

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Advanced Level

PHYSICS

9702/05

Paper 5 Practical Test

CONFIDENTIAL INSTRUCTIONS

October/November 2006

1 hour 30 minutes

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 7 printed pages and 1 blank page.



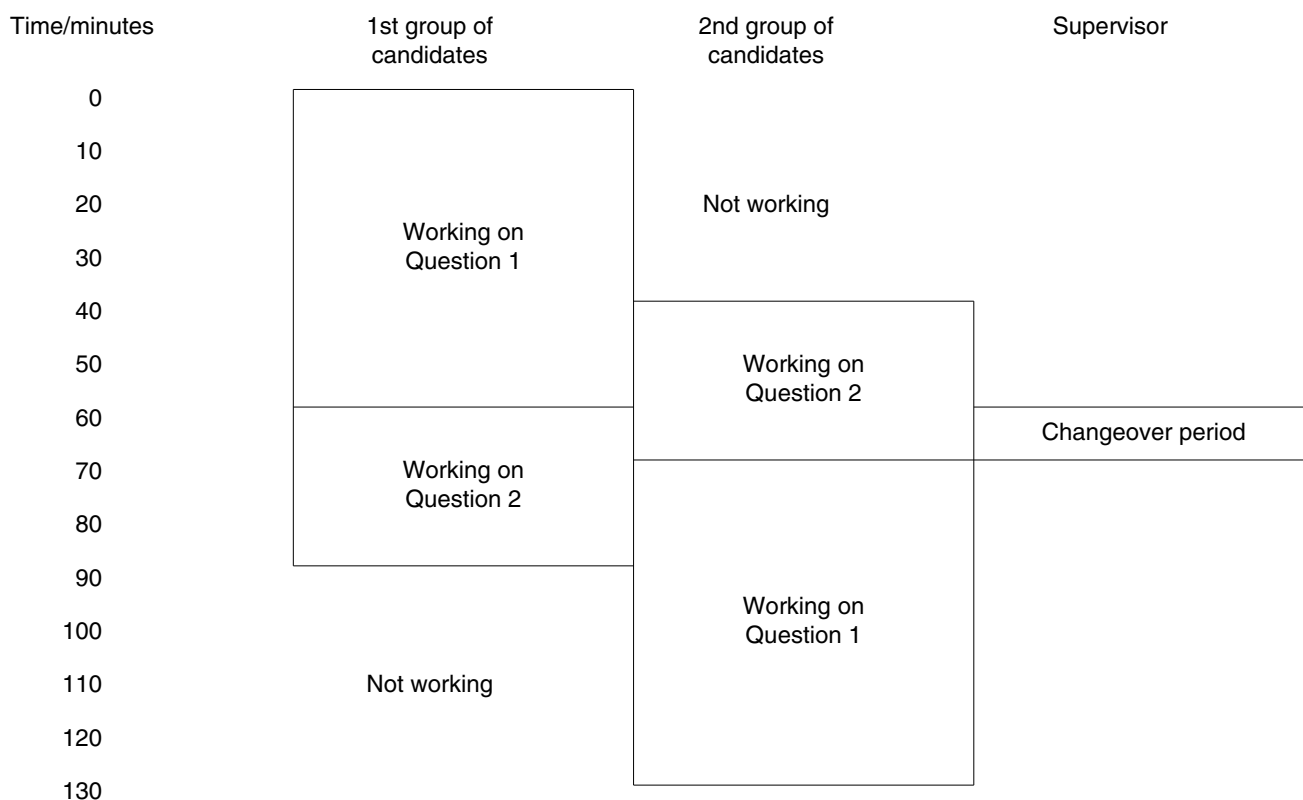
Instructions for preparing apparatus

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.

Number of sets of apparatus

In addition to a few spare sets, there should ideally be one set of apparatus per candidate.

If this is not possible, then the minimum number of sets of apparatus to be provided should be sufficient for half the candidates to carry out the experiment simultaneously, plus a few spare sets. With this number of sets available, a staggered start to the examination will be required, which may be organised as shown in the diagram below.



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 standard items such 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 set unless otherwise specified)

60 W pearl lamp, with power supply, mounted approximately 20 cm above the bench. Lamps used for microscope work in Biology have been found to be suitable. Clear lamps are not suitable for this experiment.

Half-metre rule.

Small pin. Dressmaking pins have been found to be suitable. These pins have a diameter of approximately 0.65 mm. The point of the pin must be sharp. Optics pins are **not** suitable for this experiment.

Stand, boss and clamp.

Micrometer screw gauge. If there are insufficient micrometers for candidates to have one each then Supervisors must ensure that each candidate has reasonable access to a micrometer.

15 cm or 30 cm rule.

Two crocodile clips.

Light-dependent resistor (LDR) (e.g. RS components catalogue reference 651-507), **one per candidate**. The resistance of this light-dependent resistor should vary from about a few hundred ohms in bright light conditions to several million ohms in dark conditions. The LDR should be placed in a black card tube with a piece of Blu-Tack at the bottom of the tube to prevent light entering from below. The card must be thick enough so that light cannot penetrate the sides. The length of the tube is not critical, but should be around 3 cm or 4 cm. The metal connecting pins from the LDR should protrude from the bottom of the tube (through the Blu-Tack) so that candidates may make connections to the pins using the crocodile clips. A piece of aluminium foil must be folded on to the top of the tube and pressed against the sides of the tube so that the tube is light-tight. It will be necessary to wrap a small length of Sellotape around the side of the tube and the aluminium foil to secure the foil. Spare tubes containing LDRs should be available. The tube is shown in Fig. 1.1.

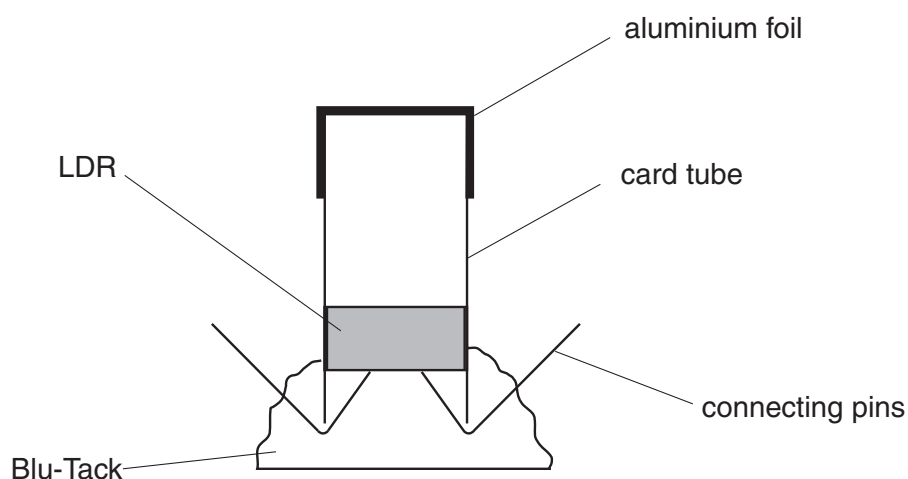


Fig. 1.1

Low voltage power supply unit with a d.c. output of about 4 V or 5 V (e.g. three mounted dry cells in series).

1 k Ω carbon film resistor. The resistor should be mounted so that candidates may make connections to it using 4 mm plugs.

Milliammeter, range 0 – 1 mA or 0 – 2 mA. Supervisors must ensure that the readings from the meter can be taken to at least two significant figures. A digital meter is most suitable.

Voltmeter, 0 – 5 V or 0 – 6 V range.

Six stackable connecting wires.

Notes

1. Before the start of the experiment, Supervisors should attach the tube in an upright position to the surface of the bench using the Blu-Tack. The pearl lamp should be mounted vertically above the aluminium foil at the top of the tube. The lamp should be switched on just before the start of the experiment. See Fig. 1.2.

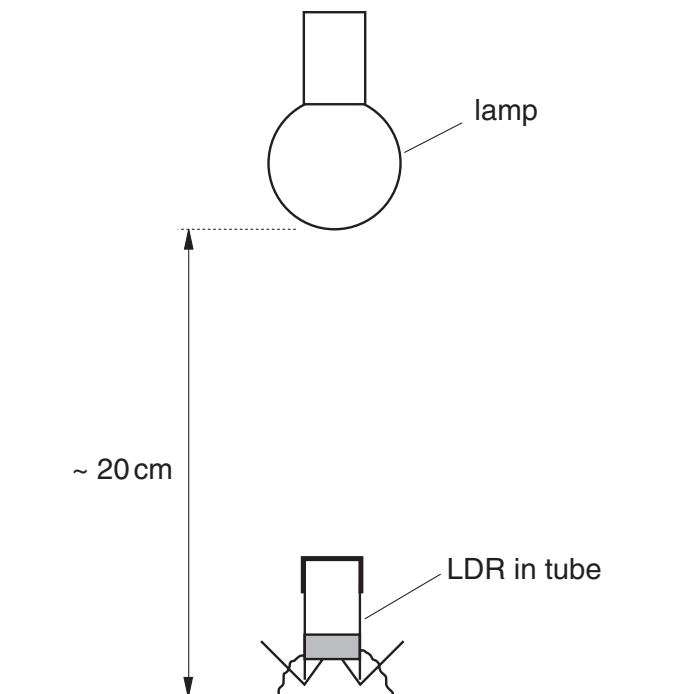


Fig. 1.2

2. Supervisors should remind candidates at the start of the experiment that the lamps will become hot and therefore must not be touched.
3. If the apparatus is to be used by a second candidate, the circuit 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. A fresh tube containing an LDR as shown in Fig. 1.1 should be supplied and fixed to the bench as shown in Fig. 1.2.

Information required by Examiners

Diameter of pin supplied to candidates.

Question 2

Question 2 is a design exercise that does not require apparatus.

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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 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 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 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

Diameter of pin supplied to candidates = mm

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

