



# Cambridge O Level

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**PHYSICS**

**5054/03**

Paper 3 Practical Test

**For examination from 2023**

SPECIMEN CONFIDENTIAL INSTRUCTIONS



**This document gives details of how to prepare for and administer the practical exam.**

**The information in this document and the identity of any materials supplied by Cambridge International are confidential and must NOT reach candidates either directly or indirectly.**

**The supervisor must complete the report at the end of this document and return it with the scripts.**

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## **INSTRUCTIONS**

- If you have any queries regarding these confidential instructions, contact Cambridge International stating the centre number, the syllabus and component number and the nature of the query.  
email [info@cambridgeinternational.org](mailto:info@cambridgeinternational.org)  
phone +44 1223 553554

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This document has **8** pages.

## General information about practical exams

Centres must follow the guidance on science practical exams given in the *Cambridge Handbook*.

### Safety

Supervisors must follow national and local regulations relating to safety and first aid.

Only those procedures described in the question paper should be attempted.

Supervisors must inform candidates that materials and apparatus used in the exam should be treated with caution. Suitable eye protection should be used where necessary.

The following hazard codes are used in these confidential instructions, where relevant:

<b>C</b>	corrosive	<b>MH</b>	moderate hazard
<b>HH</b>	health hazard	<b>T</b>	acutely toxic
<b>F</b>	flammable	<b>O</b>	oxidising
<b>N</b>	hazardous to the aquatic environment		

Hazard data sheets relating to substances used in this exam should be available from your chemical supplier.

### Before the exam

- The packets containing the question papers must **not** be opened before the exam.
- It is assumed that standard school laboratory facilities, as indicated in the *Guide to Planning Practical Science*, will be available.
- Spare materials and apparatus for the tasks set must be available for candidates, if required.

### During the exam

- It must be made clear to candidates at the start of the exam that they may request spare materials and apparatus for the tasks set.
- Where specified, the supervisor **must** perform the experiments and record the results as instructed. This must be done **out of sight** of the candidates, using the same materials and apparatus as the candidates.
- Any assistance provided to candidates must be recorded in the supervisor's report.
- If any materials or apparatus need to be replaced, for example, in the event of breakage or loss, this must be recorded in the supervisor's report.

### After the exam

- The supervisor must complete a report for each practical session held and each laboratory used.
- Each packet of scripts returned to Cambridge International must contain the following items:
  - the scripts of the candidates specified on the bar code label provided
  - the supervisor's results relevant to these candidates
  - the supervisor's reports relevant to these candidates
  - seating plans for each practical session, referring to each candidate by candidate number
  - the attendance register.

## Specific information for this practical exam

During the exam, the supervisor (**not** the invigilator) must do the experiments in Questions 1, 2 and 3 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

### Question 1

Items to be supplied by the centre (per set of apparatus, unless otherwise specified):

- power supply (see Note 1)
- switch or plug key
- light-dependent resistor (see Note 2)
- resistor of resistance  $4.7\text{ k}\Omega$
- voltmeter (range  $0\text{--}6\text{ V}$ )
- connecting leads (see Note 3)
- $250\text{ cm}^3$  glass beaker containing  $150\text{ cm}^3$  water
- adhesive putty
- light source (see Note 4)
- container holding approximately  $30\text{ cm}^3$  of cloudy non-transparent liquid (see Note 5)
- $5\text{ cm}^3$  plastic syringe, graduated with  $1\text{ cm}^3$  divisions
- stirrer (e.g. a glass rod or wooden splint)
- paper towels or cloths to clean up spillages.

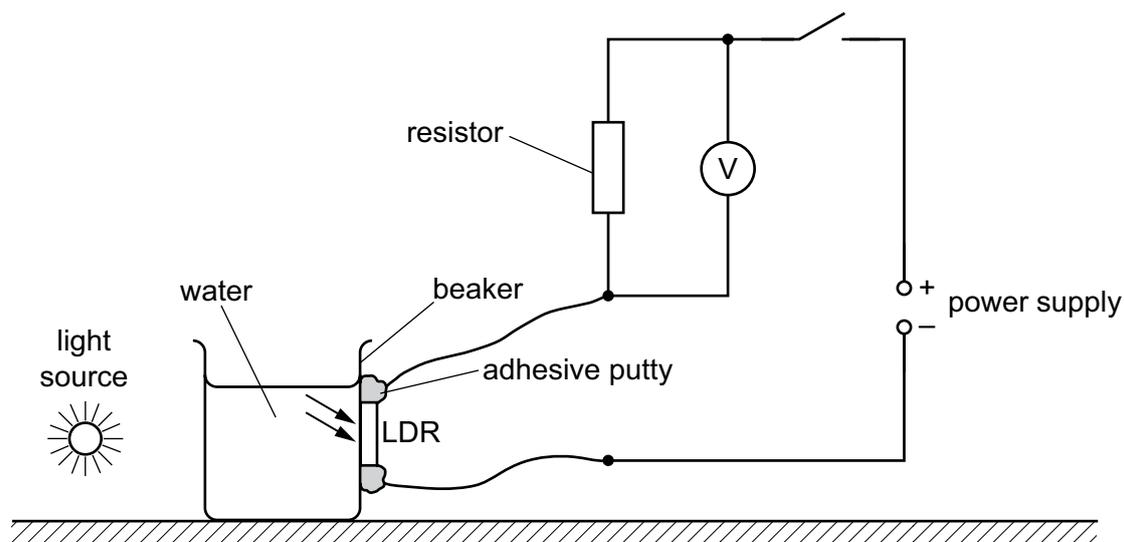


Fig. 1.1

### Notes

- 1 The following are suitable power sources:
  - three  $1.5\text{ V}$  dry cells in suitable holders connected in series
  - four  $1.2\text{ V}$  rechargeable cells in suitable holders connected in series
  - d.c. power supply of  $4.5\text{ V}$ . Where candidates are provided with a power supply with a variable output p.d., the p.d. must be set by the supervisor and fixed (e.g. taped).
- 2 The LDR should have resistance in the range  $5\text{ k}\Omega$  to  $1\text{ M}\Omega$  (light to dark), with a voltage range operating up to  $250\text{ V}$ . A suitable LDR is the Silonex NORPS-12. The RS component code is RS 914-6714.
- 3 The supervisor should assemble the circuit and other apparatus as shown in Fig. 1.1.

- 4 The light source should be a small torch lamp of approximate diameter 1 cm, 2.5 V, 250 mA, filament indicator lamp, clear, e.g. RS 106-313 placed in a suitable holder, e.g. RS 171-2603, attached to a suitable power supply and fixed to the bench with a small piece of adhesive putty so that it does not slide around.
- 5 Milk is suitable provided it has not soured or coagulated. Coconut milk or other vegetable milks may be suitable. If either liquid milk or a dilute solution of powdered milk is used, the consistency must be sufficient so that when  $10\text{ cm}^3$  of the solution is added to the  $150\text{ cm}^3$  of water in the beaker, there is a change in the reading on the voltmeter of at least 1.5 V.

### **Action at changeover**

The supervisor must ensure that the apparatus is in the configuration shown in Fig. 1.1 with only  $150\text{ cm}^3$  of fresh water in the beaker and the light source switched off.

The investigation must be carried out in a darkened area of the laboratory.

### **Information required by Examiners**

Sample set of numerical results, clearly marked 'supervisor's results', obtained out of sight of the candidates.

## Question 2

Items to be supplied by the centre (per set of apparatus, unless otherwise specified):

- lamp and suitable power supply (see Note 1)
- two identical biconvex lenses with 15 cm focal lengths (see Note 2)
- stand, two clamps and two bosses
- metre rule
- 3 mm diameter ball of adhesive putty
- weight, such as a heavy mass or brick
- sheet of 2 mm graph paper to place on the bench underneath the lamp.

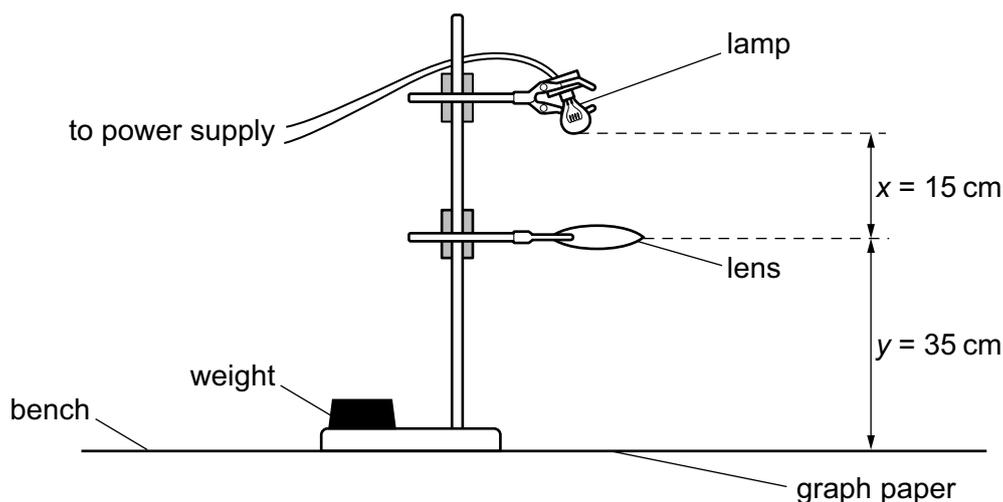


Fig. 2.1

### Notes

- 1 The lamp should be a small torch lamp of approximate diameter 1 cm, 2.5 V, 250 mA, filament indicator lamp, clear, e.g. RS 106-313. It must be placed in a small holder, e.g. RS 171-2603 so that it can be held by the clamp. The clamp should be fastened to the stand so that the lamp is a distance of approximately 50 cm above the bench, as shown in Fig. 2.1. The distance  $y$  between the bench and the centre of the lens must be 35 cm. The lamp must be connected to a suitable power supply. The apparatus should be set up in a darkened part of the laboratory.
- 2 The second lens must be placed on the bench near the apparatus and clearly labelled **second lens**.

### Action at changeover

The supervisor must ensure that a plain sheet of graph paper, with no markings or measurements from previous candidates, is placed on the bench underneath the lamp for the next candidate. The supervisor must also ensure that the distances  $x$  and  $y$  are as shown in Fig. 2.1.

### Information required by Examiners

Sample set of numerical results, clearly marked 'supervisor's results', obtained out of sight of the candidates.

**Question 3**

**Items to be supplied by the Centre (per set of apparatus, unless otherwise specified):**

- metre rule
- G-clamp
- two 100 g masses
- 5 g to 10 g adhesive putty to attach the masses together and to attach the masses to the metre rule
- stopwatch reading to 0.1 s or better
- 30 cm ruler
- small piece of wood to use for protecting the scale on the metre rule.

**Action at changeover**

The supervisor must ensure that the apparatus is unassembled and placed on the bench.

**Information required by Examiners**

Sample set of numerical results, clearly marked 'supervisor's results', obtained out of sight of the candidates.

**Question 4**

Planning question – no apparatus is required for this question.

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**Supervisor's report**

Syllabus and component number

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Centre number

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Centre name .....

Time of the practical session .....

Laboratory name/number .....

**Give details of any difficulties experienced by the centre or by candidates (include the relevant candidate names and candidate numbers).**

You must include:

- any difficulties experienced by the centre in the preparation of materials
- any difficulties experienced by candidates, e.g. due to faulty materials or apparatus
- any specific assistance given to candidates.

## Declaration

- 1 Each packet that I am returning to Cambridge International contains all of the following items:
  - the scripts of the candidates specified on the bar code label provided
  - the supervisor's results relevant to these candidates
  - the supervisor's reports relevant to these candidates
  - seating plans for each practical session, referring to each candidate by candidate number
  - the attendance register.
- 2 Where the practical exam has taken place in more than one practical session, I have clearly labelled the supervisor's results, supervisor's reports and seating plans with the time and laboratory name/number for that practical session.
- 3 I have included details of difficulties relating to this practical session experienced by the centre or by candidates.
- 4 I have reported any other adverse circumstances affecting candidates, e.g. illness, bereavement or temporary injury, directly to Cambridge International on a *special consideration form*.

Signed ..... (supervisor)

Name (in block capitals) .....