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**PHYSICS**

**0625/53**

Paper 5 Practical Test

**May/June 2016**

CONFIDENTIAL INSTRUCTIONS

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



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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.

### 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  $N/3$ , 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.

The order in which a given candidate attempts the four questions is immaterial. It is suggested that candidates spend **about 20 minutes on each of questions 1 to 3, followed by 15 minutes on question 4.**

### 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.

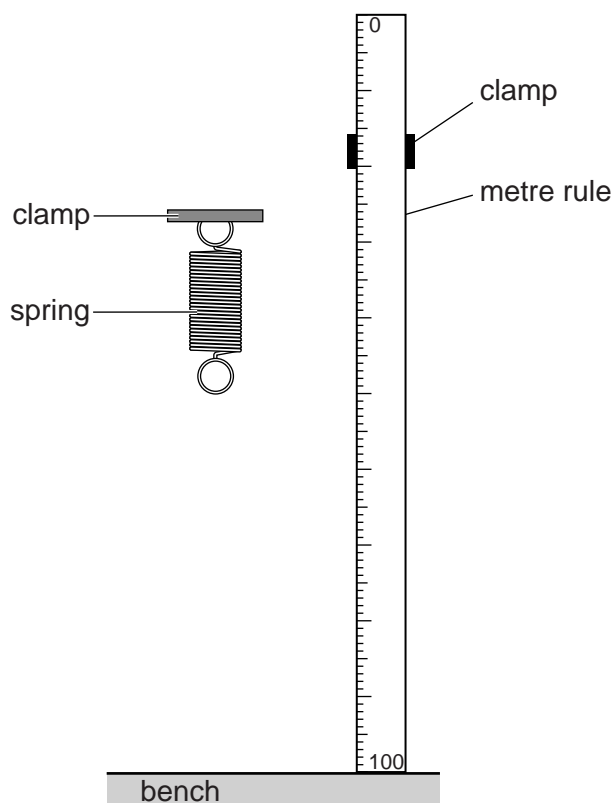
'The Examiners do not want you to waste time through inability to get on with an experiment. Any candidate, therefore, who is unable to get on with the experiment after spending five minutes at it may come to me and ask for help. I shall report to the Examiners any help given in this way, and some marks 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) Steel spring. See note 1.
- (ii) Two clamps, two bosses and two stands.
- (iii) Metre rule with a mm scale. See note 2.
- (iv) Masses of 100 g, 200 g, 300 g, 400 g and 500 g, with labels. See note 4.
- (v) A mass of 340 g, labelled X. See note 5.
- (vi) Set square.

**Notes**

1. An expendable steel spring is suitable, for example a 55 mm long spring with diameter 15 mm (see [www.philipharris.co.uk](http://www.philipharris.co.uk)). The spring must be able to take a load of at least 5 N without overstretching.
2. The metre rule is to be held vertically, using one of the clamps, with the 100 cm end in contact with the bench.
3. The apparatus is to be set up for the candidates as shown in Fig. 1.1. The spring is to be sufficiently high above the laboratory bench that when the 5 N load is hung on the spring, the bottom of the load is about 10 cm above the surface of the bench.

**Fig. 1.1**

4. A 100g mass hanger with four 100g slotted masses, each labelled 1.0N, is ideal. If these are not available a suitable, light hook must be provided so that the masses, labelled 1.0N, 2.0N, 3.0N, 4.0N, 5.0N, can be hung from the spring.
5. The value of the mass labelled **X** must not be visible to the candidates. The mass could be made from modelling clay or a bag of sand or any other suitable material. The mass must include a hook so that it can be hung from the spring.

**Action at changeover**

Check that the apparatus is set up as shown in Fig. 1.1.

**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) Three  $250\text{ cm}^3$  beakers, labelled **A**, **B** and **C**.
- (iii)  $100\text{ cm}^3$  or  $250\text{ cm}^3$  measuring cylinder.
- (iv) Clamp, boss and stand.
- (v) Supply of hot water. See notes 1 and 2.
- (vi) Insulation. See note 4.
- (vii) 2 lids. See note 5.
- (viii) Supply of paper towels to mop up any spills of water.
- (ix) Stopclock, stopwatch or wall-mounted clock showing seconds. Candidates may use their own wristwatch facility if they wish. The question will refer to a stopclock.

**Notes**

1. 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 and safely possible. Each candidate will require about  $600\text{ cm}^3$  of hot water.
2. Candidates should be warned of the dangers of burns or scalds when using very hot water.
3. The clamp, boss and stand are to 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 beaker tipping.
4. The sides of beakers **A** and **B** must be insulated with a layer of cotton wool, or bubble-wrap, or other suitable insulating material.
5. Beakers **A** and **C** must be covered with a lid. Each lid must have a hole to accept the thermometer. The lids can be made from stiff card.

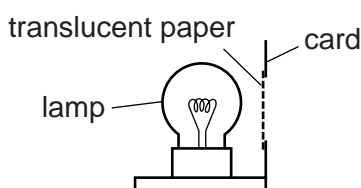
**Action at changeover**

Empty the beakers and measuring cylinder. Check the supply of hot water. Check the condition of the insulation and supply dry insulation if required. Check the condition of the lids and supply undamaged lids if required.

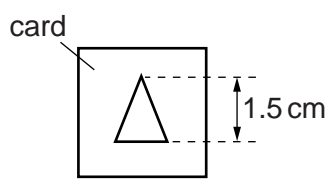
### Question 3

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

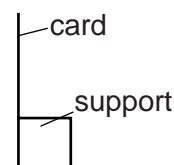
- (i) Converging lens, focal length approximately 15 cm, with a suitable holder. See note 2.
- (ii) Illuminated object consisting of stiff card with a triangular hole of height 1.5 cm (see Figs. 3.1 and 3.2). The hole is to be covered with thin translucent paper (e.g. tracing paper). See notes 1 and 2.
- (iii) Metre rule with a mm scale.
- (iv) Screen. A white sheet of stiff card approximately 15 cm × 15 cm, fixed to a wooden support, is suitable. See Fig. 3.3.



**Fig. 3.1**



**Fig. 3.2**



**Fig. 3.3**

#### Notes

1. The lamp for the illuminated object should be a low voltage lamp, approximately 24W or higher power, with a suitable power supply.
2. 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.
3. Spare lamps should be available.
4. The apparatus is to be situated away from direct sunlight.

#### Action at changeover

Check that the apparatus is ready for the next candidate.

### Question 4

No apparatus is required for this question.

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

**REPORT ON PRACTICAL PHYSICS**

(IGCSE MAY/JUNE 2016)

*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

