



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**PHYSICS**

**0625/05**

Paper 5 Practical Test

**October/November 2009**

**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 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.

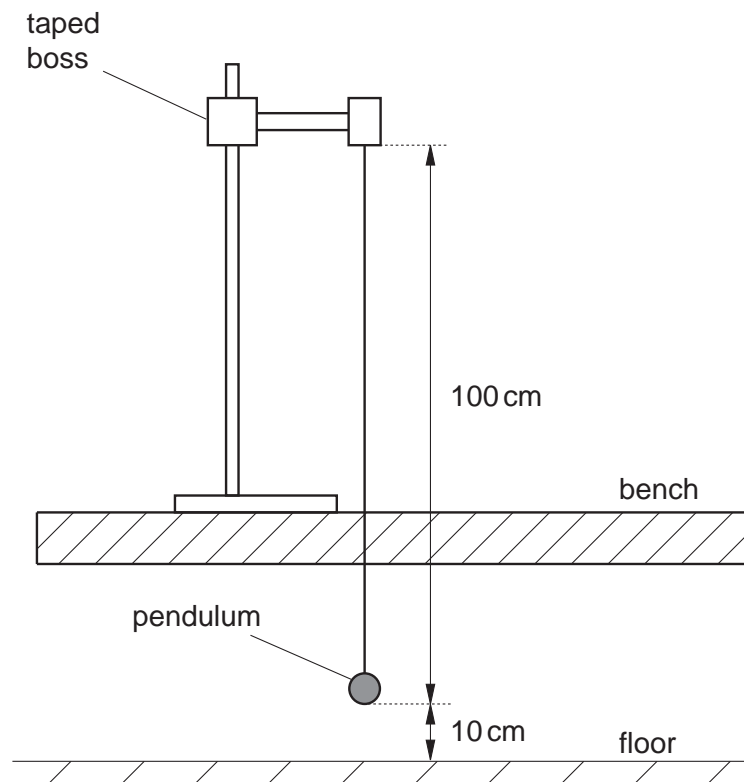
'The Examiners do not want you to waste time through inability to get on with an experiment. Any candidate, therefore, who is unable to get on with the experiment after spending five minutes at it may come to me and ask for help. I shall report to the Examiners any help given in this way, and some marks 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) Clamp, stand and boss. Tape to secure boss.
- (ii) Pendulum bob attached to approximately 110 cm of thin inextensible string.
- (iii) Metre rule.
- (iv) Stopclock or stopwatch with a minimum precision of 0.1 s. Candidates may use their own wristwatch facility if they wish.
- (v) Split cork or similar device to hold the string of the pendulum between the jaws of the clamp.

**Notes**

1. The pendulum should be set up for the candidates with length 100 cm from the bottom of the split cork to the bottom of the pendulum bob. The bottom of the pendulum bob must be 10 cm above the floor, as shown in Fig. 1.1.
2. It may be necessary to increase the stability of the clamp stand (for example, by placing a weight on the base).
3. The boss holding the clamp to the stand should be taped so that it cannot be moved.

**Fig. 1.1****Action at changeover**

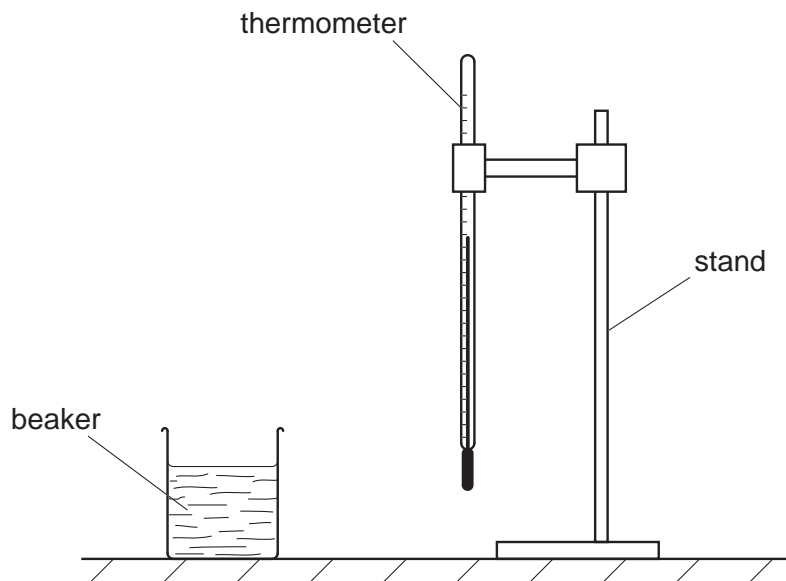
Arrange the pendulum as described in Note 1.

**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)  $250\text{ cm}^3$  beaker, containing  $250\text{ cm}^3$  of hot water.
- (iii) Metre rule.
- (iv) Boss, clamp and stand.
- (v) Wall-mounted clock with a second sweep hand, stopclock or stopwatch. (Candidates will be required to take readings at 30s intervals. They may use their own wristwatch facility if they wish. The question will refer to a stopclock.)
- (vi) Supply of paper towels to mop up any spillages of water.

**Notes**

1. The beaker of hot water, thermometer, boss, stand and clamp are to be set up for the candidate as shown in Fig. 2.1.

**Fig. 2.1**

2. The hot water is to be supplied for each candidate by the Supervisor. The water temperature should be between  $80^{\circ}\text{C}$  and  $100^{\circ}\text{C}$ .
3. Candidates should be warned of the dangers of burns and scalds when using very hot water.
4. The candidates must be able easily and safely to move the thermometer in and out of the water.

**Action at changeover**

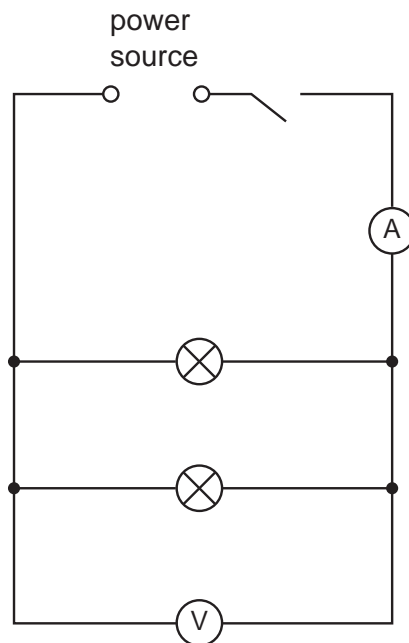
Replenish the hot water.

**Question 3****Items to be supplied by the Centre (per set of apparatus unless otherwise specified)**

- (i) Power source of approximately 1.5–2.0V. 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) Two 2.5V, 0.2A lamps in suitable holders.
- (v) Switch (this can be an integral part of the power supply).
- (vi) Sufficient connecting leads to set up the circuit shown in Fig. 3.1.

**Notes**

1. The circuit is to be set up for the candidates as shown in Fig. 3.1.
2. The candidates will rearrange the circuit so that the lamps are in series.

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

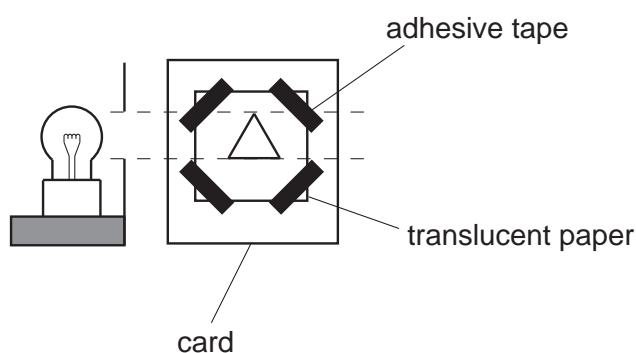
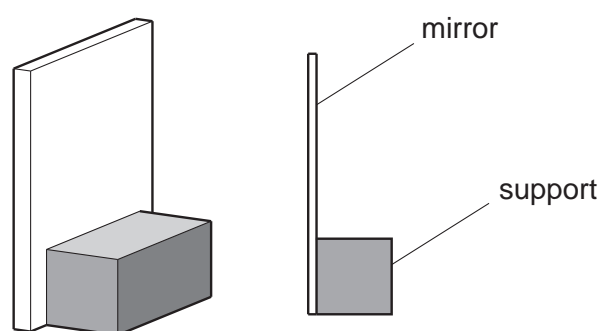
Reconnect the circuit as shown in Fig. 3.1.

**Question 4****Items to be supplied by the Centre (per set of apparatus unless otherwise specified)**

- (i) Bi-convex converging lens of focal length approximately 15 cm with a suitable holder.
- (ii) Two rectangular blocks of wood. The size of these is not critical but should be approximately 8 cm × 8 cm × 2 cm. It is important that the blocks of wood have smooth, straight sides.
- (iii) Metre rule.
- (iv) Illuminated object with a small triangular hole (see Fig. 4.1). The hole is to be covered with thin translucent paper (e.g. tracing paper)
- (v) Plane mirror fixed to a wooden support so that it stands vertically, as shown in Fig. 4.2. The height of the mirror must be at least the height above the bench of the top of the lens in its holder. The width of the mirror must be at least the diameter of the lens.

**Notes**

1. The two blocks of wood will be used to assist the candidates to take measurements on the lens.
2. The lamp for the illuminated object should be a low-voltage lamp, 24W or greater power, with a suitable power source. A car headlamp bulb is suitable.
3. The centre of the hole which 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.
4. The apparatus should be situated away from direct sunlight.
5. It must be possible for the candidate easily to remove the lens from its holder.

**Fig. 4.1****Fig. 4.2****Action at changeover**

Replace the lens in its holder.

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

**REPORT ON PRACTICAL PHYSICS**

(IGCSE OCTOBER/NOVEMBER 2009)

*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 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

