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**PHYSICS**

**9702/03**

Paper 3 Advanced Practical Skills

**For Examination from 2016**

SPECIMEN CONFIDENTIAL INSTRUCTIONS

**Great care should be taken to ensure that any confidential information given does not reach the candidates either directly or indirectly.**

**No access to the Question Paper is permitted in advance of the examination.**

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If you have any problems or queries regarding these Instructions, please contact CIE  
by e-mail: [info@cie.org.uk](mailto: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.

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This document consists of **6** printed pages and **2** blank pages.

## Preparing apparatus

These Instructions detail the apparatus required for the experiments in the Question Paper. It is essential that absolute confidentiality is maintained in advance of the examination: the contents of these Instructions must not be revealed either directly or indirectly to candidates.

No access is permitted to the Question Paper in advance of the examination.

If you have problems or queries regarding these Instructions, please contact CIE:

by e-mail: info@cie.org.uk,  
or by telephone: +44 1223 553554,  
or by fax: +44 1223 553558,

stating the nature of the query and quoting the syllabus and paper numbers.

It is assumed that the ordinary apparatus of a Physics laboratory will be available.

## Number of sets of apparatus

The number of sets of apparatus provided for each experiment should be  $\frac{1}{2}N$ , where  $N$  is the number of candidates taking the examination. There should, in addition, be a few spare sets of apparatus available in case problems arise during the examination.

## Organisation of the examination

Candidates should be allowed access to the apparatus for each experiment for one hour only. After spending one hour on one experiment, candidates should change over to the other experiment. The order in which a candidate attempts the two experiments is immaterial.

## Assistance to candidates

Candidates should be informed that, if they find themselves in real difficulty, they may ask the Supervisor for practical assistance, but that the extent of this assistance will be reported to the Examiner, who may make a deduction of marks.

Assistance should only be given:

when it is asked for by a candidate,  
or as directed in the Notes sections of these Instructions,  
or where apparatus is seen to have developed a fault.

Assistance should be restricted to enabling candidates to make observations and measurements. Observations and measurements must not be made for candidates, and no help should be given with data analysis or evaluation.

All assistance given to candidates must be reported on the Supervisor's Report Form.

## Faulty apparatus

In cases of faulty apparatus (not arising from a candidate's mishandling) that prevent the required measurements being taken, the Supervisor may allow extra time to give the candidate a fair opportunity to perform the experiment as if the fault had not been present. The candidate should use a spare copy of the Question Paper when the fault has been rectified or when working with a second set of apparatus.

## Supervisor's Report

The Supervisor should complete the Supervisor's Report Form on pages 7 and 8 and enclose it in the envelope containing the answers of the candidates. If more than one envelope is used, a copy of the report must be enclosed in each envelope.

**Question 1****Apparatus requirements (per set of apparatus unless otherwise specified)**

Five  $10\Omega$  carbon film resistors (e.g. RS Components product code 131-019).

Mounted 1.5V dry cell. See Note 1.

Digital ammeter with a range of at least 0 to 200 mA and reading to 1 mA or better.

Switch.

Two crocodile clips.

Four connecting wires.

Small tray to hold the resistors.

**Notes**

- 1 One of the  $10\Omega$  resistors should be placed in series with the dry cell. Candidates must not be able to make connections to the cell without including the  $10\Omega$  resistor. If necessary, candidates should be informed that the  $10\Omega$  resistor is an integral part of the power supply.
- 2 At the changeover, the apparatus should be dismantled and laid out on the bench ready for the next candidate to use. Four new  $10\Omega$  resistors should be supplied.

**Information required by Examiners**

Sample set of numerical results, clearly labelled "Supervisor's Results" and obtained out of sight of the candidates.

**Question 2****Apparatus requirements (per set of apparatus unless otherwise specified)**

Stand, boss and clamp.

90 g of ordinary table salt. See Note 1.

Three identical containers. 250 ml beakers would be suitable. See Note 2.

Funnel. See Note 3.

Access to a top-pan balance.

Stopwatch reading to 0.1 s or better.

**Note**

- 1** The salt must be dry and be composed entirely of small crystals. Salt that has added anti-caking agents has been found to be suitable. It may be necessary to stir the salt for a short time to remove any large crystals that may affect the flow rate of the salt.
- 2** One of the containers should be labelled A and have 30 g of salt placed in it. Another of the containers should be labelled B and have 60 g of salt placed in it. The third container should be empty.
- 3** The funnel should be large enough to hold 60 g of salt. The 60 g sample of salt should pass through the funnel in not less than 10 seconds.
- 4** At the changeover, the Supervisor must ensure that the mass of salt in A is 30 g, the mass of salt in B is 60 g, and the other container is empty. The apparatus should be dismantled and laid out on the bench ready for the next candidate to use.

**Information required by Examiners**

Sample set of numerical results, clearly labelled "Supervisor's Results" and obtained out of sight of the candidates.

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**This form should be completed and sent to the Examiner with the scripts.**

### **SUPERVISOR'S REPORT FORM**

#### **Specimen Paper**

The Supervisor's Report should give full details of:

- (a)** any help given to a candidate (including the nature of the help given and the name and candidate number of the candidate)
- (b)** any cases of faulty apparatus (including the nature of the problem, the action taken to rectify it, any additional time allowed, and the name and candidate number of the candidate)
- (c)** any accidents that occurred during the examination
- (d)** any other difficulties experienced by candidates, or any other information that is likely to assist the Examiner, especially if this information cannot be discovered in the scripts.

Cases of individual hardship, such as illness, bereavement or disability, should be reported direct to Cambridge on the normal Special Consideration form.

#### **Information required by Examiners**

For each question, please enclose a sample set of numerical results, obtained out of sight of the candidates and clearly labelled "Supervisor's Results".

#### **Supervisor's Report**

**Supervisor's Report (continued)**

**Declaration**

(to be signed by the Supervisor)

The preparation of this practical examination has been carried out so as to maintain fully the security of the examination.

Signed .....

Name .....

Centre number .....

Name of Centre .....