Cambridge Assessment International Education

Cambridge International AS & A Level

BIOLOGY **9700/31**

Paper 3 Advanced Practical Skills 1 **May/June 2024**

CONFIDENTIAL INSTRUCTIONS

5990406194

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. Any blank pages are indicated.

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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

- 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.
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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:
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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.

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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 2 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 1. After one hour, or sooner if candidates have finished Question 1, they should move on to Question 2.
- For Question 1, two candidates are **not** permitted to share the same microscope at the same time.
- The other candidates should start with Question 2. After one hour, these candidates should be given access to the microscope. They should then move on to Question 1 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 throughout the whole period of the exam.
- Access arrangements to microscopes, 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

- None

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Materials and apparatus for Question 1

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	
Onion tissue covered by 1.0 mol dm^{-3} sodium chloride solution, in a beaker, labelled **U1**, provided at room temperature (see **Preparation of materials**)	2 pieces in at least 50 cm^3	
Onion tissue covered by 0.5 mol dm^{-3} sodium chloride solution, in a beaker, labelled **U3**, provided at room temperature (see **Preparation of materials**)	2 pieces in at least 50 cm^3	
Onion tissue covered by distilled water, in a beaker, labelled **U2**, provided at room temperature (see **Preparation of materials**) Note: This item is described differently in the question paper. This is intentional. Candidates should **not** be informed.	2 pieces in at least 50 cm^3	
Microscope slides and coverslips	3	
Teat pipette	1	
200 cm^3 distilled water, in a beaker labelled **For washing** (also used in Question 2)	1	
Container, capacity approximately 200 cm^3, labelled **For waste** (also used in Question 2)	1	
White tile	1	
Mounted needle	1	
Blunt forceps	1	
Scalpel or single-edged razor blade	1	
Marker pen, permanent (also used in Question 2)	1	
Paper towels	8	

Preparation of materials

The sodium chloride solutions may be prepared the day before the examination and kept covered to prevent evaporation.

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

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- 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
  – slides must **not** be left on the stage of the microscope.

- **U1**, 1.0 mol dm^{-3} sodium chloride solution

  This is prepared by putting 5.8 g of sodium chloride in 50 cm^3 of distilled water and mixing well. Make up to 100 cm^3 with distilled water.

  This solution is needed to soak the pieces of onion.

  The 1.0 mol dm^{-3} sodium chloride solution is also used as a stock solution to make **U3**.

- **U3**, 0.5 mol dm^{-3} sodium chloride solution

  This is prepared by adding 50 cm^3 of distilled water to 50 cm^3 of the 1.0 mol dm^{-3} sodium chloride solution. Mix well.

  This solution is needed to soak the pieces of onion.

- Pieces of onion tissue

  The onions must be as fresh as possible to avoid the effects of storage.
  The pieces of onion should be prepared at least one hour before the start of the examination and left in the sodium chloride solutions in covered containers to prevent evaporation.

  Two pieces of onion need to be placed in each of the solutions **U1**, **U2** and **U3**. Make sure the pieces of onion are completely covered by the solutions.

  Onion pieces are prepared as shown in Fig. 1.1.

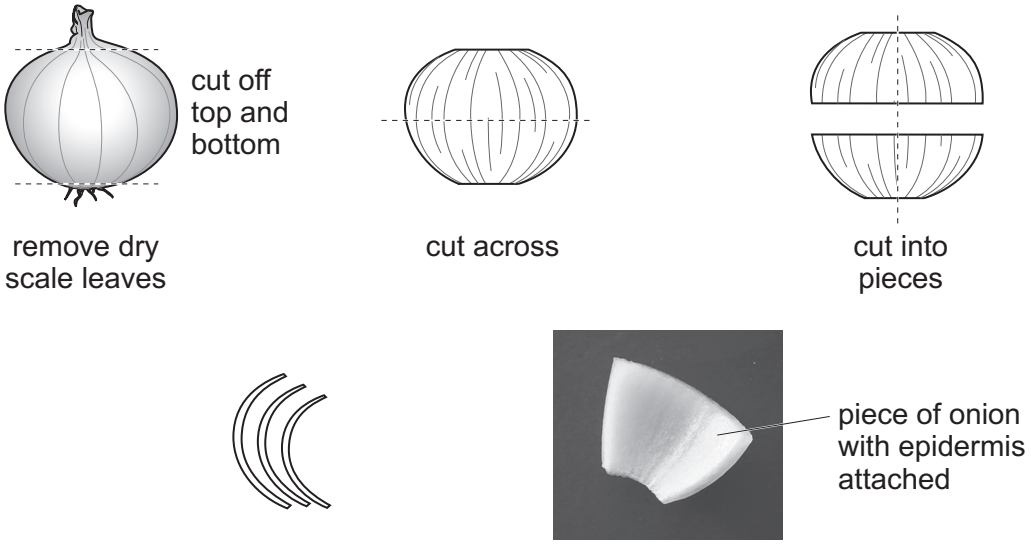


Fig. 1.1

Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
1.0% starch suspension, in a beaker, labelled **R1**, provided at room temperature (see **Preparation of materials**)	at least 20 cm^3	
1.0% starch suspension, in a beaker, labelled **S**, provided at room temperature (see **Preparation of materials**)	at least 50 cm^3	
Iodine solution, in a beaker, labelled **iodine**, provided at room temperature and kept out of direct sunlight, with a dropping pipette (see **Preparation of materials**)	at least 20 cm^3	
Distilled water, in a beaker, labelled **R2**, provided at room temperature	at least 20 cm^3	
Distilled water, in a beaker, labelled **W**, provided at room temperature	at least 150 cm^3	
10 cm^3 syringes	2	
5 cm^3 syringe	1	
1 cm^3 syringe	1	
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	
Glass rod	1	
White card (approximately 10 cm × 10 cm)	1	
200 cm^3 distilled water, in a beaker labelled **For washing** (also used in Question 1)	1	
Container, capacity approximately 200 cm^3, labelled **For waste** (also used in Question 1)	1	
Paper towels	8	
Marker pen, permanent (also used in Question 1)	1	
Suitable eye protection	1	

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Preparation of materials

R1, **S** and the **stock** solution of iodine (0.1 mol dm^{-3}) may be prepared the day before the exam. Each solution should be kept in a covered container in a refrigerator overnight.

The 0.01 mol dm^{-3} **iodine** solution must be prepared no more than **one hour** before the start of the exam.

R1 and **S** should be at room temperature before the start of the exam.

- **R1** and **S**, 1.0% starch suspension

  These are prepared by putting 1 g of **soluble** starch into a small volume of distilled water and mixing to make a paste. Make up to 100 cm^3 with hot distilled water. Heat the suspension to dissolve the starch, mixing well.

  These starch suspensions must be at room temperature for the exam.

- **iodine**, 0.01 mol dm^{-3} iodine in potassium iodide solution

  This is prepared by making a 0.1 mol dm^{-3} stock solution of iodine, then diluting it to make the 0.01 mol dm^{-3} solution:
  - Put 8.0 g of potassium iodide in a beaker or container.
  - Add 2 cm^3 of distilled water to moisten the potassium iodide.
  - Add 2.5 g of iodine **[MH][N]** (if necessary, crush to small pieces) to the moist potassium iodide.
  - Add 15 cm^3 of distilled water and stir well.
  - When no more iodine dissolves, add another 15 cm^3 of distilled water and stir well.
  - Repeat with two more volumes of 15 cm^3 of distilled water and then make up to a total volume of 100 cm^3. It is not essential that all the iodine dissolves.
    This gives a red-brown coloured 0.1 mol dm^{-3} iodine solution.
  - Put 10 cm^3 of the 0.1 mol dm^{-3} iodine solution into a beaker or container.
  - Make up to 100 cm^3 with distilled water. Mix well.

  This makes the 0.01 mol dm^{-3} iodine solution and is a yellow-orange colour.

  Prepare the 0.01 mol dm^{-3} iodine solution no more than **one hour** before the exam.

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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:
- 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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[Turn over

Temperature of exam room .....°C

Results for Question **2(b)(ii)**

Results for Question **2(b)(iv)**

Declaration

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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 2024**

CONFIDENTIAL INSTRUCTIONS

9148803518

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[Turn over

General information about practical exams

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Safety

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C	corrosive	**MH**	moderate hazard
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Materials to be supplied by Cambridge International

- Slide **K1**

On receipt of the slides, check that they are labelled **K1** 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% protease solution, in a beaker labelled **P** (see **Preparation of materials**)	at least 50 cm^3	
Milk, in a beaker, labelled **M** (see **Preparation of materials**)	at least 30 cm^3	
Fruit extract, in a beaker, labelled **U** (see **Preparation of materials**)	at least 20 cm^3	
Distilled water, in a beaker or container, labelled **W**, provided at room temperature	at least 100 cm^3	
Black card, approximately 10 cm × 5 cm	1	
10 cm^3 syringes	2	
5 cm^3 syringe	1	
1 cm^3 syringe	1	
Beakers, capacity 50–100 cm^3	5	
Test-tubes, small, capacity 20–30 cm^3	12	
Test-tube racks to hold 12 small test-tubes	1 or 2	
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	
Glass rod	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.

- **P**, 100% protease solution

  This is prepared by cutting up 250 g of fresh, raw pineapple, including any skin and core, then blending to a fine paste with 100 cm^3 distilled water. Strain through a fine mesh, such as muslin, before use. Stir before dispensing for candidates. This should be prepared immediately before the exam.

  If fresh pineapple is not available, use an alternative source of the enzyme, such as kiwi fruit. Blend the whole fruit, including seeds and skin.

  Fruit should be as **unripe** as possible.

- **U**, fruit extract

  This is prepared by stirring the 100% protease solution, **P**, and adding 60 cm^3 of **P** to 80 cm^3 distilled water. Mix well.

- **M**, milk

  Any type of animal milk can be used. The milk must be at room temperature before the start of the exam.

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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Temperature of exam room ..... °C

Fruit used for enzyme extract .....

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

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

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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 2024**

CONFIDENTIAL INSTRUCTIONS

2832993869

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Materials to be supplied by Cambridge International

- Slide **L1**

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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	✓
[F][MH][HH] 99% ethanol in a beaker, labelled **E**, provided at room temperature	at least 50 cm^3	
0.0005 mol dm^{-3} calcium chloride solution, in a beaker, labelled **A**, provided at room temperature (see **Preparation of materials**)	at least 15 cm^3	
Distilled water in a beaker, labelled **W**, provided at room temperature	at least 150 cm^3	
Dried yeast in a 250 cm^3 beaker, labelled **Y**	approximately 10 g	
10 cm^3 syringes	2	
5 cm^3 syringe	1	
1 cm^3 syringe	1	
Beakers, capacity 50–100 cm^3	5	
Test-tubes, small, capacity 20–30 cm^3	6	
Test-tube rack, to hold 6 test-tubes	1	
Bung to fit small test-tubes	1	
Measuring cylinder, 100 cm^3	1	
Glass rod	1	
Container with approximately 200 cm^3 tap water, labelled **For washing**	1	
Container, capacity approximately 200 cm^3, labelled **For waste**	1	
Ruler in mm	1	
Paper towels	8	
Glass marker pen (permanent)	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.

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

- **A**, 0.0005 mol dm^{-3} calcium chloride solution

  This is prepared by putting 1.1 g of calcium chloride hexahydrate ($CaCl_2 \cdot 6H_2O$) **[MH]** into 500 cm^3 of distilled water in a beaker. Make up to 1000 cm^3 with distilled water. This is the stock solution of 0.005 mol dm^{-3}. Mix well.
  Put 10 cm^3 of the stock solution into a beaker and make up to 100 cm^3 with distilled water.

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	3
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)(iii)**

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 **9700/34**

Paper 3 Advanced Practical Skills 2 **May/June 2024**

CONFIDENTIAL INSTRUCTIONS

3001223054

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

- 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	✓
500 mg dm^{-3} salicylic acid, in a beaker, labelled **A**, provided at room temperature (see **Preparation of materials**) Note: This item is described differently in the question paper. This is intentional. Candidates should **not** be informed.	at least 50 cm^3	
1.0% iron(III) chloride, in a beaker, labelled **C**, provided at room temperature (see **Preparation of materials**)	at least 30 cm^3	
Distilled water, in a beaker, labelled **W**, provided at room temperature	at least 50 cm^3	
25 mg dm^{-3} salicylic acid, in a beaker, labelled **S1**, provided at room temperature (see **Preparation of materials**)	at least 20 cm^3	
250 mg dm^{-3} salicylic acid, in a beaker, labelled **S2**, provided at room temperature (see **Preparation of materials**)	at least 20 cm^3	
10 cm^3 syringes	2	
5 cm^3 syringe	1	
Beakers, capacity 50–100 cm^3	6	
Test-tubes, small, capacity 20–30 cm^3	7	
Test-tube rack, to hold 7 small test-tubes	1	
Glass rod	1	
Container, with approximately 200 cm^3 of tap water, labelled **For washing**	1	
Container, capacity at least 400 cm^3, labelled **For waste**	1	
White card, approximately 10 cm × 10 cm	1	
Paper towels	8	
Glass marker pen, permanent	1	
Suitable eye protection	1	

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Preparation of materials

All the 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.

- **A**, 500 mg dm^{-3} salicylic acid

  This is prepared by putting 0.5 g of salicylic acid into 500 cm^3 of distilled water. Mix well. Salicylic acid does not dissolve easily, so this will take some time.

  Make up to 1000 cm^3 with distilled water. Mix well.

- **S1**, 25 mg dm^{-3} salicylic acid

  Put 5 cm^3 of **A** into a beaker. Make up to 100 cm^3 with distilled water.

- **S2**, 250 mg dm^{-3} salicylic acid

  Put 50 cm^3 of **A** into a beaker. Make up to 100 cm^3 with distilled water.

[MH] ● **C**, 1.0% iron(III) chloride

  This is prepared by putting 2.7 g of iron(III) chloride hexahydrate **[MH][C]** into approximately 75 cm^3 of 1.0 mol dm^{-3} hydrochloric acid in a beaker. Stir to dissolve. Do **not** warm the solution.

  Make up to 100 cm^3 with 1.0 mol dm^{-3} hydrochloric acid. Mix well.

  Put 40 cm^3 of this solution into a beaker. Make up to 100 cm^3 with 0.2 mol dm^{-3} hydrochloric acid. Mix well.

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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 **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).

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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 **9700/35**

Paper 3 Advanced Practical Skills 1 **May/June 2024**

CONFIDENTIAL INSTRUCTIONS

4678874889

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[Turn over

General information about practical exams

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  - the supervisor's reports relevant to these candidates
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  - the attendance register.

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Specific information for this practical exam

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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 **N1**

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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	✓
4 cm cylinders of beetroot covered by distilled water, in a beaker labelled **B** (see **Preparation of materials**)	4	
[F][MH][HH] 50% ethanol, in a beaker labelled **E**	at least 100 cm^3	
Distilled water, in a beaker or container, labelled **W**, provided at room temperature	at least 300 cm^3	
10 cm^3 syringes	2	
Beakers, capacity 50–100 cm^3	7	
Test-tubes, large, capacity 40–55 cm^3	6	
Test-tubes, small, capacity 20–30 cm^3	6	
Test-tube rack, to hold 6 large test-tubes and 6 small test-tubes	1	
Glass rod	1	
White card, approximately 10 cm × 10 cm	1	
Container with approximately 200 cm^3 tap water, labelled **For washing**	1	
Container, capacity approximately 300 cm^3, labelled **For waste**	1	
White tile	1	
Sharp blade or scalpel or knife	1	
Blunt forceps	1	
Ruler, with mm	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 beetroot should be prepared the day before the exam and kept in a covered container in a refrigerator.

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

- **B**, pieces of beetroot, in water, in a beaker or container with a suitable cover to prevent evaporation.

  The plant tissue you may use is any purple variety of beetroot, *Beta vulgaris*.

  The beetroot should be uncooked and as fresh as possible to avoid the effects of storage.

  Four cylinders of beetroot are needed per candidate.

  To prepare the beetroot:
  – use a cork borer with a diameter of 8–10 mm to cut cylinders of beetroot 30–40 mm long
  – remove the outer skin at each end of the cylinders
  – put the prepared beetroot cylinders into a beaker or container and cover with water
  – change the water several times to remove as much of the pigment as possible
  – leave the beetroot cylinders soaking in the water overnight
  – before the exam, change the water several times
  – for each candidate put 4 of the cylinders into a small beaker covered 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 **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:
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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

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

Declaration

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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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