



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS

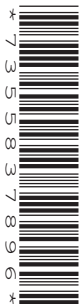
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Paper 5 Practical Test

May/June 2014

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: 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.

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. 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.

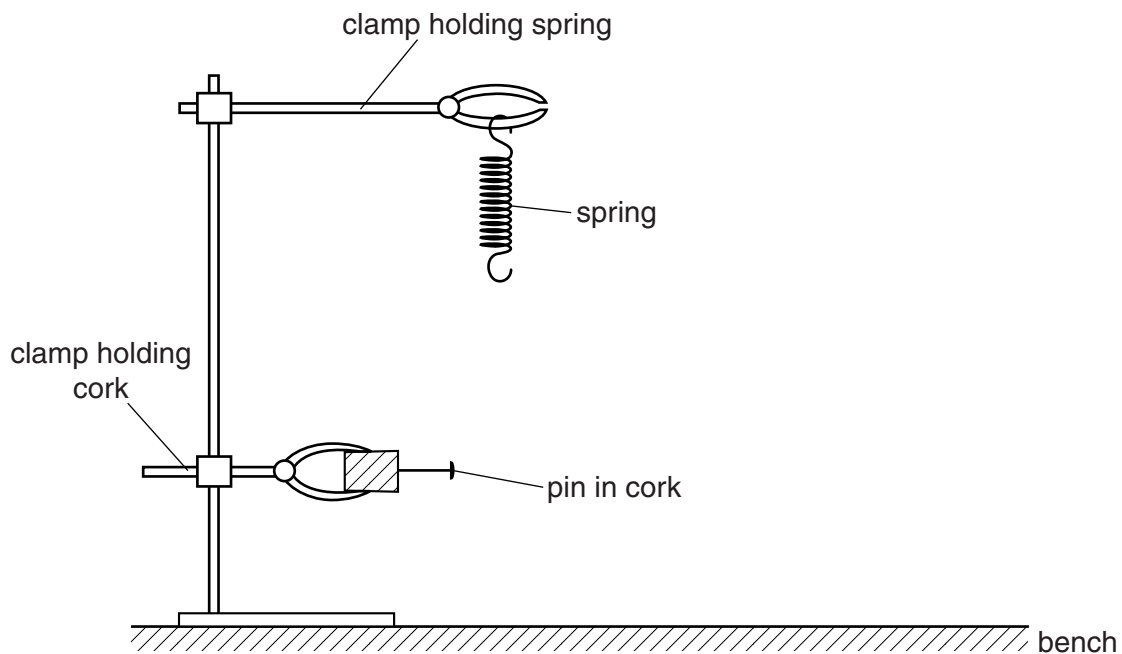
'The Examiners do not want you to waste time through inability to get on with an experiment. Any candidate, therefore, who is unable to get on with the experiment after spending five minutes at it may come to me and ask for help. I shall report to the Examiners any help given in this way, and some marks 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) Expendable spring, approximately 20 mm coiled length \times 15 mm diameter, capable of supporting at least 500 g without overstretching (e.g. Philip Harris expendable steel spring, B8G87194, www.philipharris.co.uk). See note 1.
- (ii) Metre rule.
- (iii) A 300 g mass and a 500 g mass. See note 2.
- (iv) 2 clamps, 2 bosses and a stand. See notes 3 and 4.
- (v) A pin mounted in a cork. See note 3.
- (vi) Stopwatch.

Notes

1. The spring must be capable of executing at least 10 complete oscillations (down, up and back down) when one of the masses is suspended from the spring and given a small vertical displacement.
2. Four 100 g slotted masses and a 100 g mass holder would be suitable. Alternatively, a suitable light hook must be provided so that each mass can be hung from the spring.
3. Set up the apparatus as shown in Fig. 1.1, with no mass attached to the spring. The pin should be positioned so that when a mass is attached to the spring, the pin is close to the mass.
4. The height of the top clamp must be such that when the 500 g mass is suspended from the spring it is well clear of the bench.

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

Check that the apparatus is set up ready for the next candidate, as shown in Fig. 1.1.
Replace the spring if necessary.

Question 2**Items to be supplied by the Centre (per set of apparatus, unless otherwise specified)**

- (i) Thermometer: -10°C to 110°C , graduated in 1°C intervals.
- (ii) 250 cm^3 beaker containing approximately 200 cm^3 of hot water. See note 2.
- (iii) 250 cm^3 beaker loosely filled with cotton wool.
- (iv) Clamp, boss and stand.
- (v) 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.
- (vi) Supply of paper towels to soak up any spillages of water.

Notes

1. The clamp, boss, and stand are to be set up with the thermometer held in the clamp. The candidates must be able to read temperatures up to 100°C .
2. The hot water is to be supplied for each candidate by the Supervisor. The water temperature should be between 80°C and 100°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

Replace the hot water.

Check that the thermometer is arranged as described in note 1.

Check that the cotton wool is dry. Replace if necessary.

Question 3

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

- (i) Power supply of approximately 1.5V – 2V. Where candidates are provided with a power supply with a variable output voltage, the voltage setting should be set by the Supervisor and fixed (e.g. taped).
- (ii) A lamp in a suitable holder. Any low voltage lamp will suffice, provided that it glows when connected as shown in Fig. 3.1, with the sliding contact at point **X**.
- (iii) Switch. The switch may be an integral part of the power supply.
- (iv) Ammeter capable of reading up to 1.00 A with a minimum precision of 0.05 A.
- (v) Voltmeter capable of measuring the supply p.d. with a minimum precision of 0.1 V.
- (vi) Metre rule.
- (vii) Approximately 55 cm of straight, bare constantan (eureka) wire (diameter 0.45 mm (26 swg) or 0.38 mm (28 swg) or 0.32 mm (30 swg)) taped to a metre rule only between the 3 cm and 7 cm marks and between the 43 cm and 47 cm marks. The end of the wire at the zero end of the rule is to be labelled **X**. The wire is to be labelled **Y** at the 25.0 cm mark. The wire is to be labelled **Z** at the 50.0 cm mark. The candidates will be required to make connections at points **X**, **Y** and **Z**.
- (viii) Sliding contact, labelled **S**. This may be a jockey or a small screwdriver connected to a lead by means of a crocodile clip.
- (ix) Sufficient connecting leads to construct the circuit shown in Fig. 3.1, with two spare leads.
- (x) Spare lamps and spare leads should be available.

Notes

1. The components are to be connected by the Supervisor as shown in Fig. 3.1.

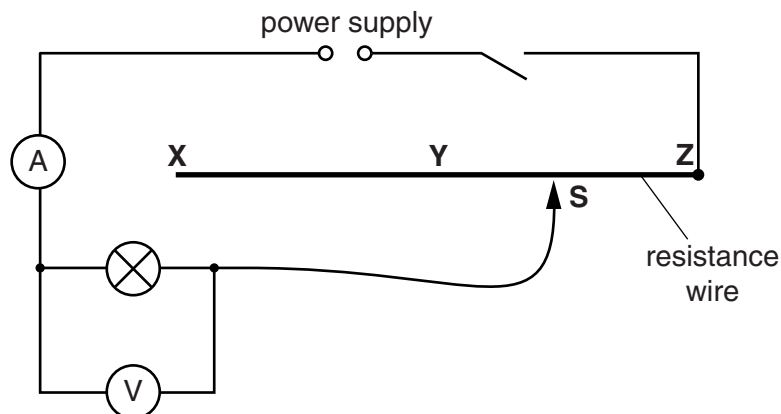


Fig. 3.1

2. If a cell is to be used as the power supply, it must remain adequately charged throughout the examination. Spare cells should be available.

Action at changeover

Check that the circuit is arranged as shown in Fig. 3.1.
Check the power supply and lamp.

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

- (i) Sheet of plain A4 size paper with a hole in one corner, one per candidate. See note 2.
- (ii) Plane mirror with a holder. See note 1.
- (iii) Four optics pins.
- (iv) Pin board (e.g. a cork mat), A4 size or larger.
- (v) Protractor.
- (vi) 50 cm or 30 cm rule, graduated in mm.
- (vii) String or treasury tag (to tie the plain A4 sheet of paper into the Question Paper), one per candidate.

Notes

1. The mirror should be capable of standing vertically with one edge on the sheet of plain A4 paper.
2. Spare sheets of plain paper should be available.
3. Spare pins should be available.
4. Spare mirrors should be available.

Action at changeover

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

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE MAY/JUNE 2014)

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

