
PHYSICS

9702/33

Paper 3 Advanced Practical Skills 1

May/June 2015

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 problems or queries regarding these Instructions, please contact Cambridge
by e-mail: 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 **7** printed pages and **1** blank page.

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.

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or by fax: +44 1223 553558,

stating the nature of the query and quoting the syllabus and paper numbers (9702/33).

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)**

Stand and boss.

30 cm ruler reading to the nearest millimetre.

Stopwatch reading to 0.1 s or better.

Six 10 g slotted masses.

Card 210 mm × 300 mm (A4 size) with mass in the range 20 g to 40 g. See Note 1.

Nail of approximate length 70 mm and approximate diameter 2.5 mm.

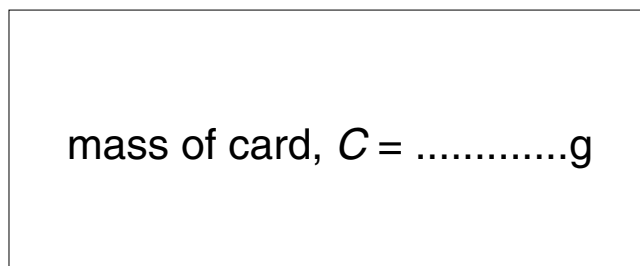
Plumb-line. See Note 2.

Lump of adhesive putty (e.g. Blu-Tack) of mass 2 g.

Small tray for the adhesive putty.

Notes

- 1 A label should be attached to the base of the stand giving the mass of the card to the nearest gram, as shown in Fig. 1.1.

**Fig. 1.1**

- 2 The plumb-line should consist of a pendulum bob supported by 40 cm of thin string with a small loop tied in the other end of the string.
- 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.
A new card and label should be provided and the adhesive putty should all be in one lump in the small tray.

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)

Small cylindrical container with a lid (e.g. plastic film canister) with approximate height 50 mm and approximate diameter 30 mm. The container must be water-tight. See Note 1.

Three identical glass marbles with diameter in the range 15 mm to 18 mm. See Note 2.

100 g slotted mass.

Large transparent glass or plastic cylinder with approximate height 30 cm and approximate diameter 10 cm. A 2 litre drinks bottle with the top cut off would be suitable. See Note 3.

Plastic tray with approximate dimensions 30 cm × 20 cm × 5 cm.

250 cm³ beaker containing 200 cm³ of water.

Stopwatch reading to 0.1 s or better.

Hook. See Note 4.

Paper towels.

Access to vernier calipers shared between at most two candidates.

Small tray for the marbles.

Notes

- 1 The small cylindrical container should have string tied around it as shown in Fig. 2.1.

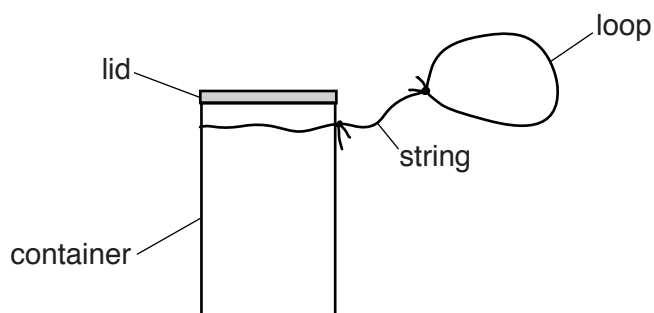


Fig. 2.1

The string must not be able to slide past the lid when the lid is on. A loop should be tied in the other end of the string.

- 2 It should be possible to close the lid of the container when there are three marbles in it.
- 3 The cylinder should be filled with water to within 1 cm of the top.

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- 4 The hook should be made from thin metal and shaped as shown in Fig. 2.2.

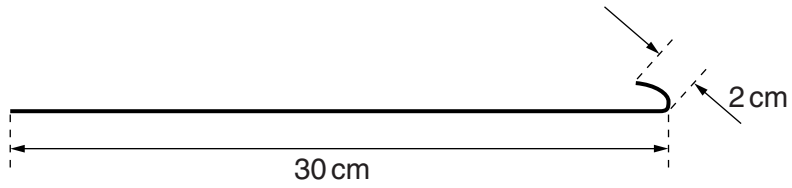


Fig. 2.2

- 5 The apparatus should be laid out on the bench. If it is to be used by a second 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.

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

SUPERVISOR'S REPORT FORM

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

