



Cambridge IGCSE™

CO-ORDINATED SCIENCES

0654/52

Paper 5 Practical Test

May/June 2020

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.

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

This document has **12** pages. Blank pages are indicated.

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.

Specific information for this practical exam

During the exam, the supervisor (NOT the invigilator) must do the experiments in Questions 1, 2, 3, 4, 6 and 7 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

For Question 1

Each candidate will require:

- (i) small beaker containing approximately 50g apple puree in a water-bath at approximately 35 °C labelled **apple puree** (see note 1)
- (ii) 2 cm³ pectinase enzyme in a test-tube at approximately 35 °C labelled **enzyme** (see note 2)
- (iii) 25 cm³ measuring cylinder
- (iv) filter funnel (see note 3)
- (v) filter paper to fit filter funnel
- (vi) stirring rod
- (vii) stop-clock.

Note 1

Apple puree can be bought in tins or prepared from mashed apples and water. It should be loose enough to be easily poured. Additional water can be added to achieve this.

The water-bath at about 35 °C needs to be available throughout the examination. If candidates are sharing a water-bath a means of labelling the small beaker needs to be provided. A water-bath can be provided for each candidate using a larger container than the small beaker and a supply of warm water at 35–40 °C.

The water-bath must have a means of supporting the test-tube.

Note 2

Pectinase enzyme should be in the form of a solution (see www.ncbe.reading.ac.uk/materials/enzymes/pectinex.html).

Note 3

The filter funnel should be the largest that can safely be placed in the measuring cylinder.

For Question 2

Each candidate will require:

- (i) 2 × test-tubes (125 mm × 15 mm) each containing approximately 1 cm depth apple puree labelled **apple puree** (the same apple puree used for question 1) and means of supporting them
- (ii) two slices of white bread without crust approximately 2 cm × 2 cm side by side in a shallow dish
- [MH] (iii) Benedict's solution with dropper labelled **Benedict's solution**
- [C] (iv) biuret solution with dropper labelled **biuret solution**
- (v) iodine solution with dropper labelled **iodine solution**
- (vi) access to a water-bath of approximately 80 °C (see note 1)
- (vii) test-tube holders.

Note 1

If candidates are sharing a water-bath a means of labelling the test-tubes needs to be provided. A water-bath can be provided for each candidate using a larger container than the test-tubes and a supply of hot water at 80 °C.

The water-bath must have a means of supporting the test-tubes.

Note 2

It is expected that candidates will have either a watch or sight of a clock with a second hand.

For Question 3

Each candidate will require:

- [N] [C] (i) 10 cm³ of approximately 0.5 mol dm⁻³ copper(II) sulfate solution labelled **J**
low hazard (ii) 10 cm³ of approximately 0.5 mol dm⁻³ barium nitrate solution labelled **K**
[C] (iii) 10 cm³ of approximately 0.5 mol dm⁻³ sodium hydroxide solution labelled **L**
[MH] [N] (iv) 10 cm³ of approximately 1.0 mol dm⁻³ ammonia solution labelled **M**
(v) three test-tubes (approximately 125 mm × 15 mm) and a means of supporting them
(vi) two dropping pipettes
(vii) access to distilled or deionised water.

For Question 4

Each candidate will require:

- [MH] (i) 10 g of solid ammonium chloride labelled **ammonium chloride**
(ii) 100 cm³ glass beaker
(iii) 25 cm³ measuring cylinder
(iv) stirring thermometer -10 °C to +110 °C with 1 °C graduations
(v) access to distilled or deionised water.

For Question 5

No apparatus is required for this question.

For Question 6

Each candidate will require:

- (i) convex lens with focal length $f = 15$ cm, with holder
- (ii) metre rule
- (iii) 30 cm or 50 cm ruler
- (iv) white screen (see note 1)
- (v) an illuminated object (see note 2) with a translucent shape of an equilateral triangle of side approximately 2 cm (the object can be made by cutting a triangular hole in a piece of white card, and covering the hole with translucent paper as shown in Fig. 6.1).

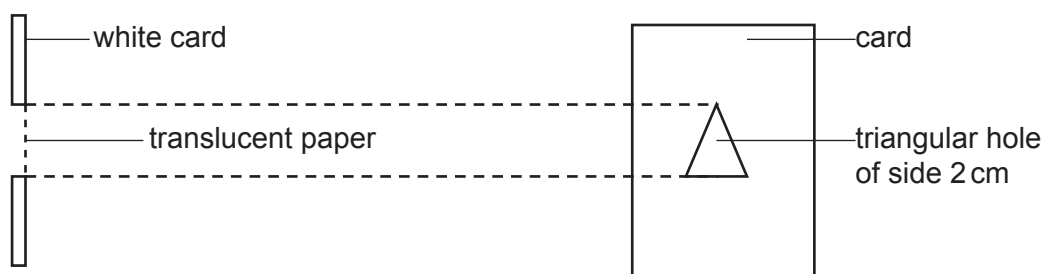


Fig. 6.1

Note 1

The screen can be made from a sheet of white card (approximately 10 cm × 10 cm). Some means of supporting the screen vertically must be supplied (e.g. fixing the white card to a small block of wood). See Fig. 6.2.

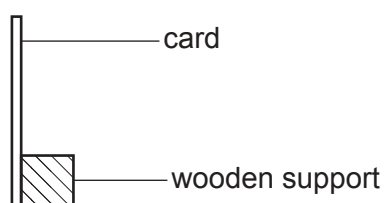
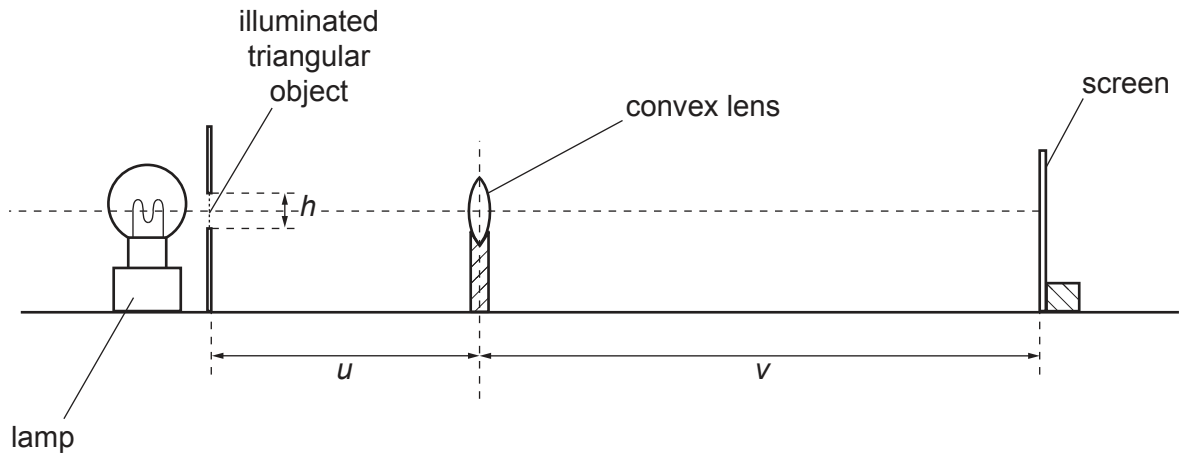


Fig. 6.2

Note 2

The illumination can be provided by a 12 V, 24 W lamp, or similar, connected to a suitable power source. The lamp filament, the centre of the hole in the object card and the centre of the lens and screen should be arranged to be the same height above the bench. See Fig. 6.3.

**Fig. 6.3**

For Question 7

Each candidate will require:

- (i) 250 cm³ beaker, labelled **P**
- (ii) 250 cm³ beaker, labelled **Q** (see note 1)
- (iii) 100 cm³ measuring cylinder
- (iv) supply of hot and cold (room temperature) water. Candidates will need 100 cm³ of each (see note 2)
- (v) stirring thermometer –10 °C to 110 °C, graduated in 1 °C intervals.

Note 1

A line must be drawn on the outside of beaker **Q** to indicate a volume of 100 cm³. A permanent marker pen is suitable for this purpose.

Note 2

The hot and cold water is to be provided by the supervisor for each candidate. The hot water should be supplied at a temperature of approximately 80 °C.

Note 3

Candidates should be told to take care and be warned of the danger of burns and scalds when using hot water.

Note 4

At changeover, empty and dry the beakers and ensure that more supplies of water are available.

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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 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)