



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

PHYSICS

9702/33

Paper 3 Advanced Practical Skills 1

October/November 2012

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 CIE
by e-mail: international@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.



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.

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by e-mail: international@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 (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)**

Optical pin.

Two pieces of card $28\text{ cm} \times 4\text{ cm}$ with minimum thickness 1.3 mm . Card taken from the back of A4 pads would be suitable. See Note 1.

Scissors.

Metre rule with a millimetre scale.

Stand.

Boss.

Clamp.

Split cork/rubber bung (to grip the optical pin).

Stopwatch reading to 0.1 s or better.

Notes

- 1 The two pieces of card should be joined using adhesive tape (Sellotape), as shown in Fig. 1.1.

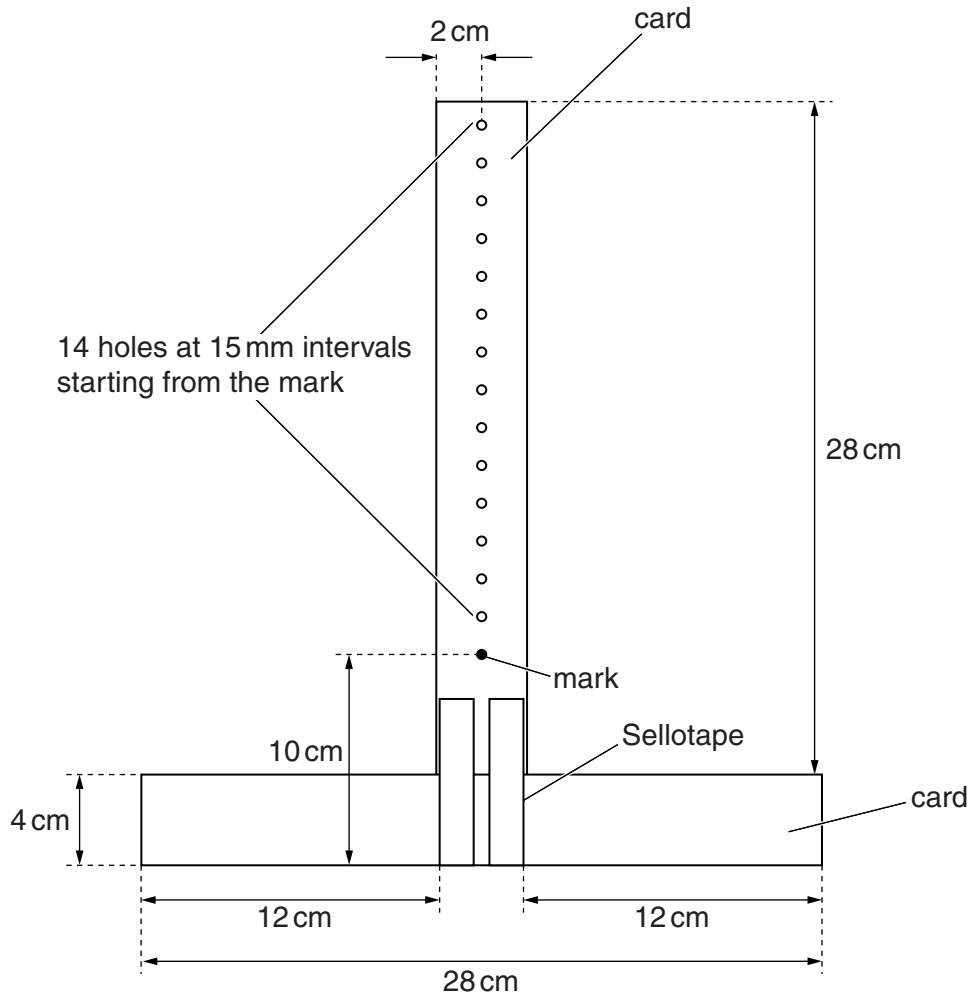


Fig. 1.1

One piece of card should have a mark and holes centrally placed as shown in Fig. 1.1. The Sellotape should not cover the mark or any of the holes. The holes should be large enough for the card to swing freely from the optical pin.

- 2 The apparatus should be laid out on the bench and, if it is to be used by another candidate, then it should be restored to its original state. A new card shape should be provided.

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)**

Model truck or car. See Note 1 and Note 2.

Board of approximate dimensions 500 mm × 120 mm × 12 mm. See Note 3.

Wooden block. See Note 4.

180° protractor with 1° divisions.

100 g slotted mass.

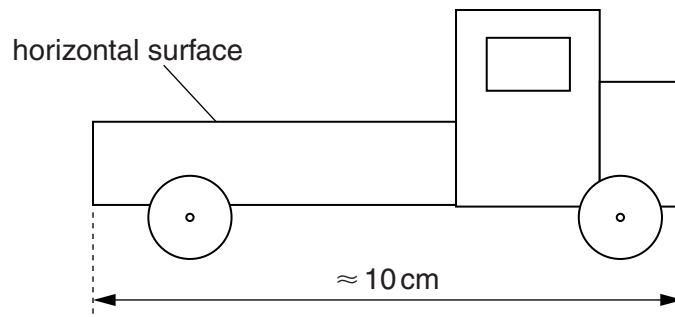
Approximately 0.5 g of Blu-Tack.

Metre rule with a millimetre scale.

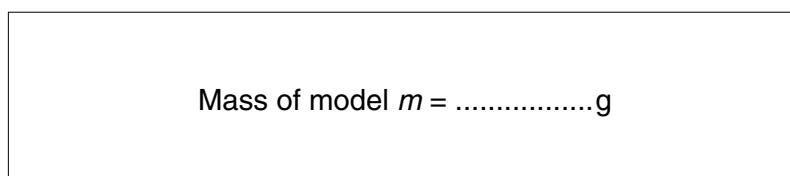
Stopwatch reading to 0.1 s or better.

Notes

- 1 The model truck or car should be of length approximately 10 cm and mass 80 g–100 g and have free-running wheels. It should have a flat horizontal surface as shown in Fig. 2.1. It should be possible to rest the 100 g mass on the horizontal surface.

**Fig. 2.1**

- 2 The value of the mass of the truck or car should be written on a card as shown in Fig. 2.2 and given to the nearest gram.

**Fig. 2.2**

- 3 The size of the board is not critical.

A straight line should be drawn on the board 40 cm from one end, as shown in Fig. 2.3.

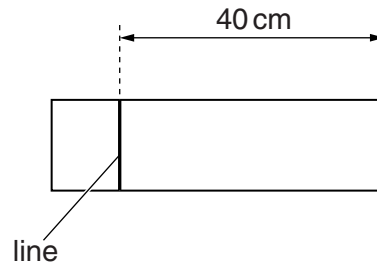


Fig. 2.3

- 4 The block should be used to support one end of the board.

It will be necessary for the candidate to set up the board so that, when the truck is placed on the line and then released, it travels a distance of 40 cm down the slope and approximately 60 cm along the horizontal bench, after leaving the board, before stopping.

The block should be of a suitable size to achieve this.

- 5 The apparatus should be laid out on the bench and, if it 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.

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

SUPERVISOR'S REPORT FORM

General Certificate of Education Advanced Subsidiary Level and Advanced Level

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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 CIE 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

