



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**PHYSICS**

**0625/51**

Paper 5 Practical Test

**May/June 2017**

**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 queries regarding these Confidential Instructions, please contact Cambridge stating the Centre number, the nature of the query and the syllabus number quoted above.

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The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **8** printed pages.

### Instructions for preparing apparatus

The Supervisor is **not** allowed to consult the Question Paper before the examination. The 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 Supervisor's Report 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.

In addition to the usual equipment of a physics laboratory, each candidate will require the apparatus specified in these Confidential 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 Supervisor's 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, and about 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 a candidate, with the name and candidate number of the candidate.

It is suggested that the following announcement be made to the candidates.

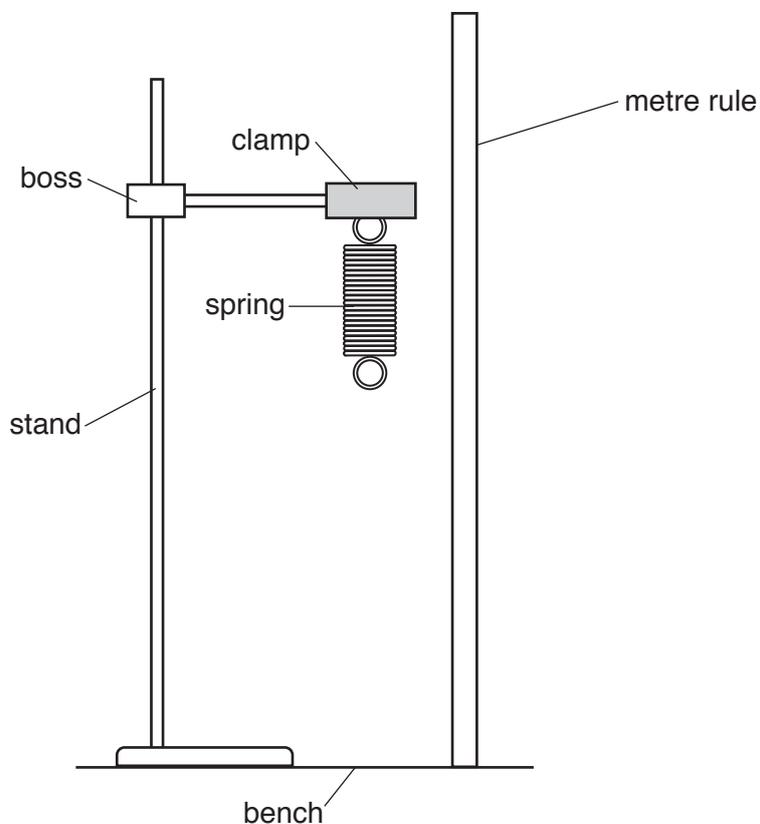
'The Examiners do not want you to waste time through inability to get on with an experiment. Any candidate, therefore, who is unable to get on with the experiment after spending five minutes at it may come to me and ask for help. I shall report to the Examiners any help given in this way, and some marks 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 mm scale. See note 2.
- (iv) Masses of 100g, 200g, 300g, 400g and 500g, with labels. See note 4.
- (v) Set-square.

**Notes**

1. An expendable steel spring is suitable, for example a 2cm long spring with diameter 15mm (see [www.philipharris.co.uk](http://www.philipharris.co.uk)). The spring must be able to take a load of at least 5N without overstretching. Spare springs should be available.
2. The metre rule is to be held vertically, using a clamp, with the 100cm 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 5N load is hung on the spring, the bottom of the load is about 10cm above the surface of the bench.

**Fig. 1.1**

4. Four 100 g slotted masses with a 100 g mass hanger, each labelled 1.0 N, is ideal. If these are not available, a light hook must be provided so that the masses, labelled 1.0 N, 2.0 N, 3.0 N, 4.0 N and 5.0 N, can be hung from the spring.

**Action at changeover**

Check that the apparatus is set up as shown in Fig. 1.1.  
Replace the spring if overstretched.

**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.
- (iii)  $100\text{ cm}^3$  or  $250\text{ cm}^3$  measuring cylinder.
- (iv) Stopclock or stopwatch or wall-mounted clock showing seconds. The question will refer to a stopclock.
- (v) Supply of hot water. See notes 1 and 2.
- (vi) Supply of paper towels to mop up any spillages of water.

**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  $250\text{ cm}^3$  of hot water.
2. Candidates should be warned of the dangers of burns or scalds when using very hot water.

**Action at changeover**

Empty the beaker and measuring cylinder.  
Dry the thermometer.  
Check the supply of hot water.

### Question 3

#### 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 Question Paper.
- (ii) Rectangular, transparent glass or Perspex block, 10 cm × 6 cm × 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 ruler, graduated in mm (candidates may use their own).
- (vii) String or treasury tag (*per candidate*) to tie the ray-trace sheet ((i) above) into the Question Paper.

#### Notes

1. Spare sheets of plain paper should be available.
2. Spare pins should be available.

#### Action at changeover

Supply a sheet of plain A4 paper (as in (i) above) and string or a treasury tag (as in (vii) above).

### Question 4

No apparatus is required for this question.

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

### **SUPERVISOR'S REPORT**

#### *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).*

The preparation of the practical examination has been carried out so as to maintain fully the security of the examination.

SIGNED .....  
Supervisor