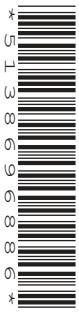
Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

PHYSICS **9702/35**

Paper 3 Advanced Practical Skills 1 **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.

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

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.

email info@cie.org.uk
phone +44 1223 553554
fax +44 1223 553558

This document consists of **7** printed pages and **1** blank page.

DC (KN/FC) 144905/2

CAMBRIDGE International Examinations

[Turn over

Preparing apparatus

These Confidential 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 Confidential Instructions must not be revealed either directly or indirectly to candidates.

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

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 Confidential 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.

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. Any action taken must be reported on the Supervisor's Report.

Supervisor's Report

The Supervisor should complete the Supervisor's Report 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)

Stand of height at least 60 cm.

Boss.

Clamp.

100 g mass hanger.

100 g slotted mass.

180° protractor with 1° divisions.

Metre rule with a millimetre scale. The mass of the metre rule should be in the range 110 g–140 g.

Three string loops each with an approximate circumference of 30 cm.

Mass. See Note 1.

Notes

1 The mass should be made from a second mass hanger. Slotted masses and modelling clay should be added to the mass hanger so that it has the **same** mass as the metre rule. Label this mass P.

2 The apparatus should be laid out on the bench. If the apparatus is to be used by another candidate, then it should be restored to its original state.

Information required by Examiners

Sample set of numerical results, clearly labelled 'Supervisor's Results' and obtained out of sight of the candidates by the Supervisor, who should be a teacher of Physics or other competent physicist.

[Turn over

Question 2

Apparatus requirements (per set of apparatus unless otherwise specified)

Stand of height at least 60 cm.

Boss.

Clamp.

Strong bar magnet with cross-section no larger than 15 mm × 15 mm.

100 g mass hanger.

Four 100 g slotted masses.

3 g of adhesive putty (e.g. Blu-Tack).

Stopwatch reading to 0.1 s or better.

Two cardboard tubes each with approximate diameter 4 cm and approximate length 10 cm. See Note 1.

200 cm length of enamelled/insulated copper wire of 20 swg or 0.9 mm diameter. See Note 1.

100 cm length of enamelled/insulated copper wire of 20 swg or 0.9 mm diameter. See Note 1.

Digital multimeter set to the range 0–200 μA reading to the nearest 0.1 μA. The range setting should be fixed and any unused terminals should be covered.

Expendable spring with approximate outside diameter 15 mm, approximate coiled length 20 mm and approximate spring constant 25 $N\,m^{-1}$ (e.g. Philip Harris product code B8G87194).

Two crocodile clips. See Note 2.

Two connecting leads.

Notes

1 Remove the enamel/insulation from the last 2 cm at the ends of each wire.

Wrap each wire around a cardboard tube and secure it with adhesive tape as shown in Fig. 2.1.

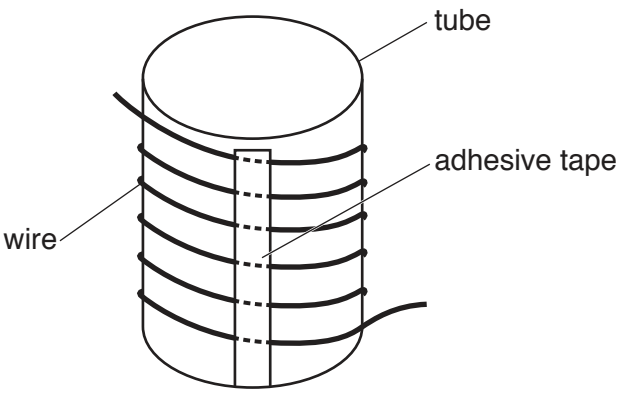


Fig. 2.1

Each wire should cover the length of its tube.

2 The jaws of the crocodile clips should be cleaned so that they make a good electrical contact with the ends of the copper wires.

3 The apparatus should be laid out on the bench. If the apparatus is to be used by another candidate, then it should be restored to its original state.

Information required by Examiners

Sample set of numerical results, clearly labelled 'Supervisor's Results' and obtained out of sight of the candidates by the Supervisor, who should be a teacher of Physics or other competent physicist.

BLANK PAGE

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

SUPERVISOR'S REPORT

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 directly 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 .....