square piece of stiff card 4.0 cm × 4.0 cm fixed to a supporting block (see note 2).
- (viii) Treasury tag or string (to be used by the candidate to tie the ray trace sheet into the question paper).

Notes

1. The mirror should be capable of standing vertically with one edge on the sheet of paper.
2. The piece of card is to have one edge labelled **A** and the opposite edge labelled **B**. The card is to be fixed to a supporting block as shown in Fig. 4.1.

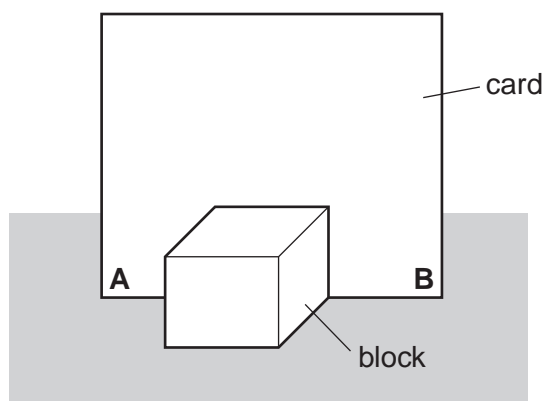


Fig. 4.1

Action at changeover

Supply a sheet of plain paper (as in (ii) above).

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE MAY/JUNE 2011)

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

