



Cambridge International Examinations

Cambridge International General Certificate of Secondary Education (9–1)

PHYSICS

0972/05

Paper 5 Practical Test

For Examination from 2018

SPECIMEN 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 email: 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.

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 $N/3$, 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, followed by 15 minutes on question 4.

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) Metre rule with a mm scale (see note 1 below).
- (ii) Triangular block to act as a pivot for the metre rule. This block is to stand on the bench.
- (iii) 30 g mass (see note 2 below).
- (iv) A selection of masses so that candidates can use masses of 40 g, 50 g, 60 g, 70 g and 80 g (eight 10 g slotted masses would be suitable).

Notes

- 1. The metre rule should balance on the pivot when the 50 cm mark is approximately over the pivot.
- 2. The 30 g mass is to be taped to the metre rule so that its centre is at the 90.0 cm mark. The value of the mass is not to be given or to be visible to the candidates. Label this mass **X**.

Action at changeover

Check that the 30 g mass remains correctly taped to the metre rule.

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) Test-tube (approximate size between 25 and 50 cm³).
- (iii) Cotton wool (sufficient to wrap completely around the test-tube as shown in Fig. 2.1). Fresh cotton wool is required for each candidate. Spare cotton wool should be available.
- (iv) Two elastic bands (these will be used by the candidate to secure the cotton wool around the test-tube). Spares should be available.
- (v) Clamp, boss and stand.
- (vi) Stopclock, stopwatch or wall-mounted clock showing seconds. Candidates will be required to take readings at 30 s intervals. They may use their own wrist watch facility if they wish. The question will refer to a stopclock.
- (vii) Supply of hot water.
- (viii) Supply of paper towels to mop up any spillages of water.

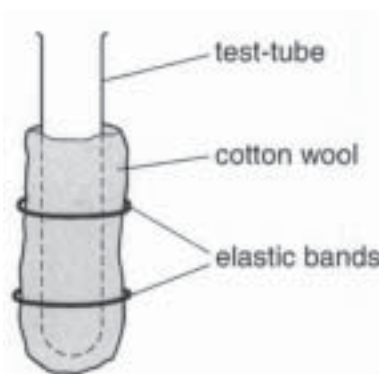


Fig. 2.1

Notes

1. The hot water is to be supplied for each candidate by the Supervisor. The water temperature should be maintained at a temperature as hot as is reasonably possible.
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 test-tube held in the clamp.
4. The candidates must be provided with the means easily and safely to pour hot water into the test-tube.
5. Candidates will be required to refill their test-tube during the experiment.

Action at changeover

Empty the test-tube. Remove the cotton wool from the tube. Supply fresh cotton wool. 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 1.5–2.0 V. 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 at three places (between the 5 cm and 10 cm marks, the 45 cm and 50 cm marks and the 85 cm and 90 cm marks). 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 end **A** of the metre rule so that connections can be made to the circuit shown in Fig. 3.1.
- (vi) Sliding contact, labelled **C**. This may be a jockey or a small screwdriver connected to a lead by means of a crocodile clip.
- (vii) 2.5 V, 0.2 A lamp in a suitable holder.
- (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.

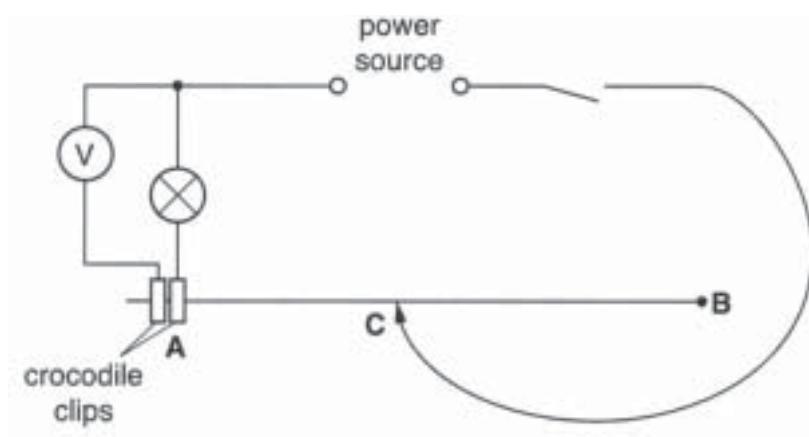


Fig. 3.1

2. As an alternative to (iv) and (v) a standard 100 cm potentiometer is acceptable.

Action at changeover

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

Question 4

No apparatus is required for this question.

This form must be completed and returned with the scripts.

REPORT ON PRACTICAL PHYSICS

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 this 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

