



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

PHYSICS

9702/31

Paper 31 Advanced Practical Skills 1

May/June 2007

CONFIDENTIAL INSTRUCTIONS

2 hours

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.



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

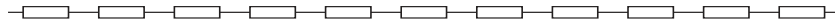
In cases of faulty apparatus (not arising from a candidate's mishandling) that prevent the required measurements being taken, the Supervisor may allow extra time to give the candidate a fair opportunity to perform the experiment as if the fault had not been present. The candidate should use a spare copy 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.

Question 1**Apparatus requirements (per set of apparatus unless otherwise specified)**

Eleven 100Ω carbon film resistors. The resistors should be soldered together to form a chain as shown in Fig. 1.1.

**Fig. 1.1**

Three 1.5V dry cells connected in series to form a battery. Candidates must be able to make connections to this battery without difficulty.

Mounted 470Ω carbon film resistor. The resistor should be labelled R_2 . The value of the resistance of the resistor (i.e. the colour coding) should be hidden from candidates. Candidates must be able to make connections to this resistor without difficulty.

Digital voltmeter. The meter must be capable of measuring voltages in the range 0 – 5V to a precision of 0.01V.

Milliammeter. Digital or analogue would be suitable. The meter must be capable of measuring currents in the range 0 – 100mA to a precision of 1 mA.

Two crocodile clips.

Seven connecting wires.

Notes

- 1 At the beginning of the experiment, Supervisors must be particularly vigilant to ensure that candidates have connected the circuit correctly. The extent of any help given to candidates must be detailed in the Supervisor's Report and sent with the scripts.
- 2 If the apparatus is to be used by a second candidate, it should be dismantled at the end of the first candidate's experiment and the equipment laid out on the bench ready for the next candidate to use.

Information required by Examiners

None.

Question 2**Apparatus requirements (per set of apparatus unless otherwise specified)**

One stand, two bosses and two clamps.

Metre rule.

Small metal ball with a small hook attached. Pendulum bobs have been found to be suitable.

Piece of rubber of unstretched length in the range 20 cm to 40 cm (one per candidate). A new rubber band of maximum width 3 mm cut into a single strip has been found to be suitable. The exact dimensions and type of rubber are not critical.

Piece of thin string of length 60 cm.

Stopwatch reading to 0.1 s or better.

Two small blocks of wood (e.g. about 3 cm x 3 cm x 1 cm). The exact dimensions are not critical.

Note

If the apparatus is to be used by a second candidate then the apparatus should be dismantled and laid out on the bench ready for the next candidate to use. A fresh piece of rubber should be supplied.

Information required by Examiners

None.

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

SUPERVISOR'S REPORT FORM

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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

Question 1: none.

Question 2: none.

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

