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

PHYSICS **9702/31**

Paper 31 Advanced Practical Skills 1 **October/November 2009**

CONFIDENTIAL INSTRUCTIONS

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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 **6** printed pages and **2** blank pages.

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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 (9702/31).

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.

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Question 1

Apparatus requirements (per set of apparatus unless otherwise specified)

Round wooden rod between 20 mm and 25 mm in diameter and 20 cm in length (e.g. a section of broom handle). Ends should be cut squarely.

Screw hook – see Note 1.

50 g laboratory mass – see Note 1.

Five expendable springs (Philip Harris catalogue number B8A41397) – see Note 2.

Tall 1 litre transparent beaker (or similar transparent container about 20 cm tall and 8 cm diameter).

Beaker (or similar container) containing about 1 litre of water.

Tall retort stand (at least 0.7 m high).

Boss and clamp.

Half-metre rule, with a millimetre scale.

Stopwatch reading to 0.1 s or better.

Vernier calipers (these can be shared between two or three candidates).

Paper towels.

Notes

1 The screw hook should be screwed centrally into one end of the wooden rod. The 50 g mass should be attached centrally to the other end of the wooden rod, as shown in Fig. 1.1.

2 The five springs should be linked together in series (end to end), as shown in Fig 1.2.

3 If the apparatus is to be used by a second candidate, all the equipment should be dismantled and returned to its original state.

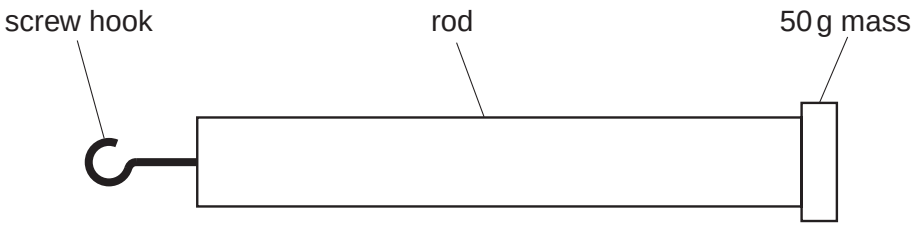

Fig. 1.1

Fig. 1.2

Information required by Examiners

Sample set of numerical results, clearly marked “Supervisor’s Results”.

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Question 2

Apparatus requirements (per set of apparatus unless otherwise specified)

Table-tennis (ping-pong) ball.

75 cm of thin thread – see Note 1.

Glass marble about 1.5 cm in diameter.

Plastic tube about 30 cm long and with internal diameter of about 3 cm (e.g. plastic waste pipe).

Stand, two bosses and two clamps.

Two wooden blocks each about 3 cm by 3 cm by 1.5 cm.

Half-metre rule, with a millimetre scale.

Metre rule, with a millimetre scale.

Large set square.

Brick with at least one flat surface at least 10 cm long.

Small plastic beaker.

Protractor.

Notes

1 One end of the thread should be glued to the table-tennis ball.

2 If the apparatus is to be used by a second candidate, it should be dismantled.

Information required by Examiners

Sample set of numerical results, clearly marked “Supervisor’s Results”.

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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

October/November Session 2009

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

Question 1: Sample set of numerical results, clearly marked "Supervisor's Results".

Question 2: Sample set of numerical results, clearly marked "Supervisor's Results".

Supervisor's Report

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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 .....

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