Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/31**

Advanced Practical Skills 1 **October/November 2015**

CONFIDENTIAL INSTRUCTIONS

Great care should be taken to ensure that any confidential information given, including the identity of material on microscope slides where appropriate, does not reach the candidates either directly or indirectly.

7468335912

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: info@cie.org.uk
by phone: +44 1223 553554
by fax: +44 1223 553558
stating the Centre number, the nature of the query and the syllabus number quoted above.

This document consists of **8** printed pages.

DC (NH) 88804/3
© UCLES 2015

CAMBRIDGE International Examinations

[Turn over

Instructions for preparing apparatus

These instructions give details of the apparatus required by each candidate for each experiment in this paper. A summary of the questions that will be presented to the candidates is included, where appropriate, to allow the biology teacher to test the apparatus appropriately.
No access to the Question Paper is permitted in advance of the examination.

If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Supervisor's Report.

Candidates must be provided with a microscope with:

- Eyepiece lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- Low-power objective lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- High-power objective lens, ×40 (equal to 4 mm or $\frac{1}{6}''$)
- Eyepiece graticule fitted within the eyepiece and visible in focus at the same time as the specimen.

To avoid confusion, Cambridge request that only the lenses specified above are fitted in the microscopes to be used in the examination. Any lenses which are **not** ×10 or ×40 should be removed or replaced.

Each candidate must have uninterrupted use of the microscope for at least one hour.

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Pipette fillers and safety goggles should be used where necessary.

In accordance with the COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

The following codes are used where relevant.

C = corrosive substance

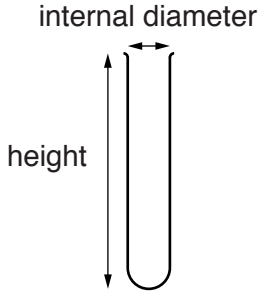
F = highly flammable substance

H = harmful or irritating substance

O = oxidising substance

T = toxic substance

N = harmful to environment



When small test-tubes are provided, it is expected that these are approximately 150 mm in height.

If other dimensions of apparatus are required, these will be specified in the Apparatus list.

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres should also refer to the Handbook for Centres.

If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to resolve, it is essential for Centres to contact the Product Manager as soon as possible by **e-mail** to info@cie.org.uk, by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

© UCLES 2015

Confidential Instructions

No access to the Question Paper is permitted in advance of the examination.

Each candidate will require:

For both Questions:

- mm ruler.

Question 1

- Solutions and materials provided to the candidates should be supplied in a suitable beaker, or container, for removal of the solution using a syringe. More of the solutions and materials should be available if requested by candidates.
- All solutions should be provided to candidates at **room temperature**.
- Clean, dry test-tubes and syringes are needed for each candidate.
- Fresh **S**, **W**, **P**, **tap water** and **washing water** are needed for each candidate.
- All solutions should be disposed of according to local safety regulations.

Plant tissue must be prepared the day before the examination

Summary of solutions and materials:

labelled	contents	hazard	volume /cm^3
S	10% sodium chloride solution	none	at least 50
W	distilled water	none	at least 200

Materials:

labelled	contents	hazard	details	quantity
P	plant tissue stained with methylene blue solution	none	see instructions	5
methylene blue	0.1% methylene blue solution used to stain plant tissue	stains	–	–

It is advisable to wear safety glasses/goggles and gloves when handling chemicals.

Preparation of solutions and materials:

(i) **S**, at least 50 cm^3 of 10% sodium chloride solution, in a beaker or container, labelled **S**.

This is prepared by dissolving 10 g of sodium chloride in 100 cm^3 of distilled water in a beaker or container and stirring well.

This may be prepared the day before but should be kept in covered containers in a refrigerator. However, **S** should be supplied to candidates at **room temperature** for the examination.

(ii) **W**, at least 200 cm^3 of distilled water in a beaker or container, labelled **W**.

(iii) **P**, five pieces of plant tissue, in water, in a beaker or container with a suitable cover to prevent evaporation, labelled **P**.

Plant tissue must be prepared the day before the examination.

Suitable plant tissue is white potato (e.g. Irish).

The plant tissue should be as fresh as possible. The plant tissue should not have been stored or refrigerated for a long period of time.

The outer skin should be removed before cutting the plant tissue into pieces.

Each piece should have the same cross-sectional area, 0.5 cm × 0.5 cm.
Length should be between 3–4 cm.

Slices of plant tissue can be cut with a large kitchen knife and strips produced using a scalpel. Please do not use cork borers as this may compress the tissues.

The test-tubes provided must be large enough to allow the pieces of plant tissue to fit.

Put the prepared plant tissue into a shallow tray so that the pieces do not overlap and cover them with **freshly** prepared 0.1% methylene blue solution.

This is prepared by dissolving 0.1 g of methylene blue in 80 cm^3 of distilled water in a beaker or container and making up to 100 cm^3 with distilled water.

If any methylene blue comes into contact with your skin wash off it immediately with water.

Before the examination wash the pieces of plant tissue as follows:

- pour off the methylene blue solution
- add tap water to cover the pieces
- pour off the water and then add fresh tap water
- repeat four times.

Add enough fresh tap water to cover the plant tissue ready to put out for the candidate in a beaker or container, labelled **P**. The tap water in **P** may still be blue.

Cover the beaker or container **P** to prevent evaporation.

© UCLES 2015

Apparatus for each candidate should be clean.
Syringe needles are **not** required and must **not** be given to candidates.

Apparatus for each candidate	Quantity	✓
10 cm^3 syringe, with the means to wash it out	2	
Beaker or container (capacity approximately 200 cm^3), containing approximately 150 cm^3 tap water, labelled **For washing**	1	
Beaker or container (capacity approximately 400 cm^3), containing approximately 300 cm^3 tap water for pouring into test-tubes, labelled **Tap water**	1	
Beaker or container (capacity approximately 400 cm^3), labelled **For waste**	2	
Paper towels	8	
Beaker or container, to hold 50 cm^3	5	
Beaker or container, to hold 50 cm^3, labelled **R**	1	
Test-tubes, to hold more than 25 cm^3 but no more than 50 cm^3	6	
Test-tube rack(s), to hold 6 test-tubes **or** to hold 5 test-tubes and a container to hold 1 test-tube	1	
Blunt forceps	1	
Scalpel blade or sharp blade	1	
Stop clock or timer showing seconds	1	
White card (approximately 10 cm × 10 cm)	1	
White tile or other suitable surface for cutting	1	
Glass marker pen	1	
Safety glasses/goggles	1	

During the examination, the Supervisor (**not** the Invigilator) should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and materials as the candidates, in order to obtain results for **Q1(a)(iii)**. The results should be written in the Supervisor's Report, on page 8, **not** on a spare question paper.

The Supervisor's Report and the candidates' seating plan should be enclosed with the candidates' scripts.

Please ensure that, if the scripts are in several packets, a copy of the Supervisor's Report and the candidates' seating plan are enclosed with each packet of scripts.

The Invigilator should **not** carry out **Question 1**.

© UCLES 2015

[Turn over

Question 2

(i) Slide **J1** (supplied by Cambridge).

On receipt of the slides, please check that they are labelled **J1** and that none of the slides are broken. The material is **confidential** (so **must not** be disclosed to candidates) and the slides should **not** be viewed in advance of the examination.

The number of slides supplied by Cambridge will be equal to half the candidate entry. Therefore, half the candidates should start on **Question 2** and the other half should start on **Question 1**.

(ii) Microscope as described on page 2.

For each candidate:

- the microscope must be set up on low power
- the slide must **not** be on the stage of the microscope.

MATERIALS TO BE SUPPLIED BY CAMBRIDGE

(i) Question papers.

(ii) Slide **J1**.

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

Immediately after the examination the microscope slides **must** be:

- returned to Cambridge in the containers in which they were received, using the self-adhesive label. 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. The order form must **not** be included in the packet of scripts.

Slides and boxes will be charged at the rate of £3 per slide and £1 per box.

If the items are not returned or purchased by the deadline stated on the order form they will be charged at £3.50 per slide plus £1 per box.

SUPERVISOR'S REPORT and SEATING PLAN

The teacher responsible for the examination is asked to fill in the Supervisor's Report in these Confidential Instructions.

For Centres where more than one script packet is used, there must be a copy of the completed Supervisor's Report and the candidates' seating plan in each script packet. These Supervisors' Reports are essential in order to allow the Examiner to assess all candidates as fairly as possible and should always be completed by every Centre.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2015

This form should be completed and sent to the Examiner with the scripts

SUPERVISOR'S REPORT

October/November 2015

The Supervisor or Teacher responsible for the subject should provide the following information.

1. Was any difficulty experienced in providing the necessary materials? If so, give brief details.

2. Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

(a) difficulties arising from faulty specimens or microscopes;

(b) accidents to apparatus or materials;

(c) assistance provided in case of colour-blindness;

(d) any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

All other cases of individual hardship, e.g. illness or disability, should be reported direct to CIE on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

3. During the examination, the Supervisor should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and materials as the candidates. The results for **Question 1(a)(iii)** should be written in the Supervisor's Report, which should be enclosed with the candidates' scripts. If the scripts are in several packets, please ensure that a copy of the Supervisor's Report is enclosed with each packet of scripts. The Invigilator should **not** carry out **Question 1**.

4. Enclose a **seating plan** of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for **each question**. Use **separate** paper for this.

Declaration (to be signed by the Principal or the Examinations Officer)

The preparation of this practical examination has been carried out so as to maintain the security of the examination.

Signed .....

Name (in block capitals) .....

Centre number (of enclosed scripts) .....

Centre name .....

If scripts are required by CIE to be despatched in more than one envelope, it is essential that a copy of the

- relevant Supervisor's Report
- appropriate seating plan(s) are sent inside **each envelope**.

© UCLES 2015

[Turn over

Temperature of examination room ..... °C

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

Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/33**

Advanced Practical Skills 1 **October/November 2015**

CONFIDENTIAL INSTRUCTIONS

Great care should be taken to ensure that any confidential information given, including the identity of material on microscope slides where appropriate, does not reach the candidates either directly or indirectly.

5521537028

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: info@cie.org.uk
by phone: +44 1223 553554
by fax: +44 1223 553558
stating the Centre number, the nature of the query and the syllabus number quoted above.

This document consists of **8** printed pages.

DC (NH) 88806/4
© UCLES 2015

CAMBRIDGE International Examinations

[Turn over

Instructions for preparing apparatus

These instructions give details of the apparatus required by each candidate for each experiment in this paper. A summary of the questions that will be presented to the candidates is included, where appropriate, to allow the biology teacher to test the apparatus appropriately.
No access to the Question Paper is permitted in advance of the examination.

If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Supervisor's Report.

Candidates must be provided with a microscope with:

- Eyepiece lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- Low-power objective lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- High-power objective lens, ×40 (equal to 4 mm or $\frac{1}{6}''$)
- Eyepiece graticule fitted within the eyepiece and visible in focus at the same time as the specimen.

To avoid confusion, Cambridge request that only the lenses specified above are fitted in the microscopes to be used in the examination. Any lenses which are **not** ×10 or ×40 should be removed or replaced.

Each candidate must have uninterrupted use of the microscope for at least one hour.

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Pipette fillers and safety goggles should be used where necessary.

In accordance with the COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

The following codes are used where relevant.

C = corrosive substance

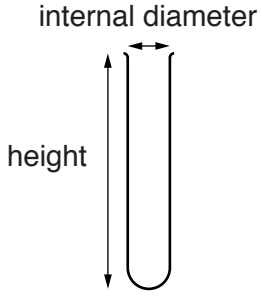
F = highly flammable substance

H = harmful or irritating substance

O = oxidising substance

T = toxic substance

N = harmful to environment



When small test-tubes are provided, it is expected that these are approximately 150 mm in height.

If other dimensions of apparatus are required, these will be specified in the Apparatus list.

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres should also refer to the Handbook for Centres.

If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to resolve, it is essential for Centres to contact the Product Manager as soon as possible by **e-mail** to info@cie.org.uk, by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

© UCLES 2015

Confidential Instructions

No access to the Question Paper is permitted in advance of the examination.

Each candidate will require:

For both Questions:

- mm ruler.

Question 1

- Solutions provided to the candidates should be supplied in a suitable beaker, or container, for removal of the solution using a syringe. More of the solutions should be available if requested by candidates.
- All solutions should be provided to candidates at **room temperature**.
- Clean, dry test-tubes and syringes are needed for each candidate.
- Fresh **S**, **Y**, **W** and **H** are needed for each candidate.
- All solutions should be disposed of according to local safety regulations.

Yeast

It is essential to try the yeast well **before** the examination to make sure that it will become active.

Test the activity of the yeast and hydrogen peroxide solution:

Put 5 cm^3 of **H** into a test-tube and add 1 cm^3 of **Y**. The mixture should foam up with froth on the top, within a few seconds, showing it is active.

If it is not active then increase the concentration of or replace the hydrogen peroxide or change the source of the yeast.

Some types of yeast will require more time, after the glucose is added, to become active.

Do **not** use Brewer's yeast as this does not always work actively enough in the time.

Summary of solutions:

labelled	**contents**	**hazard**	**volume /cm^3**
S	10% sodium chloride solution	none	at least 60
Y	active yeast cell suspension	none	at least 60
W	distilled water	none	at least 60
H	hydrogen peroxide solution	**[H]** harmful **[H]** irritant	at least 60

It is advisable to wear safety glasses/goggles when handling chemicals.

© UCLES 2015

Preparation of solutions:

Sodium chloride solution may be prepared the day before but should be kept in covered containers in a refrigerator. However, the sodium chloride solution should be supplied to candidates at **room temperature** for the examination.

(i) **S**, at least 60 cm^3 of 10% sodium chloride solution, in a beaker or container labelled **S**.

This is prepared by dissolving 10 g of sodium chloride in 100 cm^3 of distilled water in a beaker or container and stirring well.

(ii) **Y**, at least 60 cm^3 of 7.0% yeast cell suspension, in a beaker or container labelled **Y**. This volume should not include any froth.

Y should be prepared one hour before the candidates start **Question 1**. In a large container put 7.0 g of dried yeast (for baking) into 40 cm^3 of warm distilled water. Stir and make up to 100 cm^3 with warm distilled water. This should be kept for approximately 30 minutes at a temperature of 35 °C to 40 °C.
Approximately 15 minutes before the candidates start **Question 1**, sprinkle 20 g of glucose over the surface of the suspension and stir thoroughly and keep at a temperature of 35 °C to 40 °C.

To help put the 60 cm^3 of **Y** into the beaker for the candidates, it is suggested that the yeast cell suspension is poured into a second beaker leaving the froth behind.

(iii) **W**, at least 60 cm^3 of distilled water in a beaker or container, labelled **W**.

[H] (iv) **H**, at least 60 cm^3 of 10 vols (3%) hydrogen peroxide solution, in a beaker or container labelled **H**.

The beaker should be covered to prevent evaporation and should be put out just before the candidates start **Question 1**.

© UCLES 2015

Apparatus for each candidate should be clean.
Syringe needles are **not** required and must **not** be given to candidates.

Apparatus for each candidate	Quantity	✓
10 cm^3 syringe, with the means to wash it out	2	
2 cm^3 or 3 cm^3 or 5 cm^3 syringe, with the means to wash it out	1	
Beaker or container (capacity approximately 400 cm^3), containing approximately 300 cm^3 tap water for pouring into test-tubes, labelled **For washing**	1	
Beaker or container (capacity approximately 400 cm^3), labelled **For waste**	1	
Paper towels	8	
Beakers or containers, to hold at least 50 cm^3	6	
Test-tubes, to hold a volume more than 40 cm^3 and less than 50 cm^3	6	
Test-tube rack(s), to hold 6 test-tubes **or** to hold 5 test-tubes and a container to hold 1 test-tube	1	
Glass rod	1	
Thermometer, –10 to 110 °C	1	
Glass marker pen	1	
Safety glasses/goggles	1	

During the examination, the Supervisor (**not** the Invigilator) should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions as the candidates in order to obtain results for **Question 1(b)(ii)**. These results should be written in the Supervisor's Report, on page 8, **not** on a spare question paper.

The Supervisor's Report and the candidates' seating plan should be enclosed with the candidates' scripts.

Please ensure that, if the scripts are in several packets, a copy of the Supervisor's Report and the candidates' seating plan are enclosed with each packet of scripts.

The Invigilator should **not** carry out **Question 1**.

Question 2

(i) Slide **K1** (supplied by Cambridge).

On receipt of the slides, please check that they are labelled **K1** and that none of the slides are broken. The material is **confidential** (so **must not** be disclosed to candidates) and the slides should **not** be viewed in advance of the examination.

The number of slides supplied by Cambridge will be equal to half the candidate entry.
Therefore, half the candidates should start on **Question 2** and the other half should start on **Question 1**.

© UCLES 2015

(ii) Microscope as described on page 2.

For each candidate:

- the microscope must be set up on low power
- the slide must **not** be on the stage of the microscope.

MATERIALS TO BE SUPPLIED BY CAMBRIDGE

(i) Question papers.

(ii) Slide **K1**.

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

Immediately after the examination the microscope slides **must** be:

- returned to Cambridge in the containers in which they were received, using the self-adhesive label. 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. The order form must **not** be included in the packet of scripts.

Slides and boxes will be charged at the rate of £3 per slide and £1 per box.

If the items are not returned or purchased by the deadline stated on the order form they will be charged at £3.50 per slide plus £1 per box.

SUPERVISOR'S REPORT and SEATING PLAN

The teacher responsible for the examination is asked to fill in the Supervisor's Report in these Confidential Instructions.

For Centres where more than one script packet is used, there must be a copy of the completed Supervisor's Report and the candidates' seating plan in each script packet. These Supervisors' Reports are essential in order to allow the Examiner to assess all candidates as fairly as possible and should always be completed by every Centre.

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2015

This form should be completed and sent to the Examiner with the scripts

SUPERVISOR'S REPORT

October/November 2015

The Supervisor or Teacher responsible for the subject should provide the following information.

1. Was any difficulty experienced in providing the necessary materials? If so, give brief details.

2. Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

(a) difficulties arising from faulty specimens or microscopes;

(b) accidents to apparatus or materials;

(c) assistance provided in case of colour-blindness;

(d) any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

All other cases of individual hardship, e.g. illness or disability, should be reported direct to CIE on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

3. During the examination, the Supervisor should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions as the candidates. The results for **Question 1(b)(ii)** should be written in the Supervisor's Report, which should be enclosed with the candidates' scripts. If the scripts are in several packets, please ensure that a copy of the Supervisor's Report is enclosed with each packet of scripts. The Invigilator should **not** carry out **Question 1**.

4. Enclose a **seating plan** of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for **each question**. Use **separate** paper for this.

Declaration (to be signed by the Principal or the Examinations Officer)

The preparation of this practical examination has been carried out so as to maintain the security of the examination.

Signed .....

Name (in block capitals) .....

Centre number (of enclosed scripts) .....

Centre name .....

If scripts are required by CIE to be despatched in more than one envelope, it is essential that a copy of the

- relevant Supervisor's Report
- appropriate seating plan(s) are sent inside **each envelope**.

© UCLES 2015

[Turn over

Temperature of examination room ..... °C

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

© UCLES 2015

Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/34**

Advanced Practical Skills 2 **October/November 2015**

CONFIDENTIAL INSTRUCTIONS

Great care should be taken to ensure that any confidential information given, including the identity of material on microscope slides where appropriate, does not reach the candidates either directly or indirectly.

0140174499

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: info@cie.org.uk
by phone: +44 1223 553554
by fax: +44 1223 553558
stating the Centre number, the nature of the query and the syllabus number quoted above.

This document consists of **8** printed pages.

© UCLES 2015

CAMBRIDGE International Examinations

Instructions for preparing apparatus

These instructions give details of the apparatus required by each candidate for each experiment in this paper. A summary of the questions that will be presented to the candidates is included, where appropriate, to allow the biology teacher to test the apparatus appropriately.
No access to the question paper is permitted in advance of the examination.

If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Supervisor's Report.

Candidates must be provided with a microscope with:

- Eyepiece lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- Low-power objective lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- High-power objective lens, ×40 (equal to 4 mm or $\frac{1}{6}''$)
- Eyepiece graticule fitted within the eyepiece and visible in focus at the same time as the specimen.

To avoid confusion, Cambridge request that only the lenses specified above are fitted in the microscopes to be used in the examination. Any lenses which are **not** ×10 or ×40 should be removed or replaced.

Each candidate must have uninterrupted use of the microscope for at least one hour.

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Pipette fillers and safety goggles should be used where necessary.

In accordance with the COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

The following codes are used where relevant.

C = corrosive substance

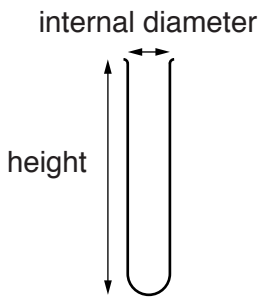
F = highly flammable substance

H = harmful or irritating substance

O = oxidising substance

T = toxic substance

N = harmful to environment



When small test-tubes are provided, it is expected that these are approximately 150 mm in height.

If other dimensions of apparatus are required, these will be specified in the Apparatus list.

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres should also refer to the Handbook for Centres.

If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to resolve, it is essential for Centres to contact the Product Manager as soon as possible by **e-mail** to info@cie.org.uk, by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

© UCLES 2015

Confidential Instructions

No access to the Question Paper is permitted in advance of the examination.

Each candidate will require:

For both Questions:

- mm ruler.

Question 1

- Solutions and materials provided to the candidates should be supplied in a suitable beaker, or container, for removal of the solutions using a syringe. More of the solutions and **P** should be available if requested by candidates.
- All solutions should be provided to candidates at **room temperature**.
- Clean, dry test-tubes and syringes are needed for each candidate.
- Fresh **S**, **P**, **tap water** and **washing water** are needed for each candidate.
- All solutions and materials should be disposed of according to local safety regulations.

Plant tissue must be prepared the day before the examination

Summary of solution and materials:

labelled	contents	hazard	volume / cm^3
S	3% sodium chloride solution	none	at least 250

Materials:

labelled	contents	hazard	details	quantity
P	plant tissue stained with methylene blue solution	none	see instructions	4
methylene blue	0.1% methylene blue solution used to stain plant tissue	stains	–	–

It is advisable to wear safety glasses/goggles when handling chemicals.

© UCLES 2015

Preparation of solution and materials:

(i) **S**, at least 250 cm^3 of 3% sodium chloride solution in a beaker or container, labelled **S**.

This is prepared by dissolving 7.5 g of sodium chloride into approximately 150 cm^3 distilled water and making up to 250 cm^3 with distilled water.

This may be prepared the day before the examination but should be kept in covered containers in a refrigerator. However, it should be supplied to candidates at **room temperature** for the examination.

(ii) **P**, four pieces of plant tissue, in water, in a beaker or container with a suitable cover to prevent evaporation, labelled **P**.

Plant tissue must be prepared the day before the examination.

Suitable plant tissue is white potato (e.g. Irish).

The plant tissue should be as fresh as possible. The plant tissue should not have been stored or refrigerated for a long period of time.

The outer skin should be removed.

Each piece should have the same cross-sectional area, 0.5 cm × 0.5 cm.
Length should be approximately 5 cm.

Slices of plant tissue can be cut with a large kitchen knife and strips produced using a scalpel. Please **do not** use cork borers as this may compress the tissues.

The test-tubes provided must be large enough to allow the pieces to fit.

Put the prepared plant tissue into a shallow tray so that the pieces do not overlap and cover with **freshly** prepared 0.1% methylene blue solution.

This is prepared by dissolving 0.1 g of methylene blue in 80 cm^3 of distilled water in a beaker or container and making up to 100 cm^3 with distilled water.

If any methylene blue comes into contact with your skin wash off immediately with water.

Before the examination wash the pieces of plant tissue as follows:

- pour off the methylene blue solution
- add tap water to cover the pieces
- pour off the water and then add fresh tap water
- repeat four times.

Add enough fresh tap water to cover the plant tissue ready to put out for the candidate in a beaker or container, labelled **P**. The tap water in **P** may still be blue.

Cover the beaker or container **P** to prevent evaporation.

© UCLES 2015

Apparatus for each candidate should be clean.
Syringe needles are **not** required and must **not** be given to candidates.

Apparatus for each candidate	Quantity	✓
10 cm^3 syringe, with the means to wash it out	2	
Beaker or container (capacity approximately 400 cm^3), containing approximately 250 cm^3 tap water, labelled **For washing**	1	
Beaker or container (capacity approximately 400 cm^3), containing approximately 300 cm^3 tap water, labelled **Tap water**	1	
Beaker or container (capacity approximately 400 cm^3), labelled **For waste**	2	
Paper towels	8	
Beaker or container, to hold no more than 100 cm^3, labelled **R**	1	
Test-tubes, to hold more than 25 cm^3 but no more than 50 cm^3	5	
Test-tube rack or container, to hold the 5 test-tubes	1	
Blunt forceps	1	
Glass rod	1	
Scalpel or sharp blade	1	
Stop clock or timer showing seconds	1	
White card (approximately 10 cm × 10 cm)	1	
White tile or other suitable surface for cutting	1	
Glass marker pen	1	
Safety glasses/goggles	1	

During the examination, the Supervisor (**not** the Invigilator) should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and materials as the candidates, in order to obtain results for **Q1(b)(iv)**. These results should be written in the Supervisor's Report, on page 8, **not** on a spare question paper.

The Supervisor's Report and the candidates' seating plan should be enclosed with the candidates' scripts.

Please ensure that, if the scripts are in several packets, a copy of the Supervisor's Report and the candidates' seating plan are enclosed with each packet of scripts.

The Invigilator should **not** carry out **Question 1**.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

© UCLES 2015

Question 2

Each candidate will require:

labelled	contents	hazard	volume / cm^3
W	distilled water	none	at least 10
I	iodine solution	[H] harmful [H] irritant stains	at least 10

Materials:

labelled	contents	hazard	details	quantity
T	potato unstained	none	see instructions	1

(i) **T**, a piece of peeled potato (e.g. Irish) wrapped in a damp paper towel in a covered dish, labelled **T**.
The exact dimensions are not important (e.g. approximately 5 cm × 2 cm × 2 cm).

A fresh potato piece should be provided for each candidate.

(ii) **W**, at least 10 cm^3 of distilled water in a suitable container with a teat pipette, labelled **W**.

[H] (iii) **I**, at least 10 cm^3 of iodine in potassium iodide solution as used for testing for starch, in a suitable container with a teat pipette, labelled **I**.

Apparatus for each candidate should be clean.

Apparatus for each candidate	Quantity	✓
Clean and dry microscope slides with coverslips	2	
Black card approximately 10 cm × 10 cm	1	
Paper towels	8	
Mounted needle	1	
Scalpel or sharp blade	1	
Microscope as described on page 2 For each candidate: • the microscope must be set up on low power • no slides must be on the stage of the microscope.	1	

MATERIALS TO BE SUPPLIED BY CAMBRIDGE

(i) Question papers.
Note: no slide is supplied.

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

There is no material to return to Cambridge.

SUPERVISOR'S REPORT and SEATING PLAN

The teacher responsible for the examination is asked to fill in the Supervisor's Report in these Confidential Instructions.

For Centres where more than one script packet is used, there must be a copy of the completed Supervisor's Report and the candidates' seating plan in each script packet. These Supervisors' Reports are essential in order to allow the Examiner to assess all candidates as fairly as possible and should always be completed by every Centre.

© UCLES 2015

9700/34

This form should be completed and sent to the Examiner with the scripts

SUPERVISOR'S REPORT

October/November 2015

The Supervisor or Teacher responsible for the subject should provide the following information.

1. Was any difficulty experienced in providing the necessary materials? If so, give brief details.

2. Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

(a) difficulties arising from faulty specimens or microscopes;

(b) accidents to apparatus or materials;

(c) assistance provided in case of colour-blindness;

(d) any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

All other cases of individual hardship, e.g. illness or disability, should be reported direct to CIE on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

3. During the examination, the Supervisor should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and reagents as the candidates. The results for **Question 1(b)(iv)** should be written in the Supervisor's Report, which should be enclosed with the candidates' scripts. If the scripts are in several packets, please ensure that a copy of the Supervisor's Report is enclosed with each packet of scripts. The Invigilator should **not** carry out **Question 1**.

4. Enclose a **seating plan** of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for **each question**. Use **separate** paper for this.

Declaration (to be signed by the Principal or the Examinations Officer)

The preparation of this practical examination has been carried out so as to maintain the security of the examination.

Signed .....

Name (in block capitals) .....

Centre number (of enclosed scripts) .....

Centre name .....

If scripts are required by CIE to be despatched in more than one envelope, it is essential that a copy of the

- relevant Supervisor's Report
- appropriate seating plan(s) are sent inside **each envelope**.

© UCLES 2015

[Turn over

Temperature of examination room ..... °C

Results for **Question 1(b)(iv)**

Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/35**

Advanced Practical Skills 1 **October/November 2015**

CONFIDENTIAL INSTRUCTIONS

Great care should be taken to ensure that any confidential information given, including the identity of material on microscope slides where appropriate, does not reach the candidates either directly or indirectly.

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: info@cie.org.uk
by phone: +44 1223 553554
by fax: +44 1223 553558
stating the Centre number, the nature of the query and the syllabus number quoted above.

This document consists of **8** printed pages.

DC (RW) 89000/3
© UCLES 2015

CAMBRIDGE International Examinations

[Turn over

Instructions for preparing apparatus

These instructions give details of the apparatus required by each candidate for each experiment in this paper. A summary of the questions that will be presented to the candidates is included, where appropriate, to allow the biology teacher to test the apparatus appropriately.
No access to the question paper is permitted in advance of the examination.

If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Supervisor's Report.

Candidates must be provided with a microscope with:

- Eyepiece lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- Low-power objective lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- High-power objective lens, ×40 (equal to 4 mm or $\frac{1}{6}''$)
- Eyepiece graticule fitted within the eyepiece and visible in focus at the same time as the specimen.

To avoid confusion, Cambridge request that only the lenses specified above are fitted in the microscopes to be used in the examination. Any lenses which are **not** ×10 or ×40 should be removed or replaced.

Each candidate must have uninterrupted use of the microscope for at least one hour.

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Pipette fillers and safety goggles should be used where necessary.

In accordance with the COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

The following codes are used where relevant.

C = corrosive substance

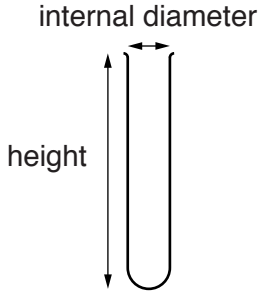
F = highly flammable substance

H = harmful or irritating substance

O = oxidising substance

T = toxic substance

N = harmful to environment



When small test-tubes are provided, it is expected that these are approximately 150 mm in height.

If other dimensions of apparatus are required, these will be specified in the Apparatus list.

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres should also refer to the Handbook for Centres.

If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to resolve, it is essential for Centres to contact the Product Manager as soon as possible by **e-mail** to info@cie.org.uk, by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

© UCLES 2015

Confidential Instructions

No access to the Question Paper is permitted in advance of the examination.

Each candidate will require:

For both Questions:

- mm ruler.

Question 1

- Solutions and materials provided to the candidates should be supplied in a suitable beaker, or container, for removal of the solution using a syringe. More of the solutions and reagents should be available if requested by candidates.
- All solutions and reagents should be provided to candidates at **room temperature**.
- Clean, dry test-tubes and syringes are needed for each candidate.
- Fresh **pH 3, pH 4, pH 6**, **W**, **S1, S2** and **P** are needed for each candidate.
- All solutions and materials should be disposed of according to local safety regulations.

Summary of solutions and materials:

labelled	contents	hazard	concentration	volume / cm^3
pH 3	citric acid/sodium citrate buffer	[H] irritant	see instructions	at least 30
pH 4	citric acid/sodium citrate buffer	[H] irritant	see instructions	at least 30
pH 6	citric acid/sodium citrate buffer	[H] irritant	see instructions	at least 30
S1	citric acid/sodium citrate buffer at pH 5	[H] irritant	see instructions	at least 30
S2	hydrochloric acid	[H] irritant	1 M	at least 30
W	distilled water	none	–	at least 30

Materials:

labelled	contents	hazard	details	quantity
P	red cabbage	none	pieces of leaf	approximately 100 cm^2 in total

It is advisable to wear safety glasses/goggles and gloves when handling chemicals.

© UCLES 2015

Preparation of solutions and materials:

[H] (i) **pH 3**, at least 30 cm^3 of buffer pH 3 in a beaker or container, labelled **pH 3**.

[H] (ii) **pH 4**, at least 30 cm^3 of buffer pH 4 in a beaker or container, labelled **pH 4**.

[H] (iii) **pH 6**, at least 30 cm^3 of buffer pH 6 in a beaker or container, labelled **pH 6**.

[H] (iv) **S1**, at least 30 cm^3 of buffer pH 5 in a beaker or container, labelled **S1**.

[H] (v) **S2**, at least 30 cm^3 of 1 M hydrochloric acid in a beaker or container, labelled **S2**.

(vi) **W**, at least 30 cm^3 of distilled water in a beaker or container, labelled **W**.

The buffers, pH 3, pH 4, S1 (pH 5) and pH 6 should be prepared using the following stock solutions:

1 dm^3 of 0.1 mol dm^{-3} citric acid. This is prepared by dissolving 19.2 g of citric acid in 500 cm^3 of distilled water in a beaker and making up to 1 dm^3 with distilled water.

1 dm^3 of 0.1 mol dm^{-3} sodium citrate. This is prepared by dissolving 29.4 g of sodium citrate in 500 cm^3 of distilled water in a beaker and making up to 1 dm^3 with distilled water.

Then 100 cm^3 of each buffer can be prepared as shown in the table below:

pH	**0.1 mol dm^{-3} citric acid / cm^3**	**0.1 mol dm^{-3} sodium citrate / cm^3**	**distilled water / cm^3**
3	47.0	3.0	50
4	33.0	17.0	50
5	21.0	29.0	50
6	10.0	40.0	50

(vii) **P**, pieces of red cabbage, with a total area of approximately 100 cm^2, in a container labelled **P**.

© UCLES 2015

Apparatus for each candidate should be clean.
Syringe needles are **not** required and must **not** be given to candidates.

Apparatus for each candidate	Quantity	✓
2 cm^3, 3 cm^3 or 5 cm^3 syringe, with the means to wash them out	2	
Beaker or container (capacity approximately 400 cm^3), containing tap water for pouring into test-tubes, labelled **For washing**	1	
Beaker or container (minimum capacity 400 cm^3), labelled **For waste**	1	
Beaker or container (capacity approximately 400 cm^3), containing approximately 200 cm^3 of distilled water, heated to about 40°C, labelled **A**	1	
Beaker or container (capacity approximately 250 cm^3)	1	
Paper towels	8	
Test-tubes, to hold a volume more than 15 cm^3 and less than 20 cm^3	6	
Test-tube rack or container, to hold 6 test-tubes	1	
Tripod, gauze, Bunsen burner and bench mat	1	
Blunt forceps	1	
Glass rod	1	
Scalpel blade or sharp blade	1	
Stop clock or timer showing seconds	1	
White card (approximately 10 cm × 10 cm)	1	
White tile or other suitable surface for cutting	1	
Glass marker pen	1	
Safety glasses/goggles	1	

During the examination, the Supervisor (**not** the Invigilator) should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and materials as the candidates, in order to obtain results for **Q1(b)(ii)**. These results should be written in the Supervisor's Report, on page 8, **not** on a spare question paper.

The Supervisor's Report and the candidates' seating plan should be enclosed with the candidates' scripts.

Please ensure that, if the scripts are in several packets a copy of the Supervisor's Report and the candidates' seating plan are enclosed with each packet of scripts.

The Invigilator should **not** carry out **Question 1**.

© UCLES 2015

Question 2

(i) Slide **L1** (supplied by Cambridge).

On receipt of the slides, please check that they are labelled **L1** and that none of the slides are broken. The material is **confidential** (so **must not** be disclosed to candidates) and the slides should **not** be viewed in advance of the examination.

The number of slides supplied by Cambridge will be equal to half the candidate entry. Therefore, half the candidates should start on **Question 2** and the other half should start on **Question 1**.

(ii) Microscope as described on page 2.

For each candidate:

- the microscope must be set up on low power
- the slide must **not** be on the stage of the microscope.

MATERIALS TO BE SUPPLIED BY CAMBRIDGE

(i) Question papers.

(ii) Slide **L1**.

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

Immediately after the examination the microscope slides **must** be:

- returned to Cambridge in the containers in which they were received, using the self-adhesive label. 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. The order form must **not** be included in the packet of scripts.

Slides and boxes will be charged at the rate of £3 per slide and £1 per box.

If the items are not returned or purchased by the deadline stated on the order form they will be charged at £3.50 per slide plus £1 per box.

SUPERVISOR'S REPORT and SEATING PLAN

The teacher responsible for the examination is asked to fill in the Supervisor's Report in these Confidential Instructions.

For Centres where more than one script packet is used, there must be a copy of the completed Supervisor's Report and the candidates' seating plan in each script packet. These Supervisors' Reports are essential in order to allow the Examiner to assess all candidates as fairly as possible and should always be completed by every Centre.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

© UCLES 2015

9700/35

This form should be completed and sent to the Examiner with the scripts

SUPERVISOR'S REPORT

October/November 2015

The Supervisor or Teacher responsible for the subject should provide the following information.

1. Was any difficulty experienced in providing the necessary materials? If so, give brief details.

2. Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

(a) difficulties arising from faulty specimens or microscopes;

(b) accidents to apparatus or materials;

(c) assistance provided in case of colour-blindness;

(d) any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

All other cases of individual hardship, e.g. illness or disability, should be reported direct to CIE on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

3. During the examination, the Supervisor should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and reagents as the candidates. These results for **Question 1(b)(ii)** should be written in the Supervisor's Report, which should be enclosed with the candidates' scripts. If the scripts are in several packets, please ensure that a copy of the Supervisor's Report is enclosed with each packet of scripts. The Invigilator should **not** carry out **Question 1.**

4. Enclose a **seating plan** of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for **each question**. Use **separate** paper for this.

Declaration (to be signed by the Principal or the Examinations Officer)

The preparation of this practical examination has been carried out so as to maintain the security of the examination.

Signed .....

Name (in block capitals) .....

Centre number (of enclosed scripts) .....

Centre name .....

If scripts are required by CIE to be despatched in more than one envelope, it is essential that a copy of the

- relevant Supervisor's Report
- appropriate seating plan(s) are sent inside **each envelope**.

© UCLES 2015

[Turn over

Temperature of examination room ..... °C

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

© UCLES 2015

Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/36**

Advanced Practical Skills 2 **October/November 2015**

CONFIDENTIAL INSTRUCTIONS

Great care should be taken to ensure that any confidential information given, including the identity of material on microscope slides where appropriate, does not reach the candidates either directly or indirectly.

5116781752

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: info@cie.org.uk
by phone: +44 1223 553554
by fax: +44 1223 553558
stating the Centre number, the nature of the query and the syllabus number quoted above.

This document consists of **8** printed pages.

© UCLES 2015

CAMBRIDGE International Examinations

[Turn over

Instructions for preparing apparatus

These instructions give details of the apparatus required by each candidate for each experiment in this paper. A summary of the questions that will be presented to the candidates is included, where appropriate, to allow the biology teacher to test the apparatus appropriately.
No access to the question paper is permitted in advance of the examination.

If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Supervisor's Report.

Candidates must be provided with a microscope with:

- Eyepiece lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- Low-power objective lens, ×10 (equal to 16 mm or $\frac{2}{3}''$)
- High-power objective lens, ×40 (equal to 4 mm or $\frac{1}{6}''$)
- Eyepiece graticule fitted within the eyepiece and visible in focus at the same time as the specimen.

To avoid confusion, Cambridge request that only the lenses specified above are fitted in the microscopes to be used in the examination. Any lenses which are **not** ×10 or ×40 should be removed or replaced.

Each candidate must have uninterrupted use of the microscope for at least one hour.

Supervisors are advised to remind candidates that **all** substances in the examination should be treated with caution. Pipette fillers and safety goggles should be used where necessary.

In accordance with the COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

The following codes are used where relevant.

C = corrosive substance

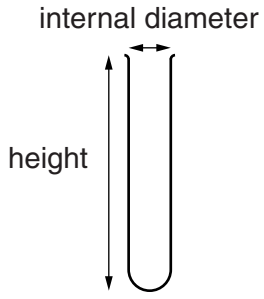
F = highly flammable substance

H = harmful or irritating substance

O = oxidising substance

T = toxic substance

N = harmful to environment



When small test-tubes are provided, it is expected that these are approximately 150 mm in height.

If other dimensions are required, these will be specified in the Apparatus list.

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres should also refer to the Handbook for Centres.

If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to resolve, it is essential for Centres to contact the Product Manager as soon as possible by **e-mail** to info@cie.org.uk, by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

© UCLES 2015

Confidential Instructions

No access to the Question Paper is permitted in advance of the examination.

Each candidate will require:

For both Questions

- mm ruler.

Question 1

- Solutions and reagents provided to the candidates should be supplied in a suitable beaker, or container. More of the solutions and reagents should be available if requested by candidates.
- All solutions should be provided to candidates at **room temperature**.
- Fresh **S1**, **W** and **I** are needed for each candidate.
- More of the pieces of onion should be available if requested by the candidates.
- All solutions and reagents should be disposed of according to local safety regulations.

The pieces of onion must be left in sodium chloride solution for at least one hour before the examination. The pieces of onion may be left overnight in covered containers.

Summary of solutions and reagents:

labelled	contents	hazard	volume /cm^3
S1	1.0 mol dm^{-3} sodium chloride solution containing one piece of onion	none	at least 50 (enough to cover one piece of onion)
W	distilled water	none	at least 50
I	iodine solution as used for testing for starch	[H] harmful [H] irritant stains	at least 10

It is advisable to wear safety glasses/goggles and gloves when handling chemicals.

Preparation of solutions and reagents:

Solutions may be prepared the day before but should be kept in covered containers in a refrigerator. However, they should be supplied to candidates at **room temperature** for the examination.

(i) **S1**, at least 50 cm^3 of 1.0 mol dm^{-3} sodium chloride solution supplied in a beaker or container, labelled **S1**.
This is prepared by putting 58.5 g of sodium chloride in 500 cm^3 of distilled water in a beaker or container and making up to 1 dm^3 with distilled water.

(ii) **W**, at least 50 cm^3 of distilled water in a beaker or container, labelled **W**.

[H] **(iii)** **I**, at least 10 cm^3 of iodine solution as used for testing starch, in a suitable container with a pipette, labelled **I**.

© UCLES 2015

Preparation of pieces of onion:

- Candidates should **not** be given red onion. Onions with white flesh should be used, either with dry brown scales (yellow onion) or with dry white scales (white onion).
- The onions should be as fresh as possible to avoid the effects of storage.
- The pieces of onion must be left in the solution for at least one hour before the examination or may be prepared the day before and left overnight in the solution with the containers covered to prevent evaporation.

(i) Cut off the top and bottom of the onion.

(ii) Remove the outer dry scales.

(iii) Cut the onion into pieces as in Fig. 1.1.

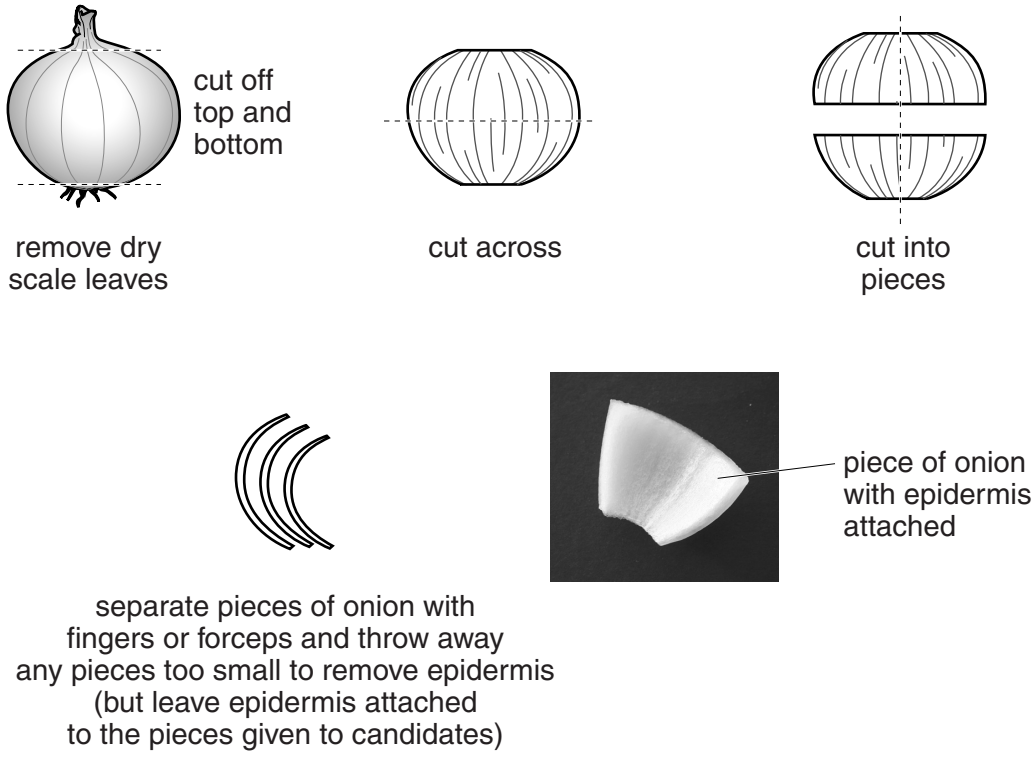


Fig. 1.1

(iv) Place the number of pieces of onion required for all the candidates with some spares into large containers with enough of the sodium chloride solution, **S1** to submerge the onion pieces. Cover the containers.

© UCLES 2015

Apparatus for each candidate should be clean.

Apparatus for each candidate	Quantity	✓
Pipettes, glass or plastic, for dispensing liquids	2	
Clean and dry microscope slides with coverslips	4	
Black card approximately 10 cm × 10 cm	1	
Paper towels	8	
Blunt forceps	1	
Mounted needle	1	
Scalpel or sharp blade	1	
White tile or other suitable surface for cutting	1	
Glass marker pen	1	
Microscope as described on page 2 For each candidate: • the microscope must be set up on low power • the slide must **not** be left on the stage of the microscope.	1	

During the examination, the Supervisor (**not** the Invigilator) should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and reagents as the candidates, in order to obtain results for **Q1 (b)(iv)**. These results should be written in the Supervisor's Report on page 8, **not** on a spare question paper.

The Supervisor's Report and the candidates' seating plan should be enclosed with the candidates' scripts.

Please ensure that, if the scripts are in several packets, a copy of the Supervisor's Report and the candidates' seating plan are enclosed with each packet of scripts.

The Invigilator should **not** carry out **Question 1**.

Question 2

Each candidate will require:

(i) Scissors, suitable for cutting paper.

© UCLES 2015

MATERIALS TO BE SUPPLIED BY CAMBRIDGE

(i) Question papers.

Note: no slide is supplied

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

There is no material to return to Cambridge.

SUPERVISOR'S REPORT and SEATING PLAN

The teacher responsible for the examination is asked to fill in the Supervisor's Report in these Confidential Instructions.

For Centres where more than one script packet is used, there must be a copy of the completed Supervisor's Report and the candidates' seating plan in each script packet. These Supervisors' Reports are essential in order to allow the Examiner to assess all candidates as fairly as possible and should always be completed by every Centre.

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2015

9700/36

This form should be completed and sent to the Examiner with the scripts

SUPERVISOR'S REPORT

October/November 2015

The Supervisor or Teacher responsible for the subject should provide the following information.

1. Was any difficulty experienced in providing the necessary materials? If so, give brief details.

2. Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

(a) difficulties arising from faulty specimens or microscopes;

(b) accidents to apparatus or materials;

(c) assistance provided in case of colour-blindness;

(d) any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

All other cases of individual hardship, e.g. illness or disability, should be reported direct to CIE on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

3. During the examination, the Supervisor should, **out of the sight of the candidates**, carry out **Question 1** using the same solutions and reagents as the candidates. The results for **Question 1(b)(iv)** should be written in the Supervisor's Report, which should be enclosed with the candidates' scripts. If the scripts are in several packets, please ensure that a copy of the Supervisor's Report is enclosed with each packet of scripts. The Invigilator should **not** carry out **Question 1**.

4. Enclose a **seating plan** of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for **each question**. Use **separate** paper for this.

Declaration (to be signed by the Principal or the Examinations Officer)

The preparation of this practical examination has been carried out so as to maintain the security of the examination.

Signed .....

Name (in block capitals) .....

Centre number (of enclosed scripts) .....

Centre name .....

If scripts are required by CIE to be despatched in more than one envelope, it is essential that a copy of the

- relevant Supervisor's Report
- appropriate seating plan(s) are sent inside **each envelope**.

© UCLES 2015

[Turn over

Temperature of examination room ..... °C

Results for **Question 1(b)(iv)**

© UCLES 2015