

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 Supervisor's 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.

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 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) Metre rule with a scale graduated in mm. See note 1.
- (ii) Triangular block to act as a pivot for the metre rule. This block is to stand on the bench.
- (iii) Mass of 20g, labelled **Q**. The mass must be able to stand on the rule.

Note

1. The metre rule should approximately balance on the pivot, with the scale facing upwards, when the 50 cm mark is over the pivot.

Action at changeover

Check that the apparatus is ready for the next candidate.

Question 2

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

- (i) Two lamps, one 2.5 V, 0.3 A or similar, labelled **X**, and the other 6 V, 0.4 A or similar, labelled **Y**. See note 2.
- (ii) Power supply of approximately 2 V to 3 V. 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.
- (iii) Switch. The switch may be an integral part of the power supply.
- (iv) Sufficient connecting leads to set up the circuit shown in Fig. 2.1, with 4 spare leads.
- (v) Ammeter capable of measuring currents up to 1.00 A with a resolution of at least 0.05 A. See note 4.
- (vi) Voltmeter capable of measuring up to 3.0 V with a resolution of at least 0.1 V. See note 4.

Notes

1. The circuit is to be set up for candidates as shown in Fig. 2.1. The voltmeter must have leads and terminals that enable it to be connected to different parts of the circuit.

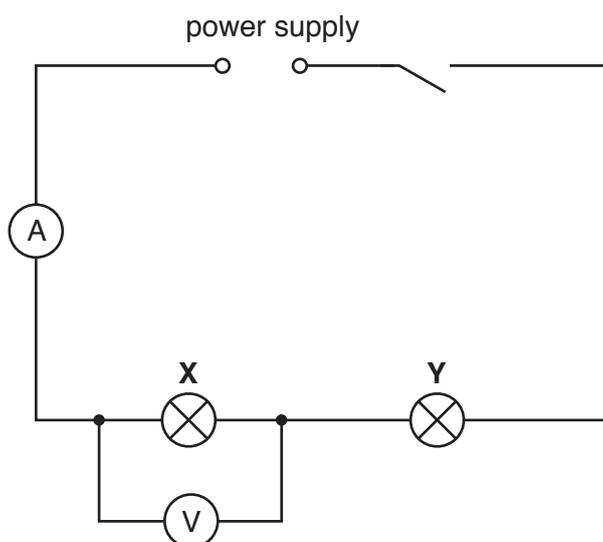


Fig. 2.1

2. The lamps must have suitable terminals so that candidates are able easily and quickly to rearrange the circuit. Spare lamps should be available.
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 and 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) Thermometer: -10°C to 110°C , graduated in 1°C intervals. See note 1.
- (ii) Clamp, boss and stand. See note 1.
- (iii) 250 cm^3 beaker. See notes 1 and 2.
- (iv) Supply of hot water. See notes 3 and 4.
- (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) Paper towels to soak up any water spills.

Notes

1. The thermometer, clamp, boss and stand are to be set up for candidates as shown in Fig. 3.1. The thermometer bulb must be well below the 100 cm^3 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.

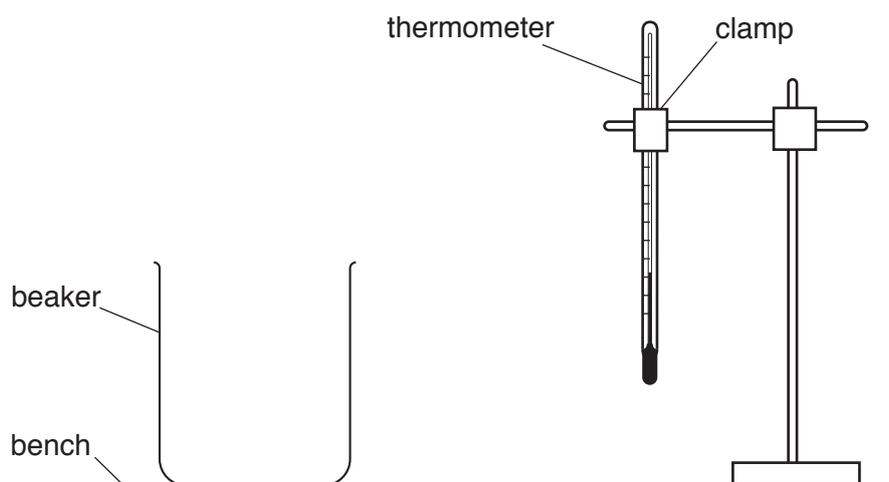


Fig. 3.1

2. If the beaker does not have volume markings, the 200 cm^3 and 100 cm^3 levels must be indicated on the beaker.
3. 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 100°C . Each candidate will require about 400 cm^3 of hot water in total. They must be able to pour hot water into the beaker safely.
4. Candidates must be warned of the dangers of burns or 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. 3.1.

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