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

PHYSICS **9702/03**

Paper 3 Practical Test

October/November 2006

1 hour 15 minutes

CONFIDENTIAL INSTRUCTIONS

Great care should be taken to ensure that any confidential information given does not reach the candidates either directly or indirectly.

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.

Instructions for preparing apparatus

These instructions detail the apparatus required for the experiment in this paper. No access is permitted to the Question Paper in advance of the examination session.

It is assumed that the ordinary apparatus of a Physics laboratory will be available.

Instructions for the Practical Physics Supervisor

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.

The Supervisor should complete the report form on pages 7 and 8 and enclose it in the envelope containing the answers of the candidates. A note of any help given to, or any particular difficulties experienced by, a candidate should also be enclosed, especially if the Examiner would be unable to discover these from the written answers.

It is assumed that candidates will provide themselves with such standard items as a 30 cm rule, a pair of compasses, a 0° to 180° protractor, a set square and a calculator.

Squared paper should be available.

Whenever a stopwatch or stopclock is specified, candidates should be advised, in advance, that they may, if they wish, use quartz wristwatches with stopwatch facilities.

Question 1

Apparatus requirements (per candidate)

Two magnadur (ceramic) magnets attached to a U-shaped piece of soft iron. These can be obtained from motor construction kits or ordered from Griffin Education (catalogue numbers XJP-341-E and XKB-350-190J). The magnets must be mounted on the U-shaped piece of iron so that the facing pole pieces are of opposite polarity. The separation of the pole pieces should be about 4 cm.

30 cm rule with a millimetre scale.

50 g mass holder and five slotted 50 g masses. See note 1.

Metre rule.

1.2 m length of 32 swg (diameter about 0.28 mm) **bare** copper wire. Candidates will make electrical connections to this wire, and therefore it is important that Centres do **not** use lacquered wire.

Stand, two bosses and two clamps.

G-clamp to be used to clamp the base of the stand to the bench.

Two small blocks of wood. The blocks will be used to grip the copper wire in the clamp.

Two crocodile clips.

a.c. power supply. The output of the supply must be set to give a current of at least 1 A through the copper wire. See notes 3 and 4.

Card, on which is written 'f = 50 Hz'. If the frequency of the mains supply is not 50 Hz, then the appropriate value should be written on the card.

Two connecting leads each about 1 m in length. At least one connecting lead should terminate in a 4 mm plug. Candidates must be able to connect the leads to the power supply and the crocodile clips without difficulty.

Notes

1 If sufficient 50 g masses are not available, then a 100 g mass holder, two 100 g slotted masses and a 50 g mass should be provided. Candidates must be able to add and remove masses from the holder without difficulty.

2 A 150 g mass should be firmly attached to one end of the copper wire. The other end of the wire should be placed between the blocks of wood and clamped so that the wire hangs over the edge of the bench as shown in Fig. 1.1.

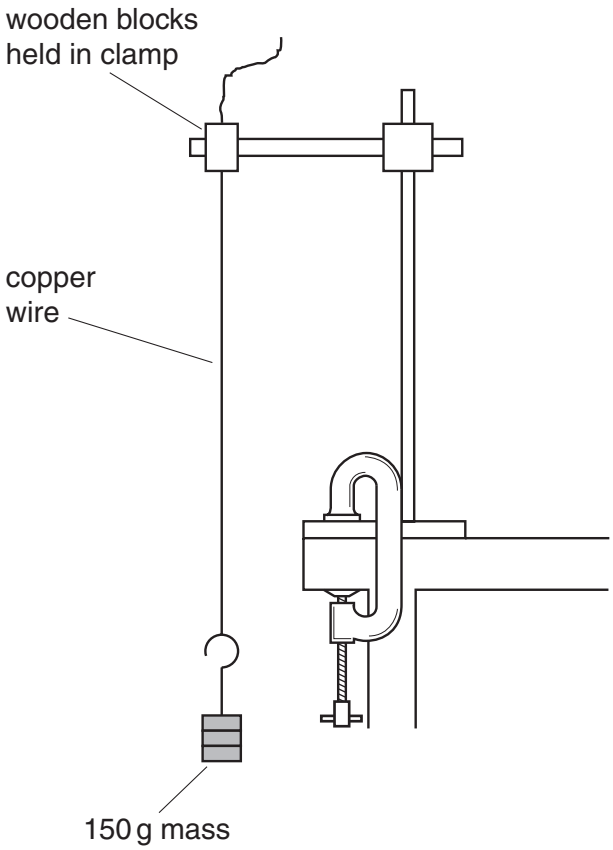

Fig. 1.1

3 If the power supply has output terminals other than a.c., then these should be covered with tape so that candidates are unable to make connections to them. Candidates must not be able to adjust the output voltage of the supply.

4 If there are insufficient power supply units, a single power supply may be used to serve several candidates by means of parallel connections. The connections must be made by the Supervisor so that each candidate has their own pair of terminals labelled 'a.c. power supply'. If this is done, care must be taken that an excessive current is not drawn from the supply.

5 If the apparatus is to be used by a second candidate, then it should be restored to its original condition.

Information required by the Examiners

Mass per unit length of wire supplied.

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

REPORT ON PRACTICAL PHYSICS

General Certificate of Education Advanced Subsidiary Level and Advanced Level

October/November Session 2006

General

The Supervisor is invited to give details, on the reverse of this form, of any difficulties experienced by particular candidates, giving names and candidate numbers. These should include reference to:

(a) accidents to apparatus or materials;

(b) any other information that is likely to assist the Examiner, especially if this cannot be discovered in the scripts;

(c) any help given to a candidate.

Other cases of individual hardship, e.g. illness, disability, should be reported direct to CIE on the normal 'Special Consideration Form'.

In cases of faulty apparatus (not arising from a candidate's mishandling) which prevent the required readings being taken, the following action is permissible.

The Invigilator – in consultation with the Physics teacher responsible for preparing the examination – 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. The Invigilator is asked to provide CIE with details of such cases of time compensation (a copy being enclosed with the scripts), especially

(i) the candidate's name and candidate number,

(ii) the extra time allowed,

(iii) notes on the nature of the fault, the action taken to rectify the difficulty and any other comments that would be helpful to the Examiner in making a fair assessment of the candidate's work during the practical examination.

Information required

Mass per unit length of wire supplied = ……

A list, by name and candidate number, of candidates requiring help, with details of help provided.

Declaration (to be signed by the Principal)

The preparation of this practical examination has been carried out so as to maintain fully the security of the examination.

Signed .....

Centre Number .....

Name of Centre .....