



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**PHYSICS**

**0625/53**

Paper 5 Practical Test

**October/November 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](mailto: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 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) A lump of modelling clay (e.g. Plasticine) of mass approximately 100 g, *per candidate* (see note 1).
- (ii) 30 cm or 50 cm rule with a mm scale.
- (iii) 100 cm<sup>3</sup> measuring cylinder.
- (iv) Approximately 30 cm of thread, *per candidate* (candidates will be required to lower a small piece of the modelling clay into the measuring cylinder).
- (v) Balance capable of measuring mass to 0.1 g. One balance per set of apparatus is not essential but candidates must have easy access to a balance without delay.
- (vi) 250 cm<sup>3</sup> beaker containing approximately 200 cm<sup>3</sup> of water at room temperature.
- (vii) Supply of paper towels to mop up any spillages of water.

**Notes**

1. The modelling clay (e.g. Plasticine) should be preworked so that it is easy for the candidate to mould. It should not be of a type that will harden over the time of the experiment. It should not be of a type that will dissolve in water. It should not be porous.

**Action at changeover**

Replace the modelling clay and thread. Empty the measuring cylinder. Check that the beaker contains approximately 200 cm<sup>3</sup> of water.

**Question 2****Items to be supplied by the Centre (per set of apparatus, unless otherwise specified)**

- (i) Thermometer:  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ , graduated in  $1^{\circ}\text{C}$  intervals.
- (ii) Two  $250\text{ cm}^3$  beakers, one labelled **A**, the other labelled **B**.
- (iii)  $100\text{ cm}^3$  measuring cylinder.
- (iv) Supply of hot water (see notes 1, 3 and 5). Each candidate will require at least  $50\text{ cm}^3$ .
- (v) Supply of water at room temperature (see note 2). Each candidate will require at least  $50\text{ cm}^3$ .
- (vi) Clamp, boss and stand (see note 4).
- (vii) Supply of paper towels to mop up any spillages of water.
- (viii) Stirrer (a teaspoon is suitable).

**Notes**

1. The 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. The water at room temperature is to be supplied for each candidate by the Supervisor.
3. Candidates should be warned of the dangers of burns or scalds when using very hot water.
4. The clamp, boss and stand should be set up with the thermometer held in the clamp. The candidates must be able easily and safely to read temperatures up to  $100^{\circ}\text{C}$  and to move the thermometer in and out of the water without the danger of the beakers tipping.
5. The candidates must be provided with the means easily and safely to pour hot water into the measuring cylinder.

**Action at changeover**

Empty and dry the beakers. Check the supplies of hot water and water at room temperature.

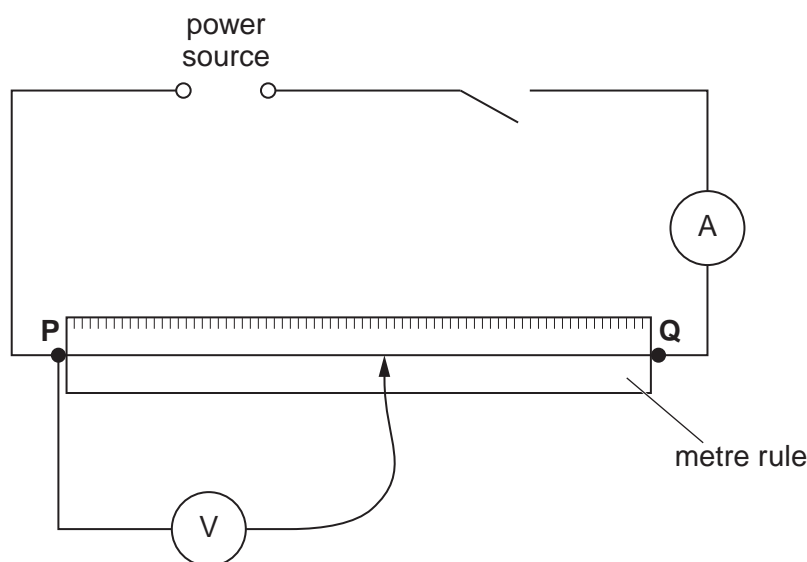
### Question 3

#### 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 setting should be set by the Supervisor and fixed (e.g. taped).
- (ii) Voltmeter capable of measuring the supply p.d. with a minimum resolution of 0.1V.
- (iii) Ammeter capable of measuring current with a minimum resolution of 0.05A.
- (iv) Switch. The switch may be an integral part of the power supply.
- (v) Approximately 105 cm of straight, bare constantan (eureka) wire, diameter 0.45 mm (26 swg) or 0.38 mm (28 swg) or 0.32 mm (30 swg), taped to a metre rule at three places (between the 5 cm and 10 cm marks, the 45 cm and 50 cm marks and the 85 cm and 90 cm marks). The zero end of the rule is to be labelled 'P', the other end is to be labelled 'Q' (see note 2).
- (vi) Two suitable terminals (e.g. crocodile clips) attached to the constantan wire at ends P and Q of the metre rule, so that connections can be made to the circuit shown in Fig. 3.1 (see note 2).
- (vii) Sliding contact. This may be a jockey or a small screwdriver connected to a lead by means of a crocodile clip.
- (viii) Sufficient connecting leads to set up the circuit shown in Fig. 3.1.

#### Notes

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



**Fig. 3.1**

2. As an alternative to (v) and (vi) a standard 100 cm potentiometer is acceptable.

#### Action at changeover

Check that the circuit is as shown in Fig. 3.1.

## Question 4

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

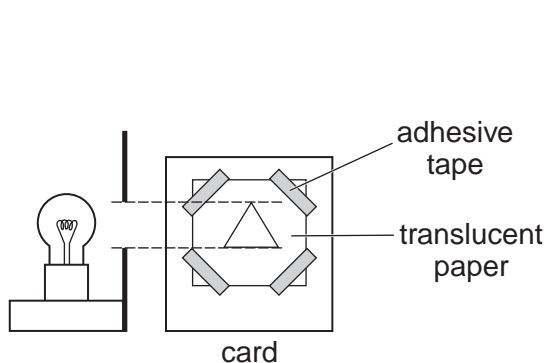
- (i) Converging lens, focal length 150 mm, with a suitable holder.
- (ii) Illuminated object with a small triangular hole (see Fig. 4.1 and Fig. 4.2). The hole is to be covered with thin translucent paper (e.g. tracing paper).
- (iii) Metre rule.
- (iv) Screen. A sheet of stiff white card approximately 150 mm × 150 mm, fixed to a wooden support, is suitable, as shown in Fig. 4.3.

### Notes

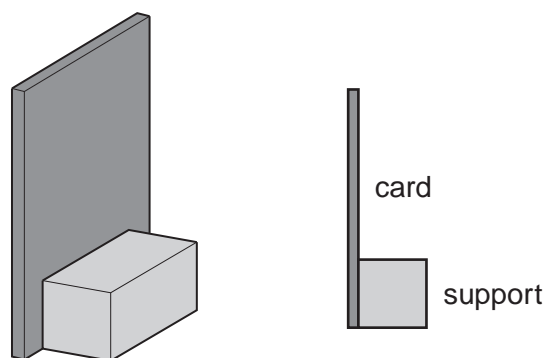
1. The lamp for the illuminated object should be a low-voltage lamp, 24W or higher power, with a suitable power source.
2. The centre of the hole which forms the object, the lamp filament, the centre of the lens in its holder and the centre of the screen are all to be at approximately the same height above the bench.
3. The apparatus should be situated away from direct sunlight.



**Fig. 4.1**



**Fig. 4.2**



**Fig. 4.3**

### Action at changeover

None

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**This form must be completed and returned with the scripts.**

**REPORT ON PRACTICAL PHYSICS**

(IGCSE OCTOBER/NOVEMBER 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.



*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

