
PHYSICS

0625/53

Paper 5 Practical Test

May/June 2018

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 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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This 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 Physics Practical 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) 250 cm³ beaker. See notes 1 and 3.
- (ii) Two lids to fit the beaker, labelled **A** and **B**. See note 2.
- (iii) Thermometer: –10 °C to 110 °C, graduated in 1 °C intervals. See note 1.
- (iv) Clamp, boss and stand. See note 1.
- (v) Stopclock or stopwatch or wall-mounted clock showing seconds. Candidates will be required to take readings at 30-second intervals. They may use their own wristwatches. The question will refer to a stopclock.
- (vi) Supply of hot water. See notes 4 and 5.
- (vii) Paper towels to soak up any water spillages.

Notes

1. The thermometer, clamp, boss and stand are to be set up for candidates as shown in Fig. 1.1. The thermometer bulb must be well below the 100 cm³ level of the beaker. Candidates must be able easily and safely to read temperatures up to 100 °C and to move the thermometer in and out of the beaker.

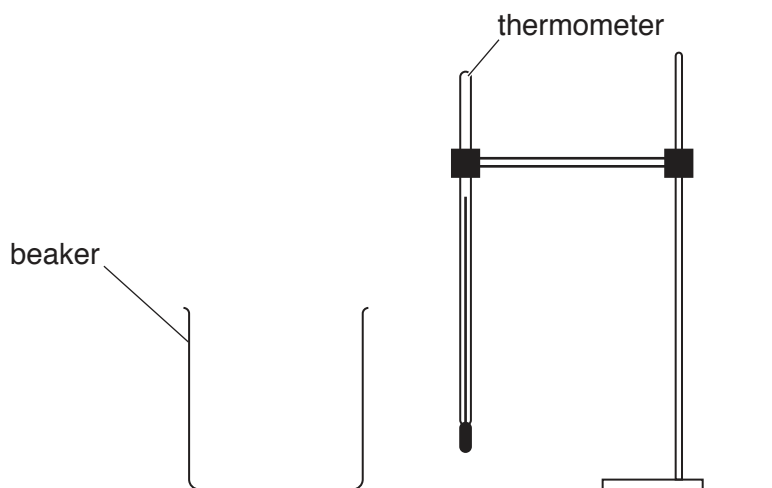


Fig. 1.1

2. Thin cardboard is a suitable material for the lids.
Lid **A** and lid **B** must be cut to shape as shown in Fig. 1.2 and Fig. 1.3. They must each be stable when partly covering the beaker as shown.

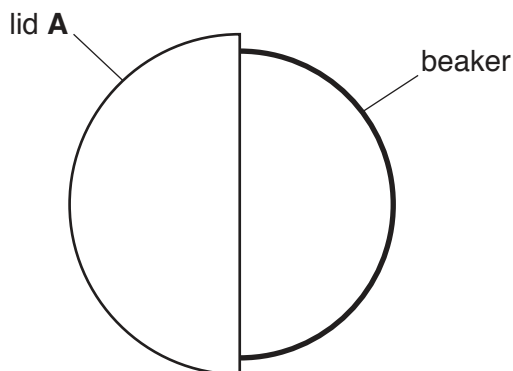


Fig. 1.2

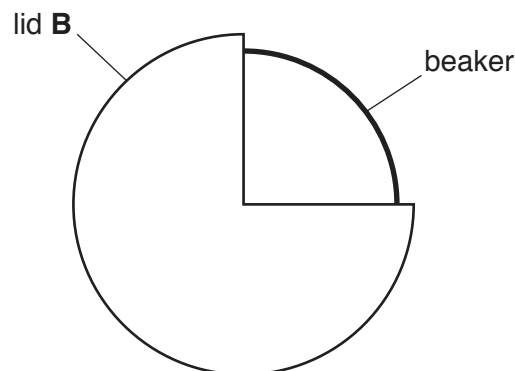


Fig. 1.3

3. If the beaker does not have volume markings, the 100 cm^3 level must be indicated.
4. Hot water is to be available for each candidate throughout the experiment. The hot water should be maintained at an approximately constant temperature between 80°C and 90°C . Each candidate will require about 250 cm^3 of hot water in total.
They must be able to pour hot water into the beakers safely. Candidates will need to dispose of hot water during the experiment.
5. Candidates should be warned of the dangers of burns and scalds when using very hot water.

Action at changeover

Empty the water from the beaker. Check that the apparatus is intact and is arranged as in Fig. 1.1. Spare lids, labelled **A** and **B**, must be available.

Question 2

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

- (i) One 2W resistor approximately 2Ω , labelled 'fixed resistor'. See note 2.
- (ii) Three 2W resistors, approximately 1Ω , 3Ω and 10Ω , labelled **X**, **Y** and **Z** respectively. See notes 1 and 2.
- (iii) Power supply of approximately 2V–3V. See note 3.
Where candidates are provided with a variable power supply, the voltage should be set by the Supervisor and fixed, e.g. taped.
- (iv) Switch. The switch may be an integral part of the power supply.
- (v) Sufficient connecting leads to set up the circuit shown in Fig. 2.1.
- (vi) Ammeter capable of measuring currents up to 1.00A with a resolution of at least 0.05A . See note 4.
- (vii) Voltmeter capable of measuring up to 3.0V with a resolution of at least 0.1 V . See note 4.

Notes

1. These resistors must have suitable terminals so that candidates are able easily and quickly to connect **X**, **Y** and **Z** into the circuit.
2. The circuit is to be set up for candidates as shown in Fig. 2.1. The fixed resistor is to remain in the circuit during the experiment.

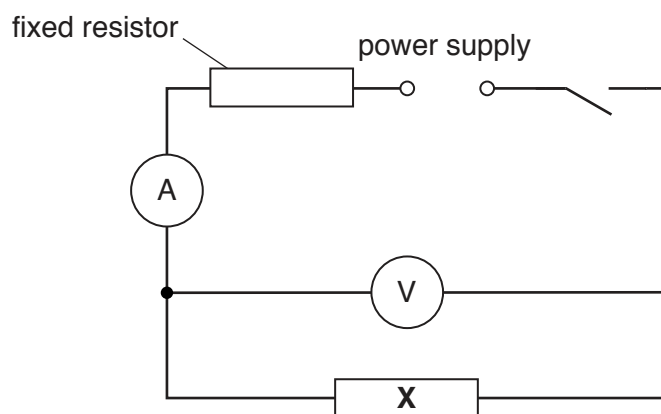


Fig. 2.1

3. If cells are used, they must remain adequately charged throughout the examination. Spare cells must be available.
4. Either analogue or digital meters are suitable. Any variable settings should be set by the Supervisor and fixed, e.g. taped. Spare meters should be available.

Action at changeover

Connect the circuit as shown in Fig. 2.1. Ensure that resistor **X** is connected in the circuit. Check that the circuit is working.
Switch the circuit off.

Question 3

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

- (i) Converging lens of focal length between 14 cm and 16 cm with a suitable holder.
- (ii) Metre rule calibrated in mm.
- (iii) Illuminated object consisting of rigid card with a triangular hole of height 1.5 cm to 2.0 cm (see Fig. 3.1). The hole is to be covered with thin translucent paper (e.g. tracing paper) secured with adhesive tape. See note 1.
- (iv) Plain white screen. A white sheet of stiff card approximately 150 mm × 150 mm, fixed to a wooden support, is suitable (see Fig. 3.2).
- (v) 50 cm or 30 cm ruler, graduated in mm. Candidates may use their own.

Notes

1. The lamp used for the illuminated object should be low voltage, 24 W or greater, with a suitable power supply.
2. The lamp filament, the centre of the hole which forms the object and the centre of the lens in its holder must all be the same height above the bench.
3. The apparatus should be situated away from direct sunlight.

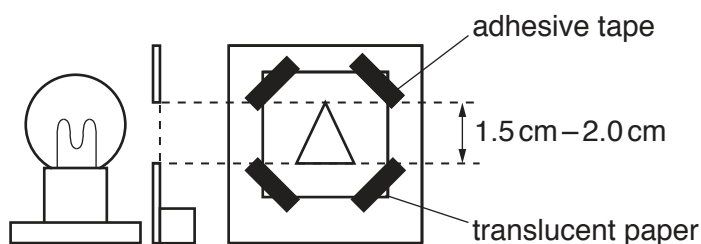


Fig. 3.1

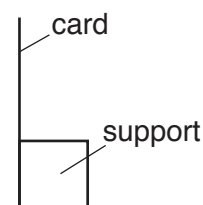


Fig. 3.2

Action at changeover

Check that the apparatus is intact and that the lamp is working.
 Replace or re-cover the screen if it has been marked.
 Switch off.

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