



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education



PHYSICS

Paper 5 Practical Test

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 should, as part of the preparation of the examination requirements, ensure that it is satisfactory.

The Supervisor is asked to give (and attach to the Report form printed description of the apparatus supplied, mentioning any points that are the Examiner in marking the answers. The Supervisor should also candidates. All reports should be signed by the Supervisor and by the p 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 index 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 stated)

- (i) Metre rule with a mm scale (see note 1 below).
- (ii) Triangular block to act as a pivot for the metre rule. This block is
- (iii) 100 g mass labelled **X**.
- (iv) 30 cm or 50 cm rule with a mm scale.

Notes

1. The metre rule should balance on the pivot when the 50.0 cm mark is approximately over the pivot.

Action at changeover

Check that the apparatus is ready for the next candidate.

Question 2

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

- (i) Thermometer: -10°C to 110°C , graduated in 1°C intervals.
- (ii) 100 cm^3 beaker, labelled **A** with the 75 cm^3 level clearly marked.
- (iii) 250 cm^3 beaker, labelled **B**.
- (iv) A lid large enough to cover the top of beaker **B** and with a hole in the centre just large enough to accept the thermometer. The lid can be made from a piece of card.
- (v) Boss, clamp and stand (see note 3).
- (vi) Stopclock, stopwatch or wall-mounted clock with a seconds sweep hand. (Candidates will be required to take readings at 30s intervals. They may use their own wrist watch facility if they wish.) The question will refer to a stopclock.
- (vii) Supply of hot water (see notes 1, 2 and 4).
- (viii) Supply of paper towels to mop up any spillages of water.

Notes

1. The hot water is to be supplied for each candidate by the Supervisor. The candidates will be required to refill the 100 cm^3 beaker during the experiment. The water should be maintained 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, stand and boss should 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 beakers tipping.
4. The candidates must be provided with the means easily and safely to pour hot water into the 100 cm^3 beaker.

Action at changeover

Empty the beaker. Check the supply of hot water.

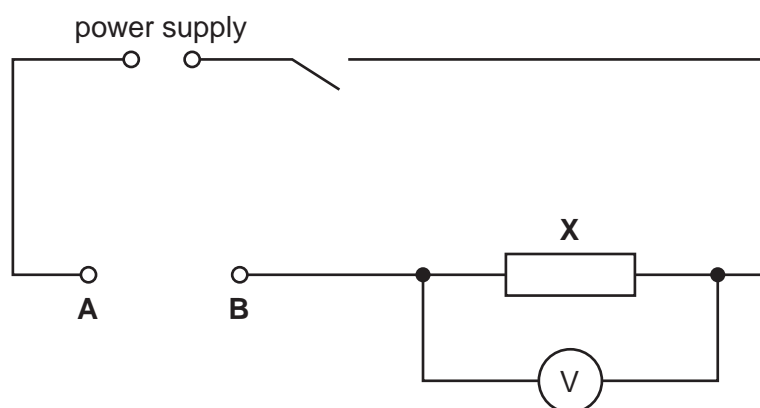
Question 3

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

- (i) Power source of approximately 1.5 – 2V. Where candidates are provided with a variable output voltage, the voltage setting should be set (e.g. taped).
- (ii) Voltmeter capable of measuring the supply p.d. with a minimum range of 0 – 2V.
- (iii) $10\ \Omega$ resistor labelled **X** (see notes 2 and 3) with a power rating of at least 2W.
- (iv) Three further resistors of nominal values $3.3\ \Omega$, $4.7\ \Omega$ and $6.8\ \Omega$ (see notes 2 and 3) each with a power rating of at least 2W.
- (v) Switch (this can be an integral part of the power supply).
- (vi) Sufficient connecting leads to set up a circuit using all the components listed with the resistors in series.

Notes

1. The circuit is to be set up for the candidates as shown in Fig. 3.1 with the additional leads within easy reach. The terminals **A** and **B** must be clearly labelled.

**Fig. 3.1**

2. The $10\ \Omega$ resistor must be clearly labelled '**X**' and have its value obscured from the candidates.
 - The $3.3\ \Omega$ resistor must be clearly labelled ' $3.3\ \Omega$ ' on the resistor.
 - The $4.7\ \Omega$ resistor must be clearly labelled ' $4.7\ \Omega$ ' on the resistor.
 - The $6.8\ \Omega$ resistor must be clearly labelled ' $6.8\ \Omega$ ' on the resistor.
3. The resistors must all have suitable terminals so that the candidates can easily and quickly connect them into the circuit.

Action at changeover

Reconnect the circuit as shown in Fig. 3.1.

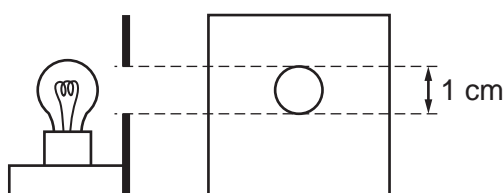
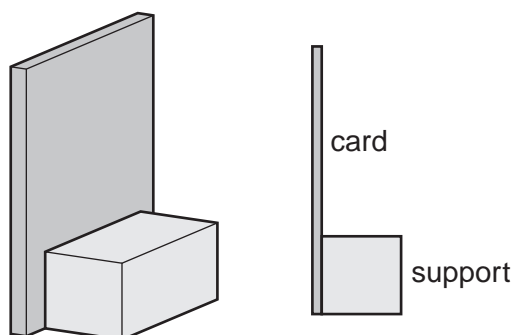
Question 4

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

- (i) Light source with a small circular hole (see Fig. 4.1). The hole has a diameter of 1.0 cm.
- (ii) Metre rule with a mm scale.
- (iii) 30 cm or 50 cm rule with a mm scale.
- (iv) Screen. A sheet of stiff white card approximately A4 size, fixed to a wooden support, is suitable, as shown in Fig. 4.2.
- (v) Circular piece of card, labelled **A**, with diameter 3.0 cm supported on a thin stick held in a suitable holder as shown in Fig. 4.3.
- (vi) Sheet of A4 graph paper (per candidate).

Notes

1. The lamp for the light source should be a low-voltage lamp, 24W or higher power, with a suitable power source. A car headlamp bulb is suitable.
2. The centre of the hole which forms the light source, the lamp filament, the centre of the circular card in its holder and the centre of the screen are all to be at the same height (approximately 15 cm) above the bench.
3. The apparatus should be situated away from direct sunlight. (Candidates will be required to see clearly the shadow formed on the screen by the circular card.)
4. The sheet of graph paper is to be taped or clipped to the screen. Each candidate will require a separate sheet of paper.

**Fig. 4.1****Fig. 4.2**

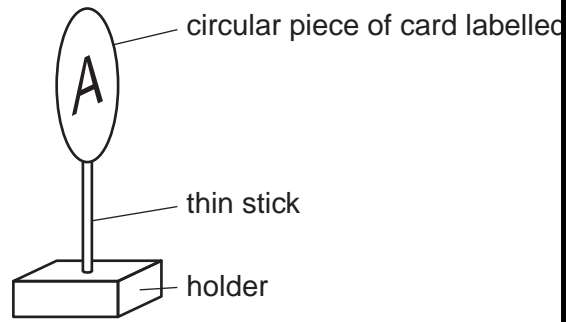


Fig. 4.3

Action at changeover

Discard the graph paper and replace with a fresh sheet.

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This form must be completed and returned with

REPORT ON PRACTICAL PHYSICS

(IGCSE OCTOBER/NOVEMBER 2010)

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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



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

