



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**PHYSICS**

**0625/53**

Paper 5 Practical Test

**May/June 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](mailto: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 **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) Converging lens of focal length approximately 15 cm with a suitable holder.
- (ii) Metre rule.
- (iii) Illuminated object consisting of rigid card with a triangular hole of height 1.5 cm arranged with its point uppermost (see Fig. 1.1). The hole is to be covered with thin translucent paper (e.g. tracing paper) secured with adhesive tape.
- (iv) Screen. The screen may be made from a white sheet of stiff card approximately 150 mm  $\times$  150 mm, fixed to a wooden support (see Fig. 1.2).
- (v) 30 cm ruler, graduated in mm (candidates may use their own).

#### Notes

1. The lamp used for the illuminated object should be low voltage, approximately 24W or greater. A car headlamp bulb is suitable.
2. The lamp filament, the centre of the hole which forms the object, and the centre of the lens in its holder, must all be the same height above the bench.
3. The apparatus must be set up as shown in Fig. 1.3 with a distance  $u$  of 20.0 cm. The position of the screen is immaterial.
4. The apparatus should be situated away from direct sunlight.

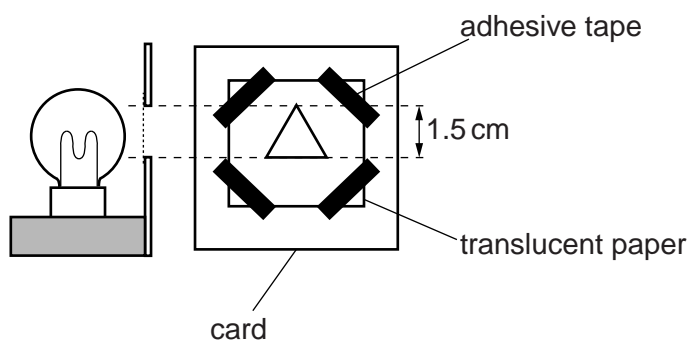


Fig. 1.1

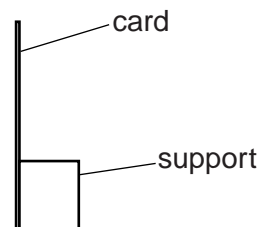


Fig. 1.2



Fig. 1.3

#### Action at changeover

Reset the apparatus, checking that  $u$  is set at 20.0 cm.

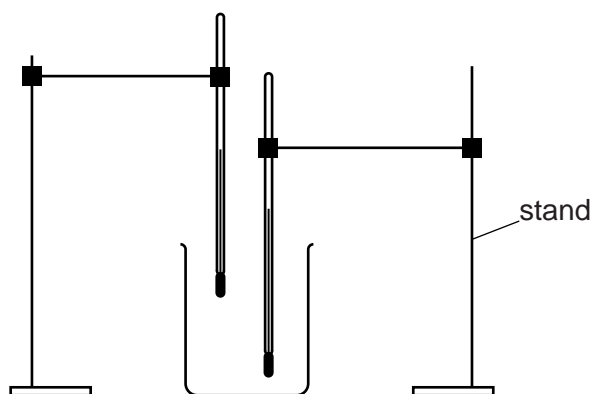
## Question 2

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

- (i) Two thermometers,  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ , graduated in  $1^{\circ}\text{C}$  intervals (see note 1).
- (ii)  $250\text{ cm}^3$  beaker.
- (iii) Two clamps, bosses and stands (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 1 minute intervals. They may use their own wristwatches. The question will refer to a stopclock.
- (vi) Paper towels to soak up any water spillages.

### Notes

1. The clamps, bosses and stands should be set up separately with a thermometer clamped securely in each, as shown in Fig. 2.1. Candidates should be able to read temperatures up to the maximum temperature of the hot water without removing the thermometers from the clamps. If more convenient, both clamps could be fixed to one stand.



**Fig. 2.1**

2. The thermometers should be arranged in the empty beaker so that one thermometer bulb is near the bottom of the beaker and the other bulb is just below the  $200\text{ cm}^3$  level.
3. The hot water is to be supplied for each candidate by the Supervisor. The water should be maintained at a temperature as hot as is reasonably possible. Each candidate will require approximately  $300\text{ cm}^3$  of hot water. The candidates must be able to pour the hot water into the beaker without disturbing the positions of the thermometers.
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 spillage.

### Action at changeover

Empty the water from the beaker and reposition the thermometers as in note 2.

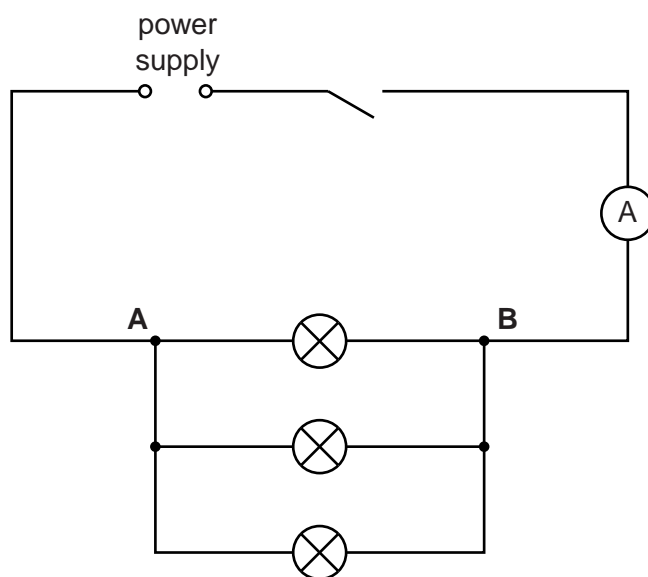
### Question 3

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

- (i) 3 filament lamps 2.5V, 0.3A or similar, in suitable holders (for example, see [www.philipharris.co.uk](http://www.philipharris.co.uk) – item code B8A56728).
- (ii) Power supply of approximately 2V. Where candidates are using a variable power supply, the voltage should be set by the Supervisor and fixed, e.g. taped (see note 2).
- (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 with 2 additional leads (see note 1).
- (v) Ammeter capable of measuring currents up to 1.00A with a minimum resolution of 0.05 A.
- (vi) Voltmeter capable of measuring up to 3.0V with a minimum resolution of 0.1 V.

#### Notes

1. The circuit is to be set up for candidates as shown in Fig. 3.1. Suitable terminals, labelled **A** and **B**, must be provided so that candidates can re-arrange the lamps easily.



**Fig. 3.1**

2. If cells are to be used as the power supply, they must remain adequately charged throughout the examination. Spare cells should be available.
3. Spare lamps and leads should be available.

#### Action at changeover

Disconnect the voltmeter.  
 Reconnect the circuit as shown in Fig. 3.1.  
 Check that the circuit is working.

## Question 4

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

- (i) Pendulum (see note 1).
- (ii) Clamp, boss and stand (see note 2).
- (iii) Split cork, or similar (see note 3).
- (iv) Stopwatch, with a minimum resolution of 0.01s. Candidates may use their own wristwatches if they have a suitable facility.
- (v) Metre rule.
- (vi) Set-square or protractor.

### Notes

1. The pendulum may be made from approximately 80 cm of thread or light string with a small bob, or piece of modelling putty, attached.
2. The clamp, boss and stand should be set up with the clamp approximately 60 cm above the bench. The boss should be taped so that candidates are not able to change the height of the clamp during the experiment.
3. The split cork should be mounted in the clamp so that the thread is held securely but so that candidates will be able subsequently to change the length of the pendulum without difficulty. The arrangement should be supplied to candidates with the bottom of the bob approximately 10 cm above the bench.
4. Spare thread (or light string) and bobs should be available in the laboratory.

### Action at changeover

Check that the thread and bob are intact and replace if necessary.  
Set the thread so that the bob is approximately 10 cm above the bench.

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

**REPORT ON PRACTICAL PHYSICS**

(IGCSE MAY/JUNE 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.

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

