

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**PHYSICS**

**0625/05**

Paper 5 Practical Test

October/November 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 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 that you think would improve the accuracy of your experiments, and you should say, on your script, how you use any such apparatus supplied.'

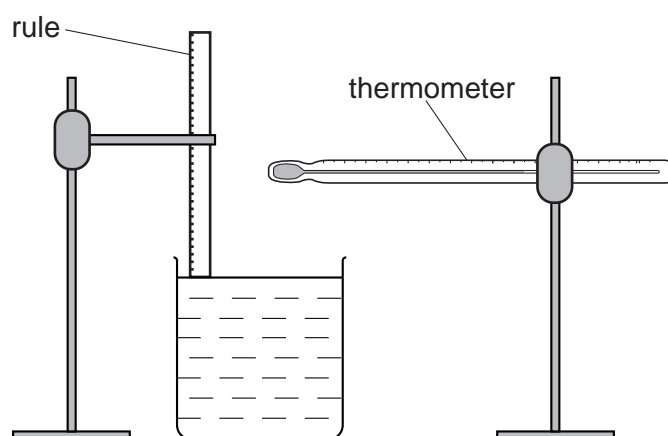
**Question 1**

*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) 2 clamps, 2 bosses and 2 stands.
- (iii) 250 ml beaker containing hot water up to a level 1 cm below the top of the beaker.
- (iv) Metre rule or half-metre rule.
- (v) Stopwatch or stopclock. Candidates may use their own wrist-watch facility if they wish.

**Notes**

1. The hot water is to be supplied for each candidate by the Supervisor. The water temperature should be between  $80^{\circ}\text{C}$  and  $100^{\circ}\text{C}$ .
2. The metre or half-metre rule is to be clamped vertically so that the zero end just touches the water surface as shown in Fig. 1.1.
3. The thermometer is to be clamped horizontally as shown in Fig. 1.1.
4. Candidates should be warned of the dangers of burns or scalds when using very hot water.
5. Cloths or tissues should be available in case of spillages.



**Fig. 1.1**

**Action at changeover**

Replace the hot water to the correct level and adjust the position of the rule if necessary.

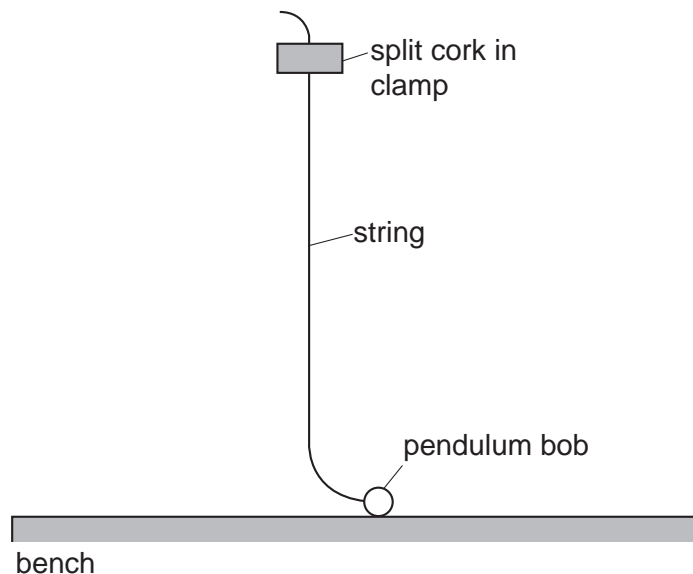
**Question 2**

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

- (i) Clamp, stand and boss.
- (ii) Pendulum bob attached to approximately 80.0 cm of thin inextensible string.
- (iii) Metre rule.
- (iv) Two rectangular blocks or strips of wood. The size of these is not critical but the longest sides should be of length equal to at least twice the diameter of the pendulum bob. It is important that the blocks or strips of wood have smooth, straight sides.
- (v) Stopclock or stopwatch with a minimum precision of 0.1 s. Candidates may use their own wrist-watch facility if they wish.
- (vi) Split cork or similar device to hold the string of the pendulum between the jaws of the clamp.

**Notes**

1. The blocks or strips of wood are to be used to assist the candidates to measure the diameter of the pendulum bob.
2. The pendulum should be set up for the candidates with the pendulum bob resting on the bench, as shown in Fig. 2.1.

**Fig. 2.1****Action at changeover**

Arrange the pendulum as shown in Fig. 2.1.

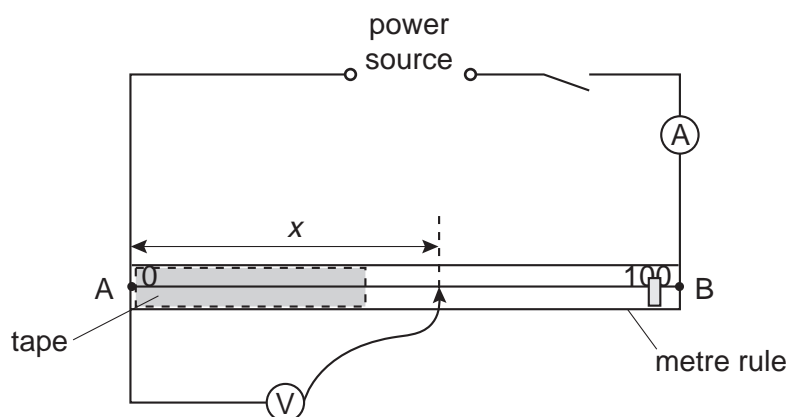
**Question 3**

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

- (i) Voltage source of approximately 1.5 – 2.0 V. Where candidates are supplied with a voltage 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) Switch. The switch may be an integral part of the power supply.
- (iv) Approximately 105 cm of straight, bare constantan wire, diameter 0.45 mm (26 swg) or 0.38 mm (28 swg) or 0.32 mm (30 swg), taped to a metre rule. The end of the wire at the zero end of the rule is to be labelled 'A', the other end is to be labelled 'B'. The first 40 cm of the wire, from end A, must be covered with an insulating tape (e.g. Sellotape).
- (v) Two suitable terminals attached to the constantan wire at the ends of the metre rule so that connections can be made to the circuit shown in Fig. 3.1.
- (vi) Ammeter capable of measuring the current in the constantan wire with a minimum precision of 0.02 A. A 0–1 A analogue meter or a digital meter would be suitable.
- (vii) Sliding contact, labelled C. 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.

**Note**

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



**Fig. 3.1**

**Action at changeover**

Check that the circuit is connected correctly.

**Question 4**

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

- (i) Sheet of plain A4 paper (*per candidate*) with a hole in one corner so that it can be tied into the Answer Booklet.
- (ii) Rectangular, transparent glass or perspex block, 10 cm x 6 cm x 1.5 cm or similar size.
- (iii) 4 optics pins.
- (iv) Pin board (e.g. a cork mat), A4 size or larger.
- (v) Protractor (candidates may use their own).
- (vi) 50 cm or 30 cm rule, graduated in mm (candidates may use their own).
- (vii) String to tie ray trace sheet ((i) above) into the Answer Booklet.

**Note**

Some spare sheets of plain A4 paper should be available.

**Action at changeover**

Supply a sheet of plain A4 paper (as in (i) above).

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

**REPORT ON PRACTICAL PHYSICS**

(IGCSE OCTOBER/NOVEMBER 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 candidate 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 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

