

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**General Certificate of Education Advanced Subsidiary Level  
and Advanced Level**

**PHYSICS**

**9702/3**

**PAPER 3 AS Practical**

**INSTRUCTIONS**

**OCTOBER/NOVEMBER SESSION 2002**

1 hour 15 minutes

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

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**These instructions consist of 7 printed pages and 1 blank page.**



**Instructions for preparing apparatus**

These instructions detail the apparatus required for the experiment in this paper. A summary of the questions that will be presented to the candidates is included, to allow the Physics teacher to test the apparatus appropriately. 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  $0^\circ$  to  $180^\circ$  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.

**Instructions to Supervisors****Apparatus requirements per candidate**

2 bar magnets (e.g. Philip Harris catalogue number A46978 or Griffin & George catalogue number XJP-380-030T)

Cradle to support one of the bar magnets. Bent copper wire has been found to be suitable.

Approximately 60 cm of cotton or thin twine

Stand, boss and clamp

Two small blocks of wood (to be used to grip the cotton)

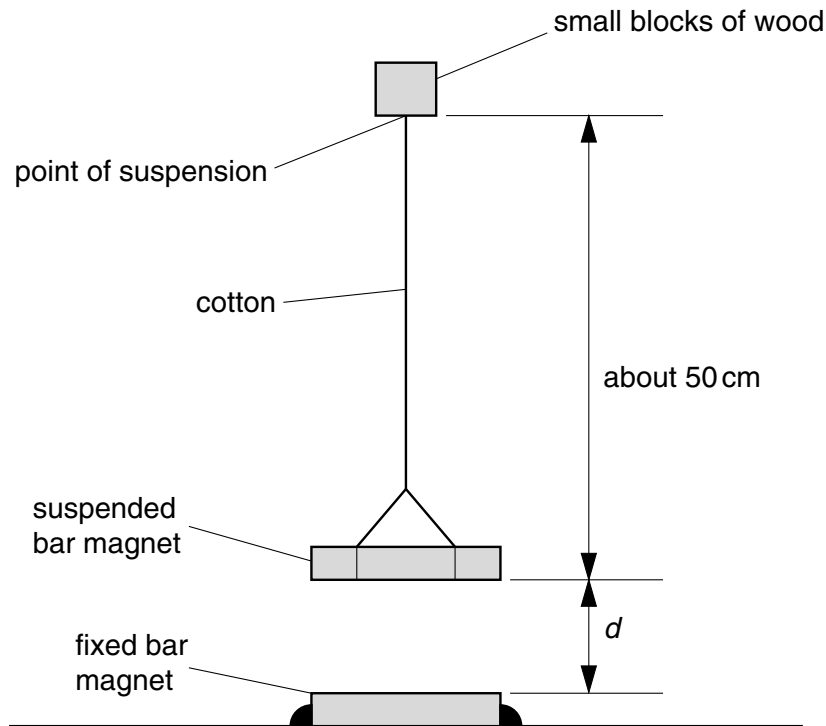
Blu-tack or plastic tape (to be used to attach one of the magnets to the workbench)

50 cm rule

Stopwatch reading to 0.1 s or better

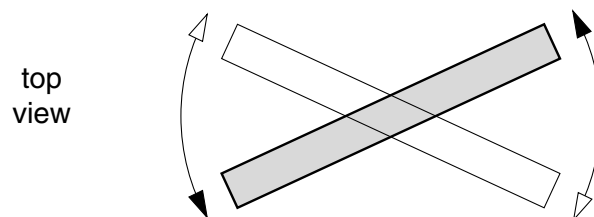
### Procedure to be followed by candidates

Candidates will clamp the thread using the blocks of wood and suspend one of the magnets horizontally using the cradle. The other magnet is to be fixed to the workbench. The initial separation of the magnets should be about 5 cm. The arrangement is shown in Fig. 1.1.



**Fig. 1.1**

Candidates will be required to measure the period  $T$  of small torsional oscillations of the suspended magnet (as shown in Fig. 1.2) as the distance  $d$  between the magnets is changed.



**Fig. 1.2**

Values of  $d$  should be in the range from 3 cm to 10 cm. A graph of  $T$  against  $d$  should produce a straight line with a  $y$ -intercept which is small or zero.

At the start of the experiment, Supervisors must be particularly vigilant to ensure that candidates are using the suspended bar magnet in the correct oscillatory mode. Candidates who have to be shown which mode to use will not be penalised.

**Information required by Examiners**

None.

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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 2002**

**General**

The Supervisor is invited to give details, on the reverse of this form, of any difficulties experienced by particular candidates, giving names and index 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 of performing 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 index 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 which would be helpful to the Examiner in making a fair assessment of the candidate's work during the practical examination.



**Information required**

A list, by name and index 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 .....

