



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

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PHYSICS

0625/53

Paper 5 Practical Test

May/June 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 **11** printed pages and **1** blank page.

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) 100 cm³ measuring cylinder. See note 1.
- (ii) Test-tube. See note 1.
- (iii) Thread or light string, approximately 15 cm in length. See note 2.
- (iv) Top-pan balance with a minimum resolution of 1 g. This item may be shared but enough should be available so that candidates have easy, individual access.
- (v) A supply of cold water. See note 3.
- (vi) Paper towels to soak up any spillages of water.

Notes

- 1. The test-tube should be approximately 20 mm in diameter and 120 mm in length. Its mass should be no more than 25 g. When the measuring cylinder contains approximately 70 cm³ of water, the test-tube must be able to float approximately upright without touching the bottom of the measuring cylinder. It is acceptable for the floating test-tube to touch the side(s) of the measuring cylinder.
- 2. The test-tube should be supplied with the thread tied firmly around the top so that it may be suspended from the thread when required.
- 3. Each candidate will require approximately 100 cm³ of water. The temperature of the water is irrelevant.

Action at changeover

Empty any water from the measuring cylinder.
Dry the test-tube or supply a new one.
Check that the thread is still attached securely.

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. See note 1.
- (ii) Clamp, boss and stand. See note 1.
- (iii) Two 250 cm^3 beakers, one labelled **A** and the other labelled **B**. See notes 1 and 2.
- (iv) Supply of hot water. See notes 3 and 4.
- (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) Paper towels to soak up any water spills.

Notes

1. Beaker **A**, the thermometer, clamp, boss and stand are to be set up for candidates as shown in Fig. 2.1. The thermometer bulb must be well below the 100 cm^3 level of the beaker. Beaker **B** is to be available for later use.

Candidates must be able easily and safely to read temperatures up to 100°C and to move the thermometer in and out of the beakers.

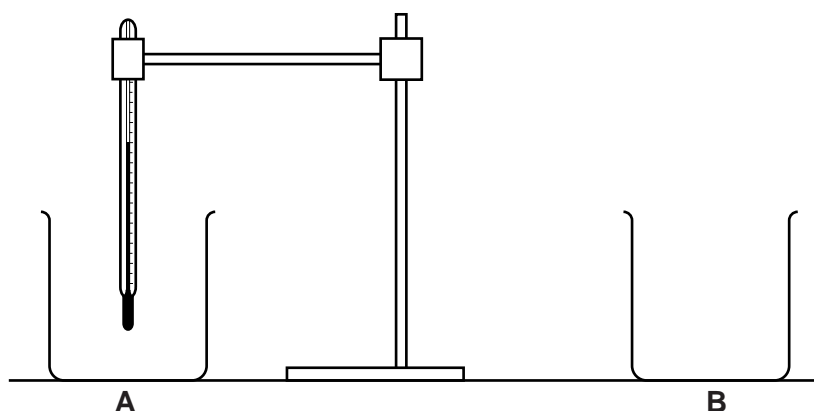


Fig. 2.1

2. If the beakers do not have volume markings, the 200 cm^3 and 100 cm^3 levels must be indicated.
3. Each candidate will require approximately 400 cm^3 of hot water. The water should be maintained at a temperature as hot as is reasonably possible.
4. Candidates should be warned of the dangers of burns or scalds when using very hot water.
5. There should be access to spare beakers, thermometers and hot water in case of breakages or spills.

Action at changeover

Empty the water from the beakers.

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

Question 3

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

- (i) Three resistance wires of identical material labelled **A**, **B** and **C**. See note 1.
- (ii) Power supply of approximately 1.5V to 2V. This may be a type C dry cell. See notes 3 and 4. Where candidates are supplied 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) Sufficient connecting leads to set up the circuit shown in Fig. 3.1. See note 2.
- (v) Two crocodile clips. See note 2.
- (vi) Ammeter capable of measuring currents up to 2.00 A with a minimum resolution of 0.05 A.
- (vii) Voltmeter capable of measuring up to 3.0V with a minimum resolution of 0.1 V.
- (viii) 1Ω , 3W resistor, required **only** if the power supply is **not** a dry cell. See note 4.
- (ix) Spare leads should be available.

Notes

1. The resistance wires should be bare 0.38mm diameter (28 swg) constantan (eureka) or any other wire with a resistance of approximately $3\Omega/\text{m}$ to $4\Omega/\text{m}$. They may be supplied as separate items or it may be more convenient to mount them on a metre rule or similar piece of wood, provided they are not able to touch.
The lengths of the wires should be as follows:
 - wire **A** – 90 cm
 - wire **B** – 60 cm
 - wire **C** – 30 cm
2. The circuit is to be set up for candidates as shown in Fig. 3.1.
Wires **A**, **B** and **C** should be capable of being connected individually between the crocodile clips.

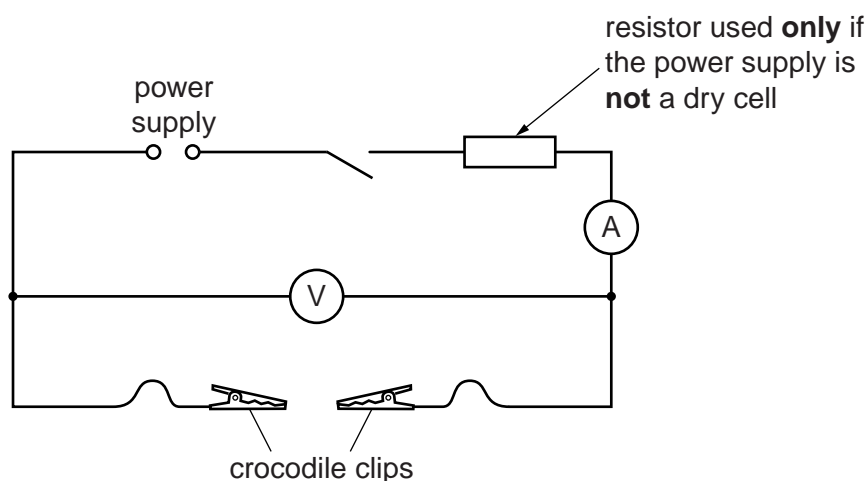


Fig. 3.1

3. If a cell is to be used as the power supply, it must remain adequately charged throughout the examination. Spare cells should be available.
4. If the power supply is a power pack or lead-acid cell, rather than a dry cell, a 1Ω , 3W 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 clips from the resistance wire.

Turn over for Question 4

Question 4

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

- (i) Object, consisting of a square rigid card 15 mm × 15 mm attached to a cocktail stick or similar and mounted securely in a cork or similar support. A possible arrangement is shown in Fig. 4.1. The object must be free standing and be capable of being moved easily during the experiment. See notes 2 and 3.
- (ii) Metre rule.
- (iii) Lamp in holder with power supply connected. A card or similar should be fixed at the side of the lamp so that it protects the candidate's eyes from glare. See notes 1, 2 and 3.
- (iv) Screen. A white sheet of stiff card 10 cm × 10 cm, fixed to a wooden support is suitable as indicated in Fig. 4.1. See notes 2 and 3.
- (v) Spare lamps should be available.

Notes

1. The lamp should be low voltage, 24 W or greater. A car headlamp bulb is suitable.
2. The lamp filament, the centre of the object and the centre of the screen must all be the same height above the bench.
3. The apparatus must be set up as shown in Fig. 4.2. The items should be in line but their positions are immaterial.
4. The apparatus should be situated away from direct sunlight.

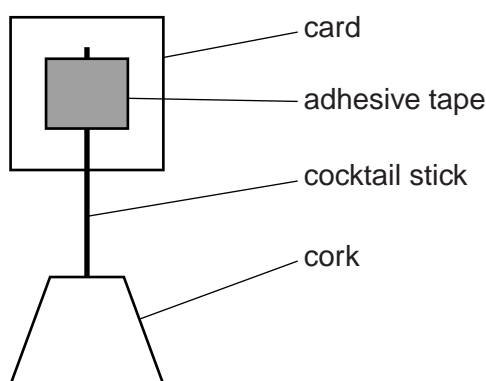
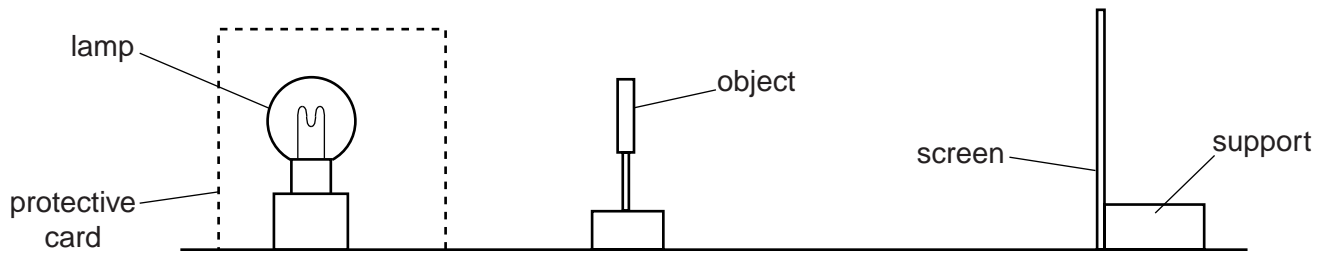


Fig. 4.1

**Fig. 4.2****Action at changeover**

Reset the apparatus as in Fig. 4.2.
Check that the lamp is switched on.

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE MAY/JUNE 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.

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

