Cambridge Assessment International Education

Cambridge International AS & A Level

BIOLOGY **9700/31**

Paper 3 Advanced Practical Skills 1 **May/June 2025**

CONFIDENTIAL INSTRUCTIONS

4150726648

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 **8** pages.

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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

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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.
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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.

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Specific information for this practical exam

During the exam, the supervisor or other competent biologist (**not** the invigilator) should obtain the results needed for the supervisor's report by following the relevant steps in the question paper. The results should be recorded in the supervisor's report.

Organisation of the exam

- All candidates must have access to the materials required for Question 1 throughout the whole period of the exam.
- Half of the candidates will have access to the microscope and slide for a maximum time of one hour from the start of the exam. These candidates should start with Question 2. After one hour, or sooner if candidates have finished Question 2, they should move on to Question 1.
- For Question 2, two candidates are **not** permitted to share the same microscope and slide at the same time.
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- Access arrangements to microscopes and slides, including instructions on which question to start with and timings, must be explained to candidates before the start of the exam.

Materials to be supplied by Cambridge International

- Slide **J1**

On receipt of the slides, check that they are labelled **J1** and that no slides are broken. The slides must **not** be viewed in advance of the exam. The material on the slides is confidential and must **not** be disclosed to candidates.

The number of slides supplied by Cambridge International will be equal to half the candidate entry.

Return of slides to Cambridge International

Immediately after the exam, the slides must be:

- returned to Cambridge International in the boxes in which they were received, using the self-adhesive label supplied. The slides must **not** be included in the packet of scripts.

or

- purchased using the order form enclosed with the slides, which should be completed and returned to Cambridge International. The order form must **not** be included in the packet of scripts. Slides and boxes will be charged at the rate of £3.25 per slide plus £1 per box.

If the slides are **not** returned or purchased by the deadline stated on the order form, the charge will be £3.75 per slide plus £1 per box.

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Materials and apparatus for Question 1

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
[MH] 2.0 mol dm^{-3} hydrochloric acid in a beaker, labelled **H**	at least 30 cm^3	
0.1 mol dm^{-3} hydrochloric acid in a beaker, labelled **U**	at least 10 cm^3	
Distilled water in a beaker, labelled **W**	at least 50 cm^3	
Agar containing 0.1% bromothymol blue indicator solution, in a test-tube (see **Preparation of materials**)	6	
10 cm^3 syringe	1	
1 cm^3 syringe	1	
Beakers, capacity 50–100 cm^3	5	
Container with approximately 200 cm^3 of tap water, labelled **For washing**	1	
Container, capacity approximately 400 cm^3, labelled **For waste**	1	
Paper towels	8	
Marker pen, permanent	1	
Ruler, showing mm	1	
Stop-clock or timer, showing seconds	1	
Suitable eye protection	1	

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Preparation of materials

All the materials may be prepared the day before the exam. The test-tubes containing blue agar should be covered and left overnight at room temperature.

[F][MH] [HH]

- 0.1% bromothymol blue solution

  Prepare 0.1 mol dm^{-3} sodium hydroxide solution by putting 0.4 g of sodium hydroxide **[C]** into a beaker and making up to 100 cm^3 with distilled water. Mix well.

  The 0.1% bromothymol blue solution is prepared by putting 0.1 g of bromothymol blue into a beaker containing 1.6 cm^3 of 0.1 mol dm^{-3} sodium hydroxide solution. Mix well. Make up to 100 cm^3 with distilled water. Mix well.

- Agar, containing 0.1% bromothymol blue indicator solution

  Put 9 g of agar powder ('technical' not 'nutrient') into 285 cm^3 of distilled water.
  To dissolve the agar, heat to boiling while stirring continuously. This may start to froth up towards the top of the container – to avoid it overflowing, switch off or remove from the heat, then continue heating until the agar has dissolved.
  Put 15 cm^3 of 0.1% bromothymol blue solution into the hot agar and mix gently to produce a uniform blue colour.
  If the agar is not blue, add small volumes of 0.1 mol dm^{-3} sodium hydroxide solution until a blue colour is seen.

  Pour the agar into test-tubes until the agar is approximately 4 cm deep. There should be no bubbles in the agar. If a layer of bubbles forms, warm the test-tube to melt the agar and allow it to reset.

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Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Microscope with: ● an eyepiece lens, ×10 magnification ● a low-power objective lens, ×10 magnification ● a high-power objective lens, ×40 magnification	1 between 2	
Slide **J1**	1 between 2	

Preparation of materials

- Microscope

  Any lenses which are **not** ×10 or ×40 should be removed or replaced.

  For each candidate:
  – the microscope must be set up on low power
  – the slide must **not** be on the stage of the microscope.

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Supervisor's report

Syllabus and component number	9	7	0	0	/	3	1
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:
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- any difficulties experienced by candidates, e.g. due to faulty materials or apparatus
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Temperature of exam room .....°C

Results for Question **1(a)(ii)**

Declaration

1 Each packet that I am returning to Cambridge International contains all of the following items:
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- 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) .....

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Cambridge Assessment International Education

Cambridge International AS & A Level

BIOLOGY **9700/32**

Paper 3 Advanced Practical Skills 2 **May/June 2025**

CONFIDENTIAL INSTRUCTIONS

3527723923

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Materials to be supplied by Cambridge International

- Slide **K1**

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Return of slides to Cambridge International

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If the slides are **not** returned or purchased by the deadline stated on the order form, the charge will be £3.75 per slide plus £1 per box.

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Materials and apparatus for Question 1

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Invertase extract, in a beaker, labelled **E** (see **Preparation of materials**)	at least 20 cm^3	
0.5% glucose solution, in a beaker, labelled **R** (see **Preparation of materials**)	at least 40 cm^3	
0.2% sucrose solution, in a beaker, labelled **S** (see **Preparation of materials**)	at least 20 cm^3	
Distilled water, in a beaker, labelled **W**	at least 100 cm^3	
Benedict's solution, in a beaker, labelled **Benedict's**	at least 20 cm^3	
10 cm^3 syringes	2	
5 cm^3 syringes	2	
1 cm^3 syringes	3	
Beakers, capacity 50–100 cm^3	5	
Test-tubes, small, capacity 20–30 cm^3	7	
Test-tube rack to hold 7 small test-tubes	1	
Test-tube holder, to hold hot test-tubes	1	
Bunsen burner, tripod, gauze, bench mat and lighter or matches	1	
Beaker, capacity approximately 400 cm^3, suitable for heating as a water-bath, with approximately 200 cm^3 of tap water at 40–50 °C, labelled **water-bath**	1	
Container with approximately 200 cm^3 tap water, labelled **For washing**	1	
Container, capacity approximately 300 cm^3, labelled **For waste**	1	
Paper towels	8	
Marker pen, permanent	1	
Stop-clock or timer showing seconds	1	
Suitable eye protection	1	

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Preparation of materials

Each solution should be kept in a covered container in a refrigerator. Solutions should be at room temperature before the start of the exam.

The invertase extract is prepared from yeast the day before the exam. The yeast will need to be left overnight. Do **not** stir this again as it is the supernatant that is needed.

- **E**, invertase extract

  This is prepared the day before the exam. Add 10 g of dried yeast to 100 cm^3 distilled water and mix well. This should be left covered in a refrigerator overnight. On the day of the exam, remove the yeast from the fridge but do **not** stir it. The supernatant (invertase extract) is then carefully poured off into a clean beaker.

- **R**, 0.5% reducing sugar solution

  This is prepared by adding 0.5 g of glucose to 80 cm^3 distilled water and making up to 100 cm^3 with distilled water.

- **S**, 0.2% sucrose solution

  This is prepared by adding 0.2 g of sucrose to 80 cm^3 of distilled water and making up to 100 cm^3 with distilled water.

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Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Microscope with: ● an eyepiece lens, ×10 magnification ● a low-power objective lens, ×10 magnification ● a high-power objective lens, ×40 magnification	1 between 2	
Slide **K1**	1 between 2	

Preparation of materials

- Microscope

  Any lenses which are **not** ×10 or ×40 should be removed or replaced.

  For each candidate:
  – the microscope must be set up on low power
  – the slide must **not** be on the stage of the microscope.

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Supervisor's report

Syllabus and component number	9	7	0	0	/	3	2
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).

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Temperature of exam room ..... °C

Results for Question **1(a)(ii)**

Results for Question **1(a)(iii)**

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Signed ..... (supervisor)

Name (in block capitals) .....

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Cambridge Assessment International Education

Cambridge International AS & A Level

BIOLOGY **9700/33**

Paper 3 Advanced Practical Skills 1 **May/June 2025**

CONFIDENTIAL INSTRUCTIONS

4520445098

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[Turn over

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Materials to be supplied by Cambridge International

- Slide **L1**

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Materials and apparatus for Question 1

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
2.0 mol dm^{-3} sodium chloride solution in a beaker labelled **S** (see **Preparation of materials**).	at least 200 cm^3	
5 cylinders of potato tissue in a beaker of distilled water, labelled **P** (see **Preparation of materials**).	1	
10 cm^3 syringe	1	
Beakers, internal diameter at least 50 mm and depth at least 20 mm	5	
Forceps, blunt	1	
White tile or cutting surface	1	
Single-edged blade or scalpel	1	
Container, capacity approximately 400 cm^3, labelled **For waste**	1	
Paper towels	8	
Marker pen, permanent	1	
Ruler, showing mm	1	
Stop-clock or timer	1	
Suitable eye protection	1	

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Preparation of materials

P must be prepared the day before the exam and left in distilled water at room temperature overnight. **S** should be kept in a covered container at room temperature.

- **S**, 2.0 mol dm^{-3} sodium chloride solution

  This is prepared by putting 23.2 g sodium chloride into a beaker and making up to 200 cm^3 with distilled water. Mix well.

- **P**, potato cylinders

  These are prepared using a cork borer. The cork borer should ideally have a diameter of 10 mm.
  The potato cylinders should be cut to a length of approximately 50 mm. These should be left in distilled water at room temperature overnight. On the day of the exam pour off the distilled water and supply each candidate with 5 potato cylinders in a beaker with fresh distilled water.

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[Turn over

Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Microscope with: ● an eyepiece lens, ×10 magnification ● a low-power objective lens, ×10 magnification ● a high-power objective lens, ×40 magnification	1 between 2	
Slide **L1**	1 between 2	

Preparation of materials

- Microscope

  Any lenses which are **not** ×10 or ×40 should be removed or replaced.

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Temperature of exam room ..... °C

Diameter of potato cylinders = ... mm

Results for Question **1(a)(v)**

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Signed ..... (supervisor)

Name (in block capitals) .....

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Cambridge Assessment International Education

Cambridge International AS & A Level

BIOLOGY **9700/34**

Paper 3 Advanced Practical Skills 2 **May/June 2025**

CONFIDENTIAL INSTRUCTIONS

1456819848

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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.

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Specific information for this practical exam

During the exam, the supervisor or other competent biologist (**not** the invigilator) should obtain the results needed for the supervisor's report by following the relevant steps in the question paper. The results should be recorded in the supervisor's report.

Organisation of the exam

- All candidates must have access to the materials required for Question 1 throughout the whole period of the exam.
- Half of the candidates will have access to the microscope and slide for a maximum time of one hour from the start of the exam. These candidates should start with Question 2. After one hour, or sooner if candidates have finished Question 2, they should move on to Question 1.
- For Question 2, two candidates are **not** permitted to share the same microscope and slide at the same time.
- The other candidates should start with Question 1. After one hour, these candidates should be given access to the microscope and slide. They should then move on to Question 2 as soon as they are ready.
- Candidates will only have access to the microscope and slide for one hour. They should be advised that they can answer any part of the exam paper not requiring the microscope and slide throughout the whole period of the exam.
- Access arrangements to microscopes and slides, including instructions on which question to start with and timings, must be explained to candidates before the start of the exam.

Materials to be supplied by Cambridge International

- Slide **M1**

On receipt of the slides, check that they are labelled **M1** and that no slides are broken. The slides must **not** be viewed in advance of the exam. The material on the slides is confidential and must **not** be disclosed to candidates.

The number of slides supplied by Cambridge International will be equal to half the candidate entry.

Return of slides to Cambridge International

Immediately after the exam, the slides must be:

- returned to Cambridge International in the boxes in which they were received, using the self-adhesive label supplied. The slides must **not** be included in the packet of scripts.

or

- purchased using the order form enclosed with the slides, which should be completed and returned to Cambridge International. The order form must **not** be included in the packet of scripts. Slides and boxes will be charged at the rate of £3.25 per slide plus £1 per box.

If the slides are **not** returned or purchased by the deadline stated on the order form, the charge will be £3.75 per slide plus £1 per box.

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Materials and apparatus for Question 1

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
3.0% yeast suspension in a beaker, labelled **Y** (see **Preparation of materials**)	at least 20 cm^3	
[MH] 1.5% (5 vols) hydrogen peroxide in a beaker, labelled **H**	at least 20 cm^3	
[MH] 1.0% copper sulfate in a beaker, labelled **C** (see **Preparation of materials**)	at least 30 cm^3	
[MH] 0.2% copper sulfate in a beaker, labelled **R** (see **Preparation of materials**)	at least 20 cm^3	
[MH][N] 1.0% potassium manganate(VII) in a beaker, labelled **P** (see **Preparation of materials**)	at least 30 cm^3	
[MH] 1.0 $mol\,dm^{-3}$ sulfuric acid in a beaker, labelled **A**	at least 30 cm^3	
Distilled water in a beaker, labelled **W**	at least 150 cm^3	
10 cm^3 syringes	2	
5 cm^3 syringe	1	
1 cm^3 or 2 cm^3 syringe, labelled **P**	1	
1 cm^3 syringes	3	
Beakers, capacity 25–50 cm^3	5	
Test-tubes, large, capacity 40–55 cm^3	6	
Test-tube rack to hold 6 large test-tubes	1	
White card, approximately 10 cm × 10 cm	1	
Container with approximately 200 cm^3 of tap water, labelled **For washing**	1	
Container, capacity approximately 400 cm^3, labelled **For waste**	1	
Paper towels	8	
Marker pen, permanent	1	
Stop-clock or timer, showing seconds	1	
Suitable eye protection	1	
Disposable gloves	1 pair	

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Preparation of materials

Y must be prepared approximately one hour before the exam and kept at room temperature. The dried yeast must be suitable for use in baking.

All other materials may be prepared the day before the exam.

Each solution should be kept in a covered container in a refrigerator. Solutions should be at room temperature before the start of the exam.

- **Y**, 3.0% yeast suspension

  This is prepared by putting 3 g of dried yeast into 50 cm^3 of warm distilled water (approximately 30 °C) and making up to 100 cm^3 with warm distilled water. Stir well.

  Stir well before **Y** is put into the beakers used by the candidates.

- **C**, 1.0% copper sulfate solution

  This is prepared by putting 1 g of copper sulfate pentahydrate ($CuSO_4 \cdot 5H_2O$) **[MH][N][C]** into 80 cm^3 of distilled water and making up to 100 cm^3 with distilled water. Mix well.

- **R**, 0.2% copper sulfate solution

  This is prepared by putting 20 cm^3 of **C** in a beaker and making up to 100 cm^3 with distilled water. Mix well.

[MH] [N]

- **P**, 1.0% potassium manganate(VII) solution

  This is prepared by putting 1 g of potassium manganate(VII) **[O][MH][HH][N]** into 80 cm^3 of distilled water in a beaker and making up to 100 cm^3 with distilled water. Mix well.

  Potassium manganate(VII) is also known as potassium permanganate.

Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Microscope with: • an eyepiece lens, ×10 magnification • a low-power objective lens, ×10 magnification • a high-power objective lens, ×40 magnification	1 between 2	
Slide **M1**	1 between 2	

Preparation of materials

- Microscope

  Any lenses which are **not** ×10 or ×40 should be removed or replaced.

  For each candidate:
  – the microscope must be set up on low power
  – the slide must **not** be on the stage of the microscope.

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Supervisor's report

Syllabus and component number	9	7	0	0	/	3	4
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.

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Temperature of exam room ..... °C

Results for Question **1(a)(ii)**

Results for Question **1(a)(v)**

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) .....

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Cambridge Assessment International Education

Cambridge International AS & A Level

BIOLOGY **9700/35**

Paper 3 Advanced Practical Skills 1 **May/June 2025**

CONFIDENTIAL INSTRUCTIONS

8115773423

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 (PB) 366611/3
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[Turn over

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.

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Specific information for this practical exam

During the exam, the supervisor or other competent biologist (**not** the invigilator) should obtain the results needed for the supervisor's report by following the relevant steps in the question paper. The results should be recorded in the supervisor's report.

Organisation of the exam

- All candidates must have access to the materials required for Question 1 throughout the whole period of the exam.
- Half of the candidates will have access to the microscope and slide for a maximum time of one hour from the start of the exam. These candidates should start with Question 2. After one hour, or sooner if candidates have finished Question 2, they should move on to Question 1.
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- Candidates will only have access to the microscope and slide for one hour. They should be advised that they can answer any part of the exam paper not requiring the microscope and slide throughout the whole period of the exam.
- Access arrangements to microscopes and slides, including instructions on which question to start with and timings, must be explained to candidates before the start of the exam.

Materials to be supplied by Cambridge International

- Slide **N1**

  On receipt of the slides, check that they are labelled **N1** and that no slides are broken. The slides must **not** be viewed in advance of the exam. The material on the slides is confidential and must **not** be disclosed to candidates.

  The number of slides supplied by Cambridge International will be equal to half the candidate entry.

Return of slides to Cambridge International

Immediately after the exam, the slides must be:

- returned to Cambridge International in the boxes in which they were received, using the self-adhesive label supplied. The slides must **not** be included in the packet of scripts.

or

- purchased using the order form enclosed with the slides, which should be completed and returned to Cambridge International. The order form must **not** be included in the packet of scripts. Slides and boxes will be charged at the rate of £3.25 per slide plus £1 per box.

If the slides are **not** returned or purchased by the deadline stated on the order form, the charge will be £3.75 per slide plus £1 per box.

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Materials and apparatus for Question 1

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
100% catalase solution, in a beaker labelled **E** (see **preparation of materials**)	at least 50 cm^3	
3% hydrogen peroxide solution, in a beaker labelled **H**	at least 30 cm^3	
Distilled water, in a beaker labelled **W**	at least 100 cm^3	
10 cm^3 syringes	3	
Beakers, capacity 50–100 cm^3	5	
Test-tubes, large, capacity 40–55 cm^3	5	
Test-tube rack, to hold 5 large test-tubes	1	
Glass rod	1	
Container with approximately 250 cm^3 tap water, labelled **For washing**	1	
Container, capacity approximately 400 cm^3, labelled **For waste**	1	
Paper towels	8	
Marker pen, permanent	1	
Stop-clock or timer showing seconds	1	
Suitable eye protection	1	

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Preparation of materials

The catalase extract is prepared from chickpeas the day before the exam. The chickpeas will need to be left to soak overnight.

All the materials should be at room temperature before the start of the exam.

- **E**, 100% catalase solution

  To prepare the catalase extract, put 50 g of dried chickpeas in 200 cm^3 of distilled water and leave them to soak overnight.
  On the morning of the exam, blend the soaked chickpeas with the water to form a smooth paste. Filter this through mesh (such as muslin cloth). The liquid collected is the catalase extract.

  Pre-test:
  Put 1 cm^3 of 3% hydrogen peroxide and 1 cm^3 of the catalase extract in a small test-tube. After 60 seconds, the height of the foam should be approximately 0.5–1.0 cm. The extract may need to be diluted with distilled water to achieve this.

  Alternatives to chickpeas can also be used, such as: adzuki beans, soya beans or black-eyed beans.

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Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Microscope with: ● an eyepiece lens, ×10 magnification ● a low-power objective lens, ×10 magnification ● a high-power objective lens, ×40 magnification	1 between 2	
Slide **N1**	1 between 2	

Preparation of materials

- Microscope

  Any lenses which are **not** ×10 or ×40 should be removed or replaced.

  For each candidate:
  – the microscope must be set up on low power
  – the slide must **not** be on the stage of the microscope.

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Supervisor's report

Syllabus and component number	9	7	0	0	/	3	5
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.

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Temperature of exam room ..... °C

Results for Question **1(a)(ii)**

Declaration

1 Each packet that I am returning to Cambridge International contains all of the following items:
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- 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) .....

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Cambridge Assessment International Education

Cambridge International AS & A Level

BIOLOGY **9700/37**

Paper 3 Advanced Practical Skills 1 **May/June 2025**

CONFIDENTIAL INSTRUCTIONS

9437682181

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

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[Turn over

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.

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Specific information for this practical exam

During the exam, the supervisor or other competent biologist (**not** the invigilator) should obtain the results needed for the supervisor's report by following the relevant steps in the question paper. The results should be recorded in the supervisor's report.

Organisation of the exam

- All candidates must have access to the materials required for Question 1 throughout the whole period of the exam.
- Half of the candidates will have access to the microscope and slide for a maximum time of one hour from the start of the exam. These candidates should start with Question 2. After one hour, or sooner if candidates have finished Question 2, they should move on to Question 1.
- For Question 2, two candidates are **not** permitted to share the same microscope and slide at the same time.
- The other candidates should start with Question 1. After one hour, these candidates should be given access to the microscope and slide. They should then move on to Question 2 as soon as they are ready.
- Candidates will only have access to the microscope and slide for one hour. They should be advised that they can answer any part of the exam paper not requiring the microscope and slide throughout the whole period of the exam.
- Access arrangements to microscopes and slides, including instructions on which question to start with and timings, must be explained to candidates before the start of the exam.

Materials to be supplied by Cambridge International

- Slide **L1**

On receipt of the slides, check that they are labelled **L1** and that no slides are broken. The slides must **not** be viewed in advance of the exam. The material on the slides is confidential and must **not** be disclosed to candidates.

The number of slides supplied by Cambridge International will be equal to half the candidate entry.

Return of slides to Cambridge International

Immediately after the exam, the slides must be:

- returned to Cambridge International in the boxes in which they were received, using the self-adhesive label supplied. The slides must **not** be included in the packet of scripts.

or

- purchased using the order form enclosed with the slides, which should be completed and returned to Cambridge International. The order form must **not** be included in the packet of scripts. Slides and boxes will be charged at the rate of £3.25 per slide plus £1 per box.

If the slides are **not** returned or purchased by the deadline stated on the order form, the charge will be £3.75 per slide plus £1 per box.

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Materials and apparatus for Question 1

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
2.0 mol dm^{-3} sodium chloride solution in a beaker labelled **S** (see **Preparation of materials**).	at least 200 cm^3	
5 cylinders of potato tissue in a beaker of distilled water, labelled **P** (see **Preparation of materials**).	1	
10 cm^3 syringe	1	
Beakers, internal diameter at least 50 mm and depth at least 20 mm	5	
Forceps, blunt	1	
White tile or cutting surface	1	
Single-edged blade or scalpel	1	
Container, capacity approximately 400 cm^3, labelled **For waste**	1	
Paper towels	8	
Marker pen, permanent	1	
Ruler, showing mm	1	
Stop-clock or timer	1	
Suitable eye protection	1	

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Preparation of materials

P must be prepared the day before the exam and left in distilled water at room temperature overnight. **S** should be kept in a covered container at room temperature.

- **S**, 2.0 mol dm^{-3} sodium chloride solution

  This is prepared by putting 23.2 g sodium chloride into a beaker and making up to 200 cm^3 with distilled water. Mix well.

- **P**, potato cylinders

  These are prepared using a cork borer. The cork borer should ideally have a diameter of 10 mm.
  The potato cylinders should be cut to a length of approximately 50 mm. These should be left in distilled water at room temperature overnight. On the day of the exam pour off the distilled water and supply each candidate with 5 potato cylinders in a beaker with fresh distilled water.

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[Turn over

Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Microscope with: ● an eyepiece lens, ×10 magnification ● a low-power objective lens, ×10 magnification ● a high-power objective lens, ×40 magnification	1 between 2	
Slide **L1**	1 between 2	

Preparation of materials

- Microscope

  Any lenses which are **not** ×10 or ×40 should be removed or replaced.

  For each candidate:
  – the microscope must be set up on low power
  – the slide must **not** be on the stage of the microscope.

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Supervisor's report

Syllabus and component number	9	7	0	0	/	3	7

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:
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- any difficulties experienced by candidates, e.g. due to faulty materials or apparatus
- any specific assistance given to candidates.

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Temperature of exam room ..... °C

Diameter of potato cylinders = ... mm

Results for Question **1(a)(v)**

Declaration

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- the supervisor's reports relevant to these candidates
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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) .....

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Cambridge Assessment International Education

Cambridge International AS & A Level

BIOLOGY **9700/38**

Paper 3 Advanced Practical Skills 2 **May/June 2025**

CONFIDENTIAL INSTRUCTIONS

7987428651

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INSTRUCTIONS

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  email info@cambridgeinternational.org
  phone +44 1223 553554

DC (KAS) 357157
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[Turn over

General information about practical exams

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

Safety

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C	corrosive	**MH**	moderate hazard
HH	health hazard	**T**	acutely toxic
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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

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- 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.
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- 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.

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- 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.

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Specific information for this practical exam

During the exam, the supervisor or other competent biologist (**not** the invigilator) should obtain the results needed for the supervisor's report by following the relevant steps in the question paper. The results should be recorded in the supervisor's report.

Organisation of the exam

- All candidates must have access to the materials required for Question 1 throughout the whole period of the exam.
- Half of the candidates will have access to the microscope and slide for a maximum time of one hour from the start of the exam. These candidates should start with Question 2. After one hour, or sooner if candidates have finished Question 2, they should move on to Question 1.
- For Question 2, two candidates are **not** permitted to share the same microscope and slide at the same time.
- The other candidates should start with Question 1. After one hour, these candidates should be given access to the microscope and slide. They should then move on to Question 2 as soon as they are ready.
- Candidates will only have access to the microscope and slide for one hour. They should be advised that they can answer any part of the exam paper not requiring the microscope and slide throughout the whole period of the exam.
- Access arrangements to microscopes and slides, including instructions on which question to start with and timings, must be explained to candidates before the start of the exam.

Materials to be supplied by Cambridge International

- Slide **M1**

On receipt of the slides, check that they are labelled **M1** and that no slides are broken. The slides must **not** be viewed in advance of the exam. The material on the slides is confidential and must **not** be disclosed to candidates.

The number of slides supplied by Cambridge International will be equal to half the candidate entry.

Return of slides to Cambridge International

Immediately after the exam, the slides must be:

- returned to Cambridge International in the boxes in which they were received, using the self-adhesive label supplied. The slides must **not** be included in the packet of scripts.

or

- purchased using the order form enclosed with the slides, which should be completed and returned to Cambridge International. The order form must **not** be included in the packet of scripts. Slides and boxes will be charged at the rate of £3.25 per slide plus £1 per box.

If the slides are **not** returned or purchased by the deadline stated on the order form, the charge will be £3.75 per slide plus £1 per box.

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Materials and apparatus for Question 1

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
3.0% yeast suspension in a beaker, labelled **Y** (see **Preparation of materials**)	at least 20 cm^3	
[MH] 1.5% (5 vols) hydrogen peroxide in a beaker, labelled **H**	at least 20 cm^3	
[MH] 1.0% copper sulfate in a beaker, labelled **C** (see **Preparation of materials**)	at least 30 cm^3	
[MH] 0.2% copper sulfate in a beaker, labelled **R** (see **Preparation of materials**)	at least 20 cm^3	
[MH][N] 1.0% potassium manganate(VII) in a beaker, labelled **P** (see **Preparation of materials**)	at least 30 cm^3	
[MH] 1.0 $mol\,dm^{-3}$ sulfuric acid in a beaker, labelled **A**	at least 30 cm^3	
Distilled water in a beaker, labelled **W**	at least 150 cm^3	
10 cm^3 syringes	2	
5 cm^3 syringe	1	
1 cm^3 or 2 cm^3 syringe, labelled **P**	1	
1 cm^3 syringes	3	
Beakers, capacity 25–50 cm^3	5	
Test-tubes, large, capacity 40–55 cm^3	6	
Test-tube rack to hold 6 large test-tubes	1	
White card, approximately 10 cm × 10 cm	1	
Container with approximately 200 cm^3 of tap water, labelled **For washing**	1	
Container, capacity approximately 400 cm^3, labelled **For waste**	1	
Paper towels	8	
Marker pen, permanent	1	
Stop-clock or timer, showing seconds	1	
Suitable eye protection	1	
Disposable gloves	1 pair	

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Preparation of materials

Y must be prepared approximately one hour before the exam and kept at room temperature. The dried yeast must be suitable for use in baking.

All other materials may be prepared the day before the exam.

Each solution should be kept in a covered container in a refrigerator. Solutions should be at room temperature before the start of the exam.

- **Y**, 3.0% yeast suspension

  This is prepared by putting 3 g of dried yeast into 50 cm^3 of warm distilled water (approximately 30 °C) and making up to 100 cm^3 with warm distilled water. Stir well.

  Stir well before **Y** is put into the beakers used by the candidates.

- **C**, 1.0% copper sulfate solution

  This is prepared by putting 1 g of copper sulfate pentahydrate ($CuSO_4 \cdot 5H_2O$) **[MH][N][C]** into 80 cm^3 of distilled water and making up to 100 cm^3 with distilled water. Mix well.

- **R**, 0.2% copper sulfate solution

  This is prepared by putting 20 cm^3 of **C** in a beaker and making up to 100 cm^3 with distilled water. Mix well.

[MH] [N]

- **P**, 1.0% potassium manganate(VII) solution

  This is prepared by putting 1 g of potassium manganate(VII) **[O][MH][HH][N]** into 80 cm^3 of distilled water in a beaker and making up to 100 cm^3 with distilled water. Mix well.

  Potassium manganate(VII) is also known as potassium permanganate.

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Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Microscope with: • an eyepiece lens, ×10 magnification • a low-power objective lens, ×10 magnification • a high-power objective lens, ×40 magnification	1 between 2	
Slide **M1**	1 between 2	

Preparation of materials

- Microscope

  Any lenses which are **not** ×10 or ×40 should be removed or replaced.

  For each candidate:
  – the microscope must be set up on low power
  – the slide must **not** be on the stage of the microscope.

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Supervisor's report

Syllabus and component number	9	7	0	0	/	3	8
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.

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Temperature of exam room ..... °C

Results for Question **1(a)(ii)**

Results for Question **1(a)(v)**

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) .....

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