



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

PHYSICS

0625/51

Paper 5 Practical Test

October/November 2012

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,
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 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.

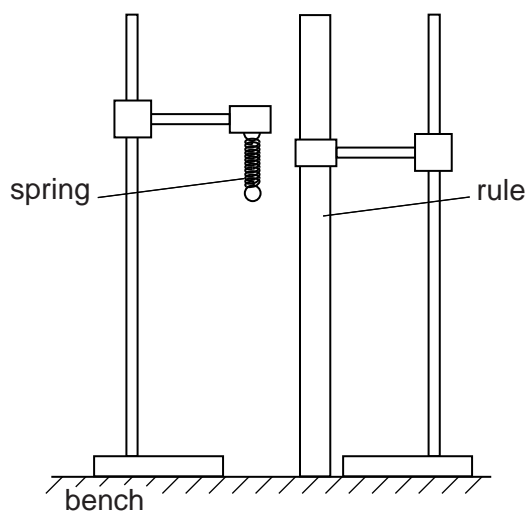
'The Examiners do not want you to waste time through inability to get on with an experiment. Any candidate, therefore, who is unable to get on with the experiment after spending five minutes at it may come to me and ask for help. I shall report to the Examiners any help given in this way, and some marks may be lost for the help given. You may ask me for additional apparatus 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 (see note 2).
- (iv) Masses of 100 g, 200 g, 300 g, 400 g and 500 g, labelled 1 N, 2 N, 3 N, 4 N and 5 N (see note 4).

Notes

1. An expendable steel spring is suitable, for example a 55 mm long spring with diameter 15 mm (see 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 zero 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 100 g mass hanger with four 100 g slotted masses, each labelled 1 N, is ideal. If these are not available a suitable light hook must be provided so that the masses 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°C to 110°C , capable of being read to the nearest 1°C .
- (ii) 250 cm^3 beaker.
- (iii) 250 cm^3 measuring cylinder.
- (iv) Clamp, boss and stand.
- (v) Stopclock, stopwatch or wall-mounted clock showing seconds. Candidates will be required to take readings at 30s intervals. They may use their own wrist watch facility if they wish. The question will refer to a stopclock.
- (vi) Supply of hot water (see note 1).
- (vii) 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 candidates will be required to empty and refill the beaker during the experiment. The water should be maintained at a temperature as hot as is reasonably possible. Each candidate will require about 500 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 should be set up with the thermometer held in the clamp. The candidates must be able easily and safely to read temperatures up to 100°C and to move the thermometer in and out of the water without the danger of the beaker tipping.
4. The candidates must be provided with the means easily and safely to pour hot water into the 250 cm^3 measuring cylinder and beaker.

Action at changeover

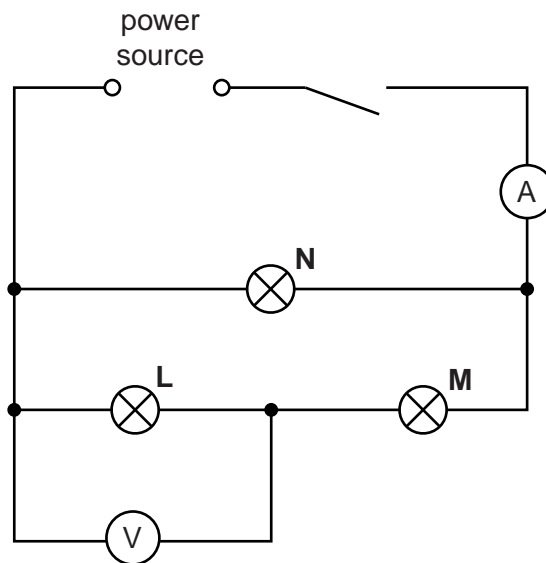
Empty the beaker and measuring cylinder. Check the supply of hot water.

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

- (i) Power source of approximately 1.5V – 2V. Where candidates are supplied with a variable power source, the voltage should be set by the Supervisor and fixed (e.g. taped).
- (ii) Voltmeter capable of measuring the supply voltage with a minimum resolution of 0.1V.
- (iii) Ammeter capable of measuring the current in the circuit shown in Fig. 3.1 with a minimum resolution of 0.02A. Either a 0 – 1 A analogue meter or a digital meter would be suitable.
- (iv) Three identical lamps labelled **L**, **M** and **N**. Any low-voltage lamps will suffice, provided that they glow when connected in the circuit shown in Fig. 3.1.
- (v) Switch. The switch may be an integral part of the power source.
- (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.

**Fig. 3.1**

2. The candidates will be required to rearrange the circuit. The circuit should be arranged so that this can be done without difficulty.

Action at changeover

Reconnect the circuit as shown in Fig. 3.1. Check the lamps.

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 Question Booklet.
- (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 rule, graduated in mm (candidates may use their own).
- (vii) String or treasury tag (*per candidate*) to tie ray-trace sheet ((i) above) into the Question Paper.

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) and string or a treasury tag (as in (vii) above).

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE OCTOBER/NOVEMBER 2012)

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

