



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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PHYSICS

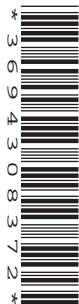
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Paper 5 Practical Test

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 **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) Metre rule.
- (ii) forcemeter with 0 – 10 N scale.
- (iii) 100 g, 200 g, 300 g, 400 g and 500 g masses. These will be placed on the metre rule (five 100 g slotted masses are suitable).
- (iv) Clamp, boss and stand.
- (v) String.
- (vi) Sellotape.

Notes

1. The apparatus is to be set up as shown in Fig. 1.1. Zero the forcemeter before attaching it to the rule. One end of the forcemeter should be attached to the clamp. The other end of the forcemeter is to be attached with string to the metre rule at the 90.0 cm mark. The string must not slip. The forcemeter will show a non-zero reading.

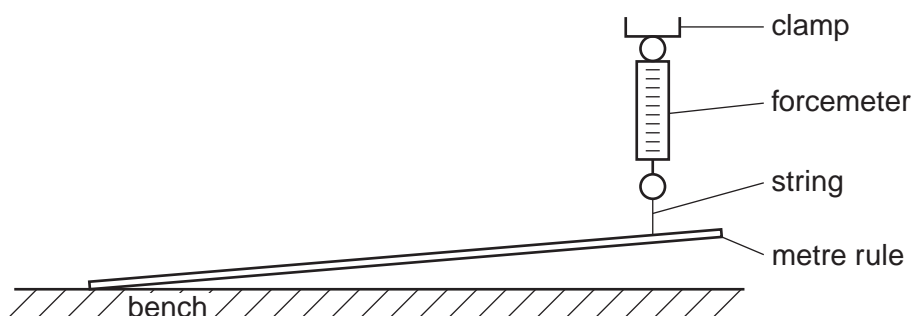


Fig. 1.1

2. The height of the forcemeter should be adjusted so that when the 500 g load is placed at the 50.0 cm mark, the 50.0 cm mark is about 1 cm above the bench.
3. A sellotape "hinge" is to be used at the zero end of the metre rule to prevent the metre rule from slipping along the bench.

Action at changeover

Check that the rule is arranged as described above and that the load is removed from the rule.

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) Test-tube (approximate size between 25 and 50 cm^3).
- (iii) Cotton wool (sufficient to wrap completely round the test-tube as shown in Fig. 2.1). Fresh cotton wool is required for each candidate. Spare cotton wool should be available.
- (iv) Two elastic bands (these will be used by the candidate to secure the cotton wool around the test-tube). Spares should be available.
- (v) Clamp, boss and stand.
- (vi) 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.
- (vii) Supply of hot water.
- (viii) Supply of paper towels to mop up any spillages of water.

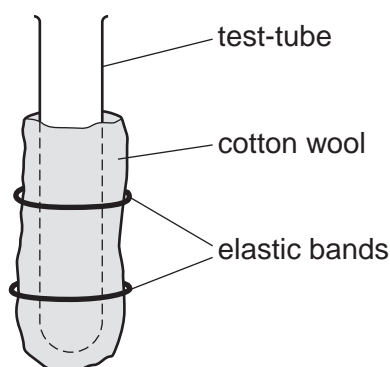


Fig. 2.1

Notes

1. The hot water is to be supplied for each candidate by the Supervisor. The water temperature 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, boss and stand should be set up with the test-tube held in the clamp.
4. The candidates must be provided with the means easily and safely to pour hot water into the test-tube.
5. Candidates will be required to refill their test-tube during the experiment.

Action at changeover

Empty the test-tube. Remove the cotton wool from the tube. Supply fresh cotton wool. Check the supply of hot water.

Question 3

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

- (i) Power source of approximately 1.5–2V. Where candidates are supplied with a power source with a variable output voltage, the voltage 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.
- (iii) Ammeter capable of reading up to 1.0 A with a minimum precision of 0.05 A.
- (iv) Approximately 105 cm of straight, bare wire, taped to a metre rule. The wire may be constantan (diameter 0.45 mm (26 swg) or 0.38 mm (28 swg) or 0.32 mm (30 swg)) or nichrome (diameter 0.45 mm (26 swg)). The taping must allow connections to be made at points **A**, **B**, **C** and **D** (see notes 3 and 4). Constantan wire is also known as eureka wire.
- (v) Crocodile clip.
- (vi) Sufficient connecting leads to set up the circuit shown in Fig. 3.1.
- (vii) Switch (this can be an integral part of the power supply).

Notes

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

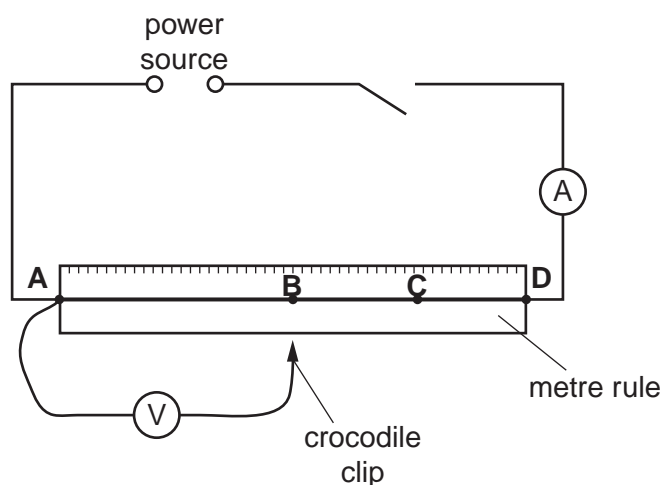


Fig. 3.1

2. If cells are used as the power source they must remain adequately charged throughout the examination.
3. Labels are to be attached to the metre rule as shown in Fig. 3.1. **A** is at the zero end of the rule, **B** at the 50.0 cm mark, **C** at the 75.0 cm mark and **D** at the 100.0 cm mark. The labels should not obscure the scale of the metre rule.
4. As an alternative to (iv) a standard 100 cm potentiometer is acceptable.

Action at changeover

Reconnect the circuit as shown in Fig. 3.1. Check that the output of the power source is close to its original value.

Question 4**Items to be supplied by the Centre (per set of apparatus, unless otherwise specified)**

- (i) Sheet of plain A4 size paper (per candidate) with a hole in one corner so that it can be tied into the Question Paper.
- (ii) Rectangular, transparent glass or Perspex block 10 cm × 6 cm × 1.5 cm or similar size.
- (iii) 4 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) String or treasury tag to tie the ray trace sheet ((i) above) into the Question Paper.

Note

Some spare sheets of plain A4 paper (as in (i) above) should be available.

Action at changeover

Supply sheet of plain A4 paper (as in (i) 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

