www.dynamicpapers.com

Cambridge Assessment International Education

Cambridge O Level

PHYSICS **5054/31**

Paper 3 Practical Test **October/November 2023**

CONFIDENTIAL INSTRUCTIONS

4308648455

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.

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
  phone +44 1223 553554

DC (RW/JG) 316722/3
© UCLES 2023

[Turn over

www.dynamicpapers.com

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:

C	corrosive	**MH**	moderate hazard
HH	health hazard	**T**	acutely toxic
F	flammable	**O**	oxidising
N	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.

© UCLES 2023

www.dynamicpapers.com

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):

- 2.5 cm^3 dropping pipette (see Note 1)
- small beaker containing water
- plate (see Note 2)
- stop-watch reading to 0.1 s or better
- 30 cm ruler with mm divisions
- paper towels to mop up any spillages.

Notes

1. If the centre does not have graduated dropping pipettes marked with a scale then a glass dropping pipette is suitable. If any ungraduated pipette is used it must be marked with an indelible marker to show a volume of 1.0 cm^3.

2. A food plate with an internal diameter between 20 cm and 25 cm and depth between 1 and 2 cm is suitable. The plate must be filled to the rim with water.

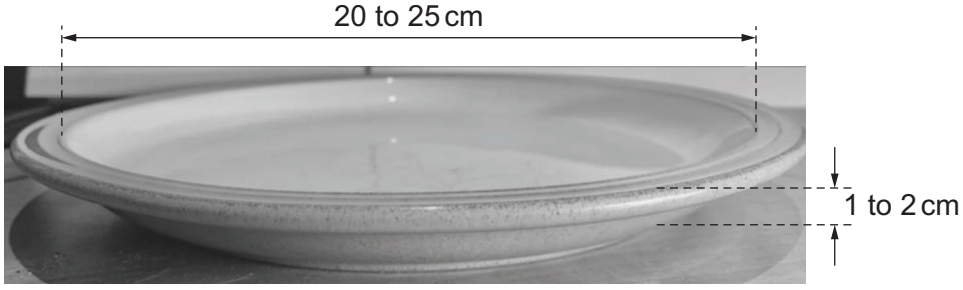


Fig. 1.1 (not to scale)

Action at changeover

The supervisor must ensure that the pipette is empty, the work station is dry and the plate is filled to the level of the rim with water.

Information required by examiners

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

© UCLES 2023

www.dynamicpapers.com

Question 2

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

- power source (see Note 1)
- switch or plug key
- voltmeter capable of measuring a potential difference of up to 5.0 V to a precision of 0.1 V or better – an analogue or digital meter is suitable
- resistor of resistance 10 Ω with a power rating of 2 W e.g. RS Stock No. 707-8782
- a 1.05 m length of 30 s.w.g. nichrome resistance wire attached to a metre rule
- connecting leads, one of which will be used as a flying lead (see Note 2).

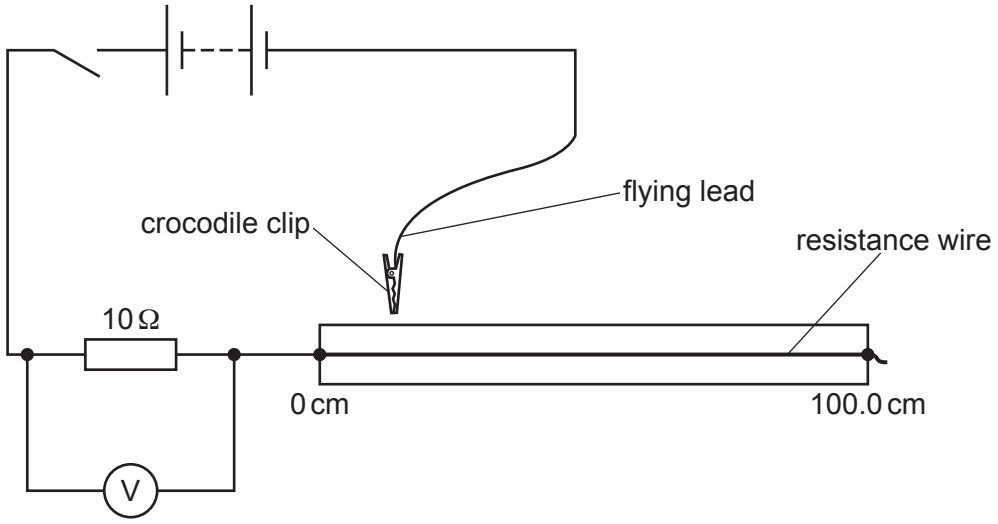


Fig. 2.1

Notes

1. The following are suitable power sources:
   - two 1.5 V dry cells in suitable holders connected in series
   - d.c. power supply of 3.0 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 supervisor should use the connecting leads to assemble the circuit shown in Fig. 2.1. The flying lead should have a crocodile clip at the end. Candidates must be told **not** to leave the crocodile clip attached to the resistance wire.

Action at changeover

The supervisor must check that the circuit is in the configuration shown in Fig. 2.1 with the switch open and the crocodile clip detached from the resistance wire. If cells are used, they should be checked and replaced, if necessary.

Information required by examiners

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

© UCLES 2023

www.dynamicpapers.com

Question 3

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

- two 100 g masses and one 100 g mass hanger
- a loop of string, around 8 cm–10 cm in circumference, used to suspend the mass hanger from the ruler
- a set square
- a metre rule
- a 30 cm ruler with mm divisions
- a small (about 5 g) piece of adhesive putty
- a glass ball with a diameter of 15 mm e.g. a marble (see Note 1)
- 50 g piece of modelling clay (see Note 2)
- a wooden strip (see Note 3)
- a stand, boss, clamp and G-clamp.

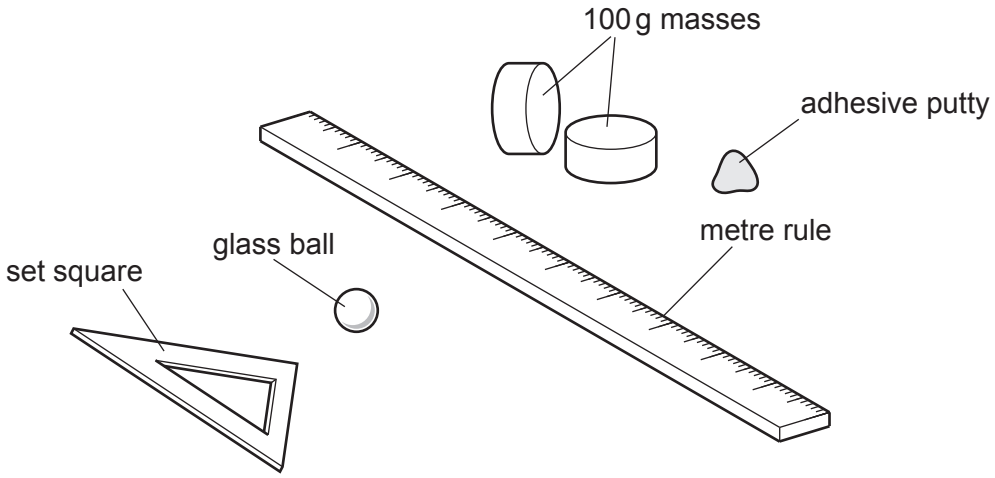


Fig. 3.1

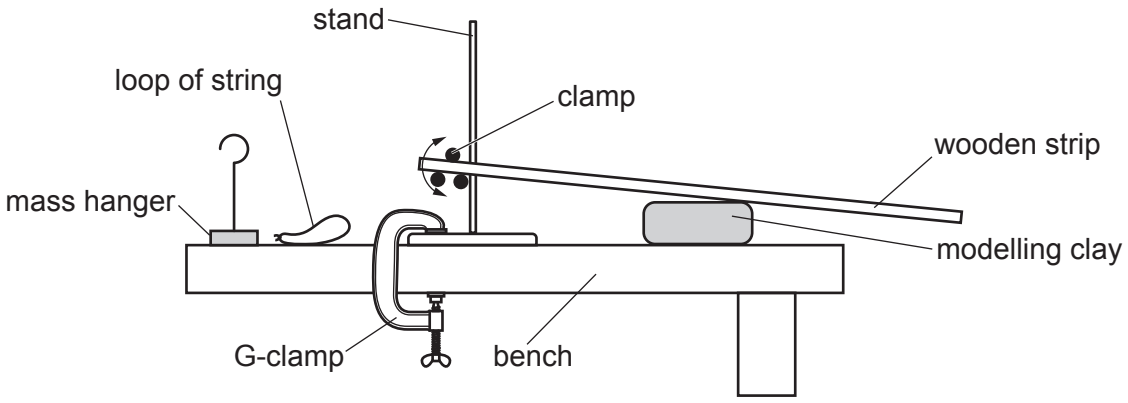


Fig. 3.2

Notes

1. The glass ball, set square, metre rule, adhesive putty and two 100 g masses must be placed near to each other on the bench as shown in Fig. 3.1.

2. The modelling clay must be shaped into a block of approximate length 5 cm, width 3 cm and depth 2 cm. The two faces with the largest areas must be rolled smooth using, e.g. a glass boiling tube. The glass ball will be used to make an indentation in the modelling clay. It is important that the clay is squished and squashed before it is shaped into the block to make it pliable.

© UCLES 2023

www.dynamicpapers.com

3. The supervisor must set up the apparatus as shown in Fig. 3.2. A wooden strip of approximate length 100 cm, e.g. another metre rule if one is available, must be attached to the clamp approximately 10 cm from one end. It must be possible for the shaft of the clamp to rotate freely in the boss when the boss is attached to the stand. The stick must be horizontal when it is balanced on top of the glass ball placed on top of the modelling clay. The other end of the wooden strip must overhang the bench by approximately 15 cm as in Fig. 3.2.

Action at changeover

The supervisor must ensure that the apparatus is as described in Note 1 and in the configuration shown in Fig. 3.2. Any indentations in the surfaces of the modelling clay must be removed by rolling it smooth again.

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.

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

© UCLES 2023

www.dynamicpapers.com

Supervisor's report

Syllabus and component number | | | | | / | | |

Centre number | | | | | |

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.

© UCLES 2023

[Turn over

www.dynamicpapers.com

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 each practical session.

3 I have included details of difficulties relating to each 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) .....

© UCLES 2023