



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education (9–1)

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**CO-ORDINATED SCIENCES**

**0973/05**

Paper 5 Practical Test

**For Examination from 2019**

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 CIE 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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If you have any queries regarding these Confidential Instructions, contact CIE stating the centre number, the syllabus and component number and the nature of the query.

by email: [info@cie.org.uk](mailto:info@cie.org.uk)  
by phone: +44 1223 553554  
by fax: +44 1223 553558

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This document consists of **9** printed pages and **1** blank page.

## 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, 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) a fresh celery stalk of 5–6 cm length without leaves
- (ii) hand lens
- (iii) white tile
- (iv) knife or cutting blade
- (v) stopclock or sight of a clock with a seconds hand
- (vi) small beaker, e.g. 100 cm<sup>3</sup>, or shallow dish, with red coloured water to a depth of about 1 cm

#### Notes

- 1 Coloured water can be made using 1 cm<sup>3</sup> of red food colouring in 100 cm<sup>3</sup> distilled water.

#### For Question 2

Each candidate will require

- (i) 6 dropping pipettes
- (ii) a white spotting tile with deep wells, (five heavy glass watch glasses with flat bases placed on white paper may be used as an alternative)
- (iii) 10 cm<sup>3</sup> DCPIP (2,6-dichlorophenolindophenol) solution, labelled DCPIP. This will decolourise readily by oxidation with air and should be freshly prepared and kept in a stoppered bottle, preferably made of dark glass
- (iv) 10 cm<sup>3</sup> of each of the following concentrations of vitamin C

percentage concentration of vitamin C
0.25% (labelled 0.25% vitamin C)
0.50% (labelled 0.50% vitamin C)
0.75% (labelled 0.75% vitamin C)
1.00% (labelled 1.00% vitamin C)

- (v) 10 cm<sup>3</sup> of lemon juice or other locally available lightly coloured fruit juice, labelled fruit juice. See note 1.

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'.

### Notes

- 1 The juice should be tested to ensure it will decolourise two drops of DCPIP solution using less than a full well of juice.
- 2 The apparatus should be tested to ensure that the spotting tiles/watch glass wells are deep enough. They should be big enough to contain two drops of DCPIP plus enough drops of 0.50% vitamin C to decolourise this amount of DCPIP.

### For Question 3

Each candidate will require

- [HH][N] (i) 1.5g of a mixture, made up of equal masses of copper(II) oxide and calcium oxide, [C][MH] labelled **H**
- (ii) approximately 50 cm<sup>3</sup> distilled water labelled **distilled water**
- [C] (iii) approximately 30 cm<sup>3</sup> 1.0 mol dm<sup>-3</sup> nitric acid labelled **dilute nitric acid**
- [C][MH][N](iv) approximately 20 cm<sup>3</sup> 2.0 mol dm<sup>-3</sup> ammonia labelled **ammonia solution**
- [MH] (v) approximately 40 cm<sup>3</sup> 0.4 mol dm<sup>-3</sup> sodium hydroxide labelled **sodium hydroxide solution**
- (vi) three test-tubes (125 mm × 15 mm)
- (vii) one test-tube (150 mm × 25 mm)
- (viii) spatula
- (ix) stirring rod
- (x) two filter funnels (if 1 funnel is supplied it may need washing during the examination)
- (xi) three pieces of filter paper
- [F] (xii) full range Universal Indicator solution labelled **Universal Indicator** and with a suitable dropping pipette and chart
- (xiii) two small beakers (100 cm<sup>3</sup>)
- (xiv) Bunsen burner and the means to light it
- (xv) tripod and gauze
- (xvi) dropping pipette
- (xvii) red litmus paper

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'.

(xviii) 25 cm<sup>3</sup> measuring cylinder

(xix) paper towels

### Notes

- 1 Centres may provide fewer test-tubes, the minimum being two test-tubes (125 mm × 15 mm). If this is the case, candidates will have to rinse test-tubes with distilled water which must be provided.

### For Question 4

Each candidate will require

(i) stopwatch

(ii) thermometer –10 °C to +110 °C with 1 °C graduations

(iii) plastic cup

[F][N] (iv) 3 g of fresh zinc powder labelled L

(v) 25 cm<sup>3</sup> measuring cylinder

[MH][N] (vi) 30 cm<sup>3</sup> 200 g dm<sup>-3</sup> copper sulfate, CuSO<sub>4</sub>.5H<sub>2</sub>O, labelled N

(vii) stirring rod

### Notes

- 1 The heavy metals in this experiment should be disposed of in a way that does not harm the environment.

### For Question 5

No apparatus is required for this question.

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 6

Each candidate will require

- (i) steel spring. An expendable steel spring is suitable, for example a 55mm long spring of diameter 15mm. The spring must be capable of supporting at least 600g without overstretching
- (ii) clamp, stand and boss set up as shown in Fig. 6.1. See note 1.
- (iii) masses of 0.1 kg, 0.2 kg, 0.3 kg, 0.4 kg and 0.5 kg. A 0.1 kg mass hanger with four 0.1 kg slotted masses is ideal; if these are not available, a suitable lightweight hook must be provided so that the masses can be hung from the spring
- (iv) stopwatch measuring to at least 0.1 s.

### Notes

- 1 The stand may need to be clamped securely to the bench to avoid toppling.

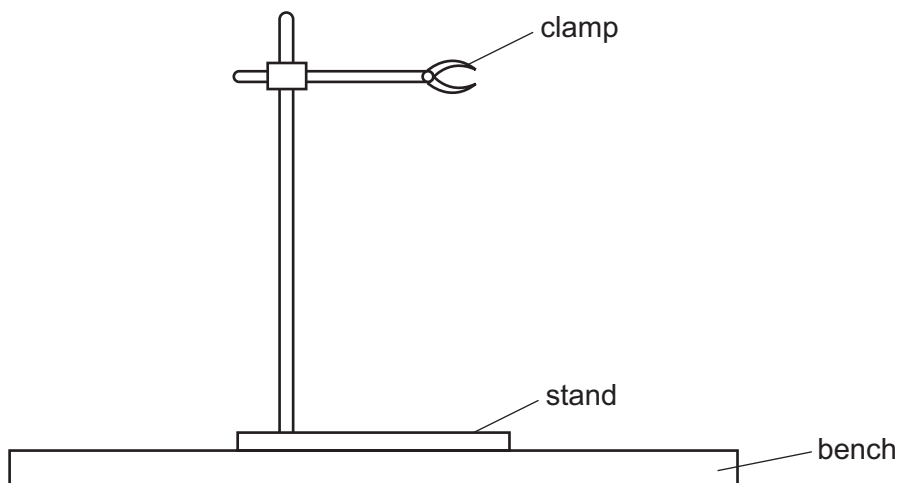


Fig. 6.1

**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 7**

Each candidate will require

- (i) a piece of modelling clay of mass approximately 100 g. The modelling clay should be softened and moulded into a rough spherical shape
- (ii) 30 cm ruler capable of measuring to 1 mm
- (iii) pivot – a prism or wooden block placed on the bench
- (iv) metre rule capable of measuring to 1 mm
- (v) a 50 g mass fixed to the metre rule with its centre above the 10.0 cm mark on the rule

**Action at changeover**

Modelling clay should be remoulded into a roughly spherical shape.

Check that 50 g mass is secured to the metre rule with its centre over the 10.0 cm mark on the rule.

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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.

Space for supervisor to record results, if relevant, e.g. temperature of the laboratory; results for Question 1.

## Declaration

- 1 Each packet that I am returning to CIE 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 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 CIE on a *special consideration form*.

Signed ..... (supervisor)

Name (in block capitals) .....