

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**PHYSICS**

**0625/05**

Paper 5 Practical Test

May/June 2004

**CONFIDENTIAL INSTRUCTIONS**

**Great care should be taken that any confidential information given does not reach the candidates either directly or indirectly.**

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 index 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.'

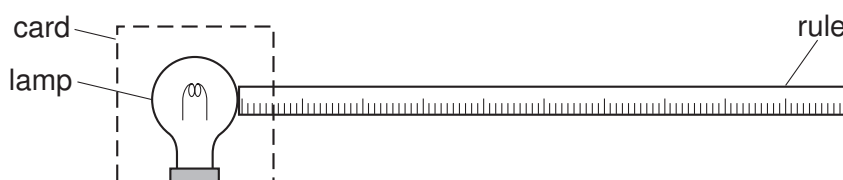
**Question 1**

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

- (i) Thermometer,  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ , capable of being read to the nearest  $1^{\circ}\text{C}$ .
- (ii) 12 V, 24 W lamp mounted in a suitable holder with an appropriate power source (a car headlamp bulb is suitable).
- (iii) 2 stands, 2 clamps and 2 bosses.
- (iv) Half-metre rule or metre rule.
- (v) A small card suitably mounted to stand vertically (see notes).

**Notes**

1. Candidates should be able to see a clock with a seconds hand. If this is not possible, then a stopwatch or stopclock should be provided with each set of apparatus.
2. The rule is to be clamped with its zero touching the outer edge of the glass surface of the lamp, as shown in Fig. 1.1.
3. The thermometer is to be held vertically in a clamp and stand with the thermometer bulb at the same height above the bench as the lamp filament.
4. A small card can be used to protect candidates from the direct glare of the lamp. The card must not prevent the candidates from observing the thermometer scale. The card should be able to stand vertically.



**Fig. 1.1**

**Action at changeover**

Check that the thermometer has cooled. (If not, supply a replacement.)

Check that the rule and lamp are in the correct positions.

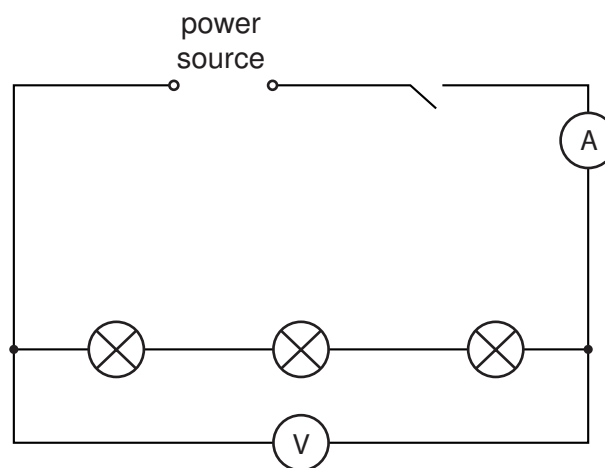
## Question 2

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

- (i) Power source of approximately 1.5 – 2.0 V. 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 precision of 0.1 V.
- (iii) Ammeter capable of reading up to 1.0 A with a minimum precision of 0.05 A.
- (iv) Three 2.5 V, 0.2 A lamps in suitable holders.
- (v) Switch (this may be an integral part of the power supply).
- (vi) Sufficient connecting leads to set up the circuit as shown in Fig. 2.1, plus two additional leads.

## Notes

1. The circuit is to be set up for the candidates as shown in Fig. 2.1.
2. The candidates will rearrange the circuit so that the lamps are in parallel.
3. If cells are used as the power source, they must remain adequately charged throughout the examination.



**Fig. 2.1**

## Action at changeover

Reconnect the circuit as shown in Fig. 2.1.

Check that the output of the power source is close to its original value.

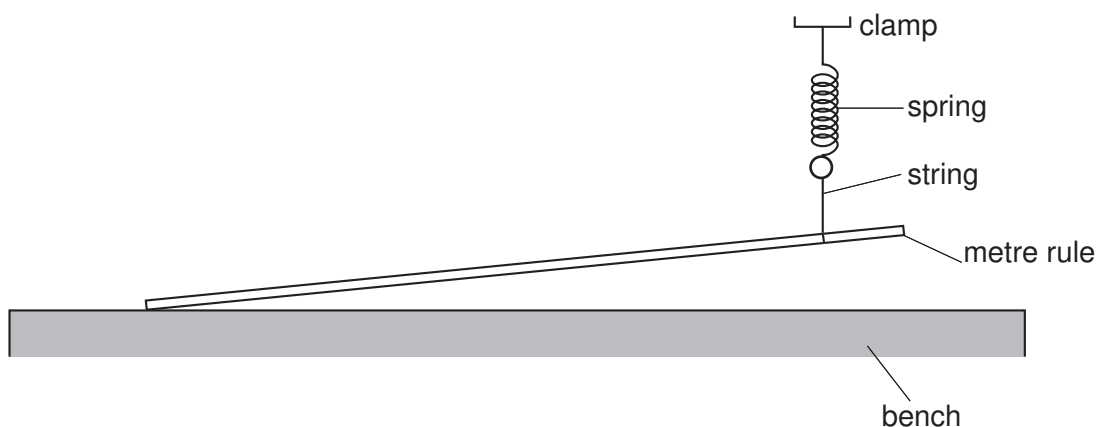
**Question 3**

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

- (i) Metre rule.
- (ii) Expendable spring, 55 mm x 15 mm diameter, capable of supporting at least 500 g without overstretching.
- (iii) 200 g mass, labelled L.
- (iv) Stopclock or stopwatch. Candidates may use their own wrist-watch facility if they wish.
- (v) Clamp, stand and boss.
- (vi) String.

**Notes**

1. The apparatus is to be set up as shown in Fig. 3.1. One end of the spring should be attached to the clamp. The other end of the spring is to be attached with string to the metre rule at the 90.0 cm mark. The string can be taped to the rule so that it does not slip.
2. The height of the spring should be adjusted so that when the 200 g load is placed at the 80.0 cm mark on the rule, the end of the rule is approximately 5 cm above the bench.
3. Sellotape may be stuck to the top surface of the metre rule (or to the bottom of the mass) so that the mass does not slip on the rule when the rule is made to oscillate.
4. 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.

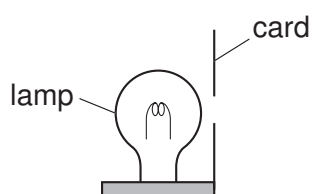
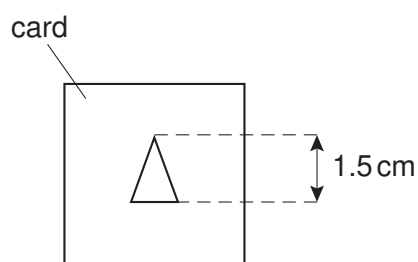
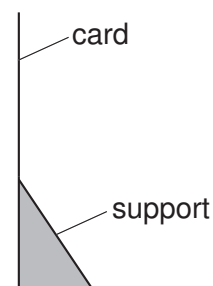
**Fig. 3.1****Action at changeover**

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

**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 triangular hole of height 1.5 cm (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 white sheet of stiff card approximately 150 mm x 150 mm, fixed to a wooden support, is suitable. See Fig. 4.3.)

**Fig. 4.1****Fig. 4.2****Fig. 4.3****Notes**

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

**Action at changeover**

None.

**Copyright Acknowledgements**

Every reasonable effort has been made to trace all copyright holders. The publishers would be pleased to hear from anyone whose rights we have unwittingly infringed.

University of Cambridge International Examinations is part of the University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

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

**REPORT ON PRACTICAL PHYSICS**

(IGCSE MAY/JUNE 2004)

*General*

The Supervisor is invited 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 index number of the places occupied by the candidates for each experiment for each session, must be enclosed with the Answer Booklets.



*Information required (cont.)*

A list by name and index 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