



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

PHYSICS

0625/05

Paper 5 Practical Test

May/June 2009

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 index 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) 250 cm³ measuring cylinder.
- (ii) 250 cm³ beaker, containing 250 cm³ of water at room temperature.
- (iii) Glass boiling tube (large test-tube) of length approximately 15 cm and diameter approximately 2.5 cm.
- (iv) Metre rule.
- (v) Two rectangular blocks of wood. The size of these is not critical but the height and width should be more than the diameter of the test-tube. Typical dimensions of the blocks might be 6 cm × 3 cm × 3 cm. It is important that the blocks or strips of wood have smooth, straight sides.
- (vi) Thin, strong thread (about 40 cm).
- (vii) Thin wooden rod (a pencil would be suitable).
- (viii) A balance to measure the mass of the test-tube to the nearest gram. It is not necessary to have one balance per set of apparatus but candidates must have easy access to a balance without undue delay.

Notes

1. The blocks of wood are to be used to assist the candidates to measure the external diameter of the test-tube.
2. The thread should be tied round the top of the test-tube so that it can be easily lowered into the measuring cylinder.
3. The measuring cylinder must be sufficiently wide for the test-tube to fit easily inside.
4. The wooden rod will be used to push the test-tube below the surface of water in the measuring cylinder.
5. Cloths or tissues should be available in case of spillages.

Action at changeover

Empty water from the measuring cylinder and test-tube. Replenish the water in the beaker.

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

- (i) Two identical thermometers, -10°C to 110°C capable of being read to the nearest 1°C (see Note 1 below).
- (ii) 2 clamps, 2 bosses, 2 stands.
- (iii) Wall-mounted clock with a seconds sweep hand, stopclock or stopwatch. (Candidates will be required to take readings at 30 s intervals. They may use their own wristwatch facility if they wish. The question will refer to a stopclock.)
- (iv) 250 cm^3 beaker containing hot water.

Notes

1. The thermometers are to be labelled **A** and **B**. Thermometer **B** is to have cotton wool wrapped around the bulb and held in place with thread or an elastic band. The thickness of the cotton wool could be anything up to 0.5 cm. The cotton wool should be dipped in water prior to the examination.
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 or scalds when using very hot water.
4. Each thermometer is to be held vertically using a clamp, boss and stand.
5. The candidates must be able easily and safely to move the thermometers in and out of the water.
6. Cloths or tissues should be available in case of spillages.

Action at changeover

Replenish the supply of hot water. Check that the cotton wool around the bulb of thermometer **B** is still in place.

Question 3

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

- (i) Power source of approximately 1.5–2.0V. Where candidates are supplied with a power 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 only between the 3 cm and 7 cm marks and between the 93 cm and 97 cm marks. 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**.
- (v) Two suitable terminals (e.g. crocodile clips) 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. For example, 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.

Notes

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

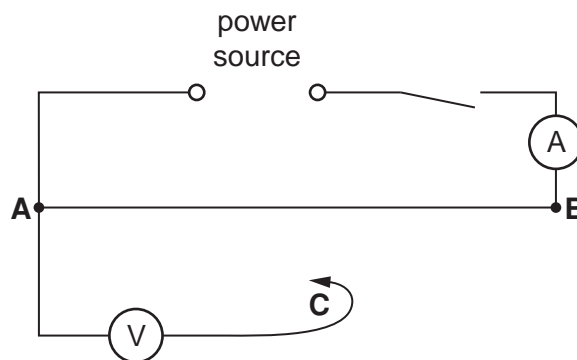


Fig. 3.1

2. If cells are used as the power source they must remain adequately charged throughout the examination.

Action at changeover

Check that the circuit is connected correctly. If cells are used, check that they are adequately charged.

Question 4

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

- (i) Converging lens, focal length 150 mm, with a suitable holder.
- (ii) Illuminated object with a small triangular hole (see Fig. 4.1 and Fig. 4.2). The hole is to be covered with thin translucent paper (e.g. tracing paper).
- (iii) Metre rule.
- (iv) Screen. A sheet of stiff white card approximately 150 mm × 150 mm, is suitable, fixed to a wooden support, as shown in Fig. 4.3.

Notes

1. The lamp for the illuminated object should be a low-voltage lamp, 24W or greater power, with a suitable power source. A car headlamp bulb is suitable.
2. The centre of the hole which forms the object, the lamp filament, the centre of the lens in its holder and the centre of the screen are all to be at the same height above the bench.
3. The apparatus should be situated away from direct sunlight.



Fig. 4.1

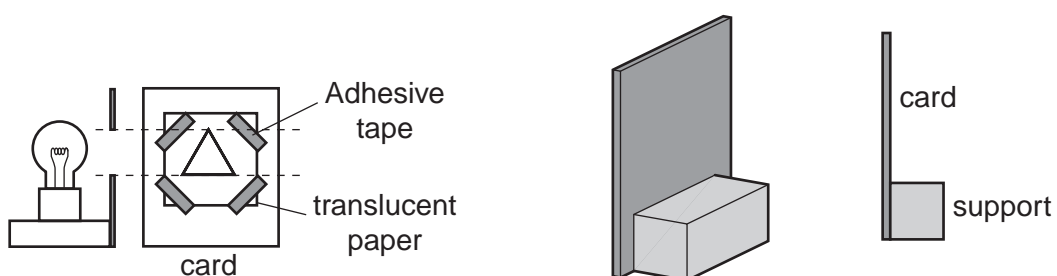


Fig. 4.2

Fig. 4.3

Action at changeover

None.

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This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

(IGCSE MAY/JUNE 2009)

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.

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

