

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 and 4 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

Question 1

Each candidate will require:

- (i) 10 cm³ milk, in a small beaker labelled **milk** (see note 1)
- (ii) 10 cm³ distilled water, in a small beaker labelled **water**
- (iii) 10 cm³ 15% sodium chloride solution, in a small beaker labelled **15% salt solution**
- [HH][C] (iv) 10 cm³ 1% protease solution, in a small beaker labelled **pepsin solution** (see note 2)
- (v) 4 test-tubes (approximately 125 mm × 15 mm) and a means to support them
- (vi) large beaker or container to act as a water-bath, to hold four test-tubes in (v)
- (vii) access to a supply of hot water at approximately 80 °C (see note 3)
- (viii) access to a supply of cold water
- (ix) stop-clock
- (x) four 5 cm³ syringes without needles
- (xi) permanent marker pen
- (xii) stirring thermometer, –10 °C to 110 °C, graduated in 1 °C intervals.

Notes

1. The milk should be made up using 2 g skimmed milk powder dissolved in 80 cm³ distilled water and made up to 100 cm³.
2. The protease solution should be made by dissolving 1 g pepsin powder in 80 cm³ distilled water and made up to 100 cm³. If liquid pepsin is used, add 1 cm³ pepsin to 99 cm³ distilled water and mix thoroughly.
3. Candidates should be warned of the dangers of burns or scalds when using very hot water.

Question 2

Each candidate will require:

- [MH] (i) 10 cm³ sulfuric acid of concentration 1.0 mol dm⁻³, labelled **E**
- [MH] (ii) 5 cm³ aqueous sodium hydroxide of concentration 0.4 mol dm⁻³, labelled **F**
- [MH] (iii) 10 cm³ limewater, labelled **limewater**
- [MH] (iv) access to dilute nitric acid of concentration 0.4 mol dm⁻³, labelled **dilute nitric acid**
- (v) access to aqueous barium nitrate of concentration 0.1 mol dm⁻³, labelled **barium nitrate**
- (vi) access to aqueous silver nitrate of concentration 0.05 mol dm⁻³, labelled **silver nitrate**
- [MH] (vii) 5 cm³ aqueous iron(II) sulfate solution of concentration 0.5 mol dm⁻³, labelled **iron(II) sulfate**
- (viii) stirring rod
- (ix) 3 pieces of universal indicator paper and access to a pH colour chart
- (x) piece of magnesium ribbon of length 2 cm
- (xi) splint and a means to light it
- (xii) delivery tube with a bung to fit test-tubes in (xiii) which can lead into a second test-tube
- (xiii) 5 test-tubes (approximately 125 mm × 15 mm) and a means to support them.

Question 3

No apparatus is required for this question.

Question 4

Each candidate will require:

- (i) plastic drinks cup with lid (see note 1)
- (ii) thermometer -10°C to 110°C graduated in 1°C intervals
- (iii) stand, boss and clamp (see note 2)
- (iv) stop-clock
- (v) 100 cm^3 or 250 cm^3 measuring cylinder
- (vi) supply of hot water (see notes 3 and 4).

Notes

1. The lid should be close-fitting with a hole in it big enough to insert a thermometer. If it is not possible to get a plastic drinks cup with a lid, then this can be replaced with any container, with a capacity of about 200 cm^3 , for which you can make a close-fitting lid with a hole in it.
2. The thermometer should be fitted vertically in the clamp, as shown in Fig. 4.1.

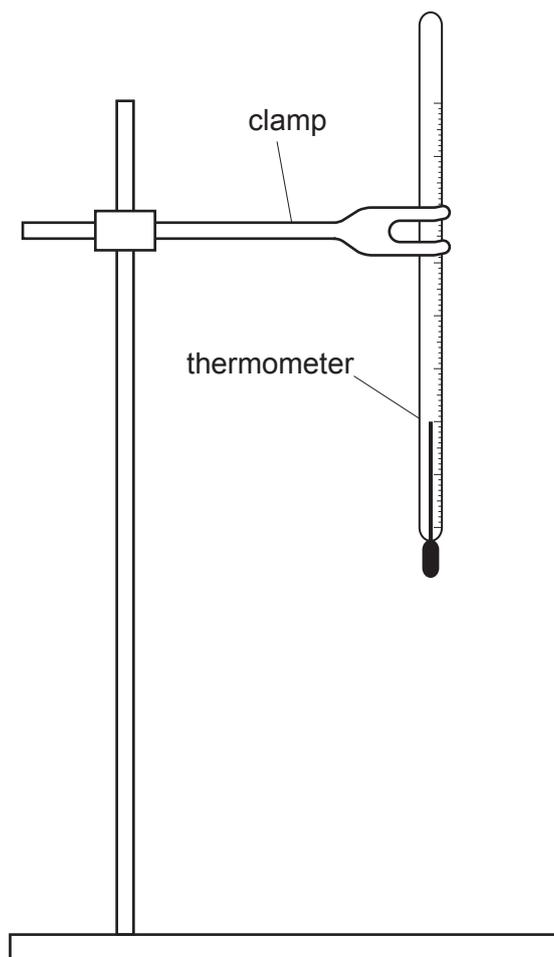


Fig. 4.1

3. Each candidate will require approximately 400 cm^3 of hot water. The hot water should be supplied and maintained at a temperature of approximately $80\text{ }^\circ\text{C}$.
4. Candidates should be warned of the dangers of burns or scalds when using very hot water.
5. At changeover, empty the water from the cup and raise the thermometer above the top of the cup.

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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)