



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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PHYSICS

0625/53

Paper 5 Practical Test

October/November 2013

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.

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.'

Question 1

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

- (i) Disposable drinks cup with a capacity of approximately 200 cm^3 (see notes 1 and 2).
- (ii) Balance capable of measuring masses up to 300 g with a minimum resolution of 0.1 g (see note 2). This item may be shared, but enough should be available so that candidates have easy, individual access.
- (iii) 250 cm^3 measuring cylinder.
- (iv) 50 cm rule (see note 3).
- (v) A supply of water (see note 4).
- (vi) Paper towels to soak up any water spillages.

Notes

1. The cup may be of plastic, expanded polystyrene or paper.
A waterproof mark must be made approximately 1 cm from the top of the cup. This must be easily visible both inside and outside the cup and labelled **MAX** as shown in Fig. 1.1. If the cup is made from an opaque material, matching marks will be needed both on the interior and exterior.

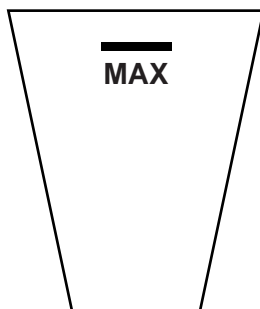


Fig. 1.1

2. The cup must be able to stand unsupported on the balance without danger of tipping.
3. If not available, a metre rule or a 30 cm ruler may be substituted.
4. Each candidate will require approximately 600 cm^3 of water. The temperature is not critical.
5. Spare, marked cups should be available in the laboratory.

Action at changeover

Check that the cup is intact and empty and that the mark has not been erased. Replace cup if necessary. Empty the measuring cylinder. Check the supply of water.

Question 2

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

- (i) Two 250 cm^3 beakers labelled **A** and **B**, each with the 200 cm^3 level marked.
- (ii) Insulation (see note 1).
- (iii) Lid (see note 1).
- (iv) Thermometer, -10°C to 110°C , graduated in 1°C intervals (see note 2).
- (v) Clamp, boss and stand (see note 2).
- (vi) Supply of hot water (see notes 3 & 4).
- (vii) 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.
- (viii) Paper towels to soak up any water spillages.

Notes

1. The beakers should be supplied as shown in Fig. 2.1.
 Beaker **A** should have a layer of insulation, such as cotton wool, corrugated cardboard or similar, fixed with rubber bands or tape. The 200 cm^3 mark should be clearly visible to candidates without removing the insulation (i.e. the mark should be visible by viewing the inside of the beaker).
 Beaker **B** should have a lid or cover, in which there is a hole to insert the thermometer. The lid could be made from a piece of card.

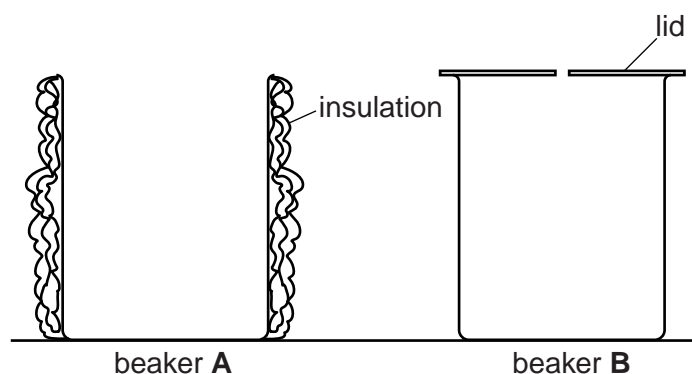


Fig. 2.1

2. The clamp, boss and stand are to be set up with the thermometer held vertically 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 either beaker **A** or **B** tipping.
3. The hot water is to be supplied for each candidate by the Supervisor. The candidates will be required to fill the beakers during the experiment. The water should be maintained at a temperature as hot as is reasonably possible. Each candidate will require approximately 600 cm^3 of hot water.

4. Candidates should be warned of the dangers of burns or scalds when using very hot water.

Action at changeover

Remove the thermometer from the beaker and empty the water from the beakers if necessary. Check the condition of the insulation and lid.

Question 3

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

- (i) Approximately 1 m of resistance wire mounted on a board or metre rule. The wire should have a resistance of approximately $6\ \Omega\text{m}^{-1}$. 30 swg constantan (also known as eureka) or 26 swg nickel-chromium wire would be suitable (see note 1).
- (ii) Power supply of approximately 1.5 to 2V. This may be a type C dry cell (see notes 2 and 3). Where candidates are provided with a variable power supply, the voltage should be set by the Supervisor and fixed, e.g. taped.
- (iii) Switch. The switch may be an integral part of the power supply.
- (iv) Ammeter capable of measuring up to 2.00 A with a minimum resolution of 0.05 A.
- (v) Voltmeter capable of measuring up to 2.5 V with a minimum resolution of 0.1 V.
- (vi) Crocodile clip.
- (vii) Sufficient leads to set up the circuit shown in Fig. 3.1.
- (viii) $1\ \Omega$, 3 W resistor, required **only** if the power supply is **not** a dry cell (see note 3).

Notes

1. The circuit is to be set up for candidates as shown in Fig. 3.1. The crocodile clip should **not** be connected to the resistance wire.

Labels **F**, **E**, **D**, **C**, **B** and **A** should be attached to the board or rule at positions 10 cm, 15 cm, 20 cm, 40 cm, 60 cm and 100 cm from the left-hand end of the resistance wire.

The left-hand end of the wire must be taped over, up to point **F**, to prevent candidates from attaching the crocodile clip in this area.

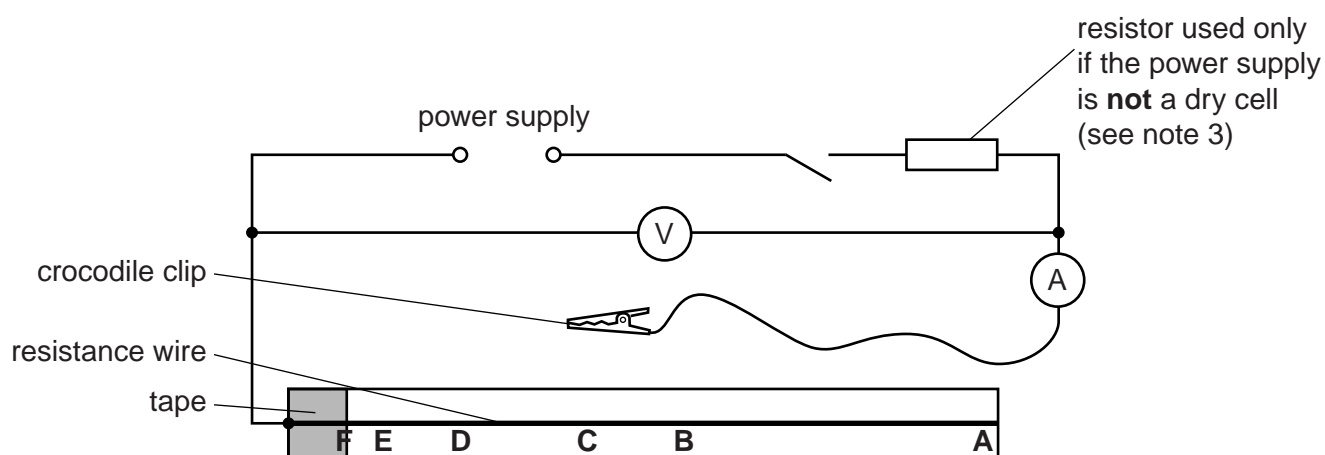


Fig. 3.1

2. If cells are used as the power supply, they must remain adequately charged throughout the examination. Spare cells should be available.
3. If the power supply is a power pack or lead acid cell, rather than a dry cell, a $1\ \Omega$, 3 W resistor must be connected in series with the power supply, as shown in Fig. 3.1.

Action at changeover

Check that the circuit is working. Disconnect the crocodile clip from the resistance wire.

Question 4

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

- (i) Plane mirror with a holder (see note 1).
- (ii) 30 cm ruler or 50 cm rule graduated in mm.
- (iii) Four optics pins.
- (iv) Pin board (e.g. a cork mat), A4 size or larger.
- (v) Protractor.
- (vi) Sheet of plain A4 size paper (per candidate) with a hole in one corner (see note 2).
- (vii) String or treasury tag (per candidate) to tie the plain A4 sheet of paper into the Question Paper.

Notes

1. The mirror should be capable of standing vertically with one edge on the sheet of plain A4 paper.
2. Spare sheets of plain paper, as in (vi) above, should be available.

Action at changeover

Supply a sheet of plain A4 paper as in (vi) above.

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE OCTOBER/NOVEMBER 2013)

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

