



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

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**PHYSICS**

**9702/34**

Advanced Practical Skills 2

**May/June 2011**

**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: [international@cie.org.uk](mailto: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.

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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.

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

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 (9702/34).

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)**

Mass hanger with a mass of 50g, clearly labelled 'mass = 50g'.

Slotted masses (two 50g and three 20g), suitable for the mass hanger and with the mass values clearly visible. See Note 1.

Two set squares.

Metre rule with a millimetre scale.

Tall 500 ml beaker (glass or rigid plastic) with parallel sides and an external diameter in the range 7 cm to 9 cm. See Note 2.

Two 100 g slotted masses. See Note 3.

Thin string of length 25 cm. See Note 4.

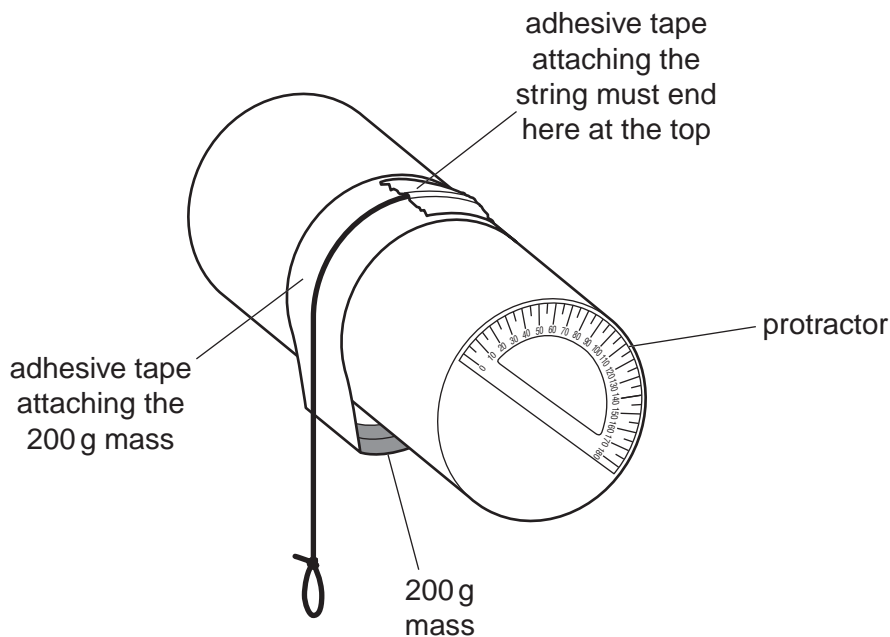
Paper 180° protractor with diameter slightly less than the diameter of the beaker. A clear photocopy or scanned copy of a protractor is suitable, with its size reduced to suit the beaker. See Note 5.

Two wood strips about 30 cm by 2.5 cm by 2.5 cm and two shorter strips of wood. See Note 6.

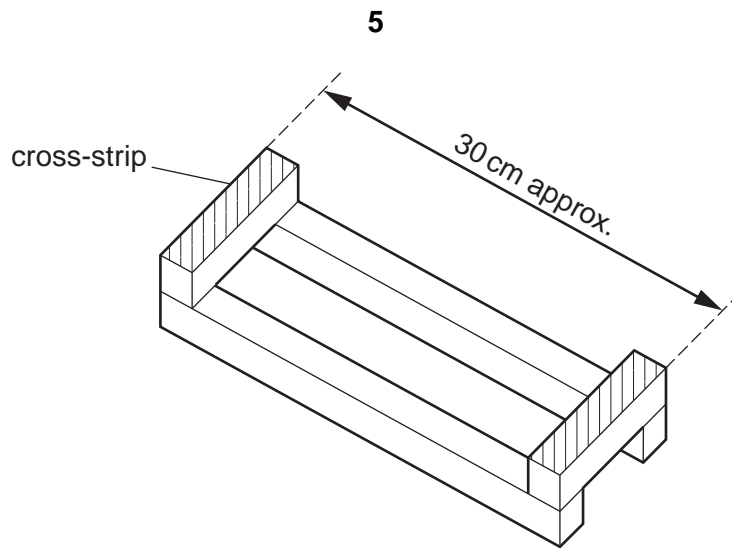
Two identical, flat-topped stable supports about 30 cm high (e.g. two piles of bricks or two box files). See Note 7.

## Notes

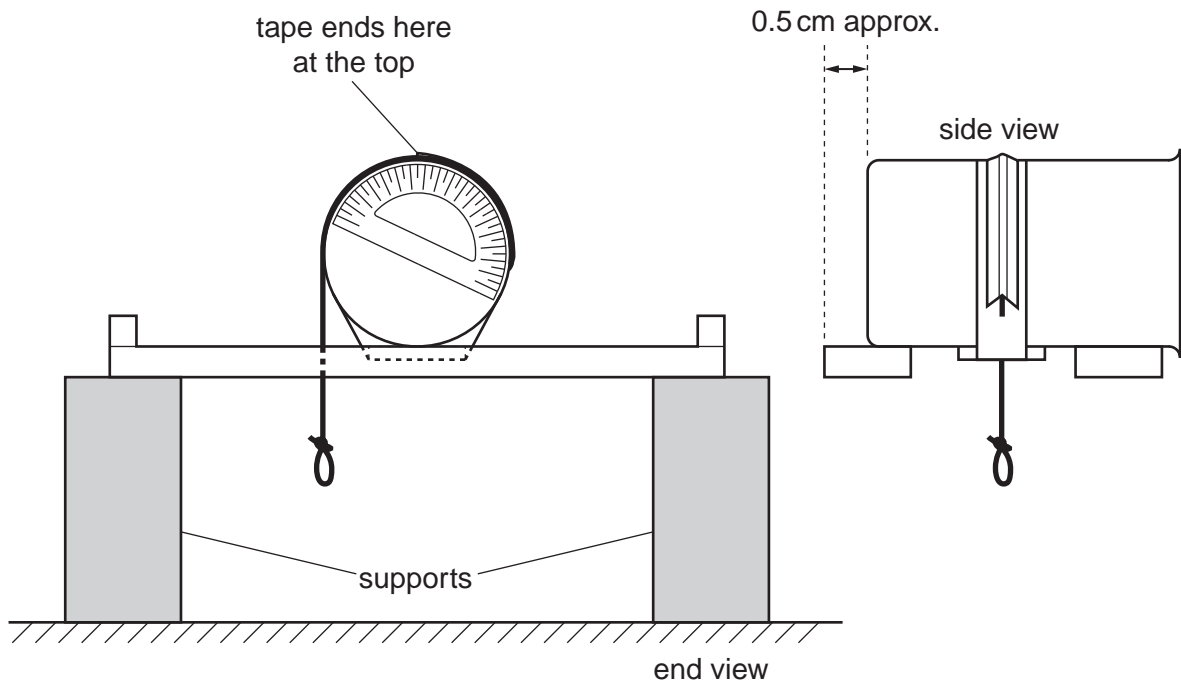
- 1 If three 20 g masses are not available, six 10 g masses may be used. The 10 g masses should be attached in pairs with tape so that three masses of 20 g each are available to the candidate.
- 2 If a 500 ml beaker is not available, then any cylindrical, rigid container with diameter between 7 cm and 9 cm would be suitable (e.g. an empty glass bottle or metal can).
- 3 Attach the two 100 g slotted masses to the beaker using adhesive tape, as shown in Fig. 1.1.
- 4 Tie a loop in one end of the string and then attach the string to the beaker using adhesive tape, as shown in Fig. 1.1.
- 5 Stick the paper protractor to the base of the beaker using paper adhesive (e.g. Pritt Stick), as shown in Fig. 1.1. The  $0^\circ$  mark on the protractor should be beyond the end of the adhesive tape, as shown in Fig. 1.1, but the exact position is unimportant.
- 6 The wood strips should be fixed parallel to each other using two cross-strips, as shown in Fig. 1.2. Their spacing should be suitable for the apparatus arrangement shown in Fig.1.3, with a gap greater than the diameter of the attached masses.
- 7 The apparatus should be arranged as shown in Fig. 1.3, and returned to this state if it is to be used by another candidate.



**Fig. 1.1**



**Fig. 1.2**



**Fig. 1.3**

**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)**

Retort stand, boss and clamp.

Mass hanger of mass 100 g, with the mass of the hanger clearly indicated.

One 100 g slotted mass suitable for the 100 g mass hanger.

Mass hanger of mass 50 g, with the mass of the hanger clearly indicated.

Rubber band of unstretched circumference approximately 20 cm, and maximum width 6 mm.

Stopwatch reading to 0.1 s or better.

30 cm rule with a millimetre scale.

**Notes**

- 1 The apparatus should be laid out on the bench, and returned to this state if it is to be used by another candidate.

**Information required by Examiners**

Diameter of the 100 g mass hanger at its widest point.

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

#### May/June Session 2011

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 Question 2, diameter of the 100g mass hanger at its widest point:

diameter = ..... cm

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 .....

