www.XtremePapers.com

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

BIOLOGY **9700/31**

Paper 3 Advanced Practical Skills **October/November 2009**

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.

2214772762

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: International@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 (SHW 00338 7/08) 16161/5
© UCLES 2009

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:

- Low-power objective lens, e.g. × 10 (equal to 16 mm or $\frac{2}{3}$″)
- High-power objective lens, e.g. × 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.

Each candidate must have sole, uninterrupted, use of the microscope for at least 55 minutes.

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

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres are also referred to the Handbook for Centres, and in particular Section 3.1.2 (c) (i), Security of Question Papers and Examination Materials, as well as 3.3.11.1, Practical Examinations in Science Subjects.

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

© UCLES 2009

Confidential Instructions

Each candidate will require:

Question 1

Fresh **W**, **X**, **Y**, **Z**, **P**, **H**, **S** and **B** are needed for each candidate.
More of the solutions should be available if requested by candidates.

All solutions and reagents given to candidates must be in a suitable beaker, or container, to allow the removal of the solution using the appropriate syringe.

(i) At least 10 cm^3 of each of the following sucrose solutions in beakers, labelled **W**, **X**, **Y** and **Z**.

beaker	sucrose concentration / g 100 cm^{-3}
W	5.00
X	2.50
Y	1.00
Z	0.25

(ii) Prepare a stock solution of sucrose as follows.

5 g 100 cm^{-3} sucrose stock solution
This is prepared by dissolving 5 g of sucrose in 50 cm^3 of distilled water and making it up to 100 cm^3 with distilled water.

Use the 5 g 100 cm^{-3} stock solution to make up the solutions as follows (this will make enough for two candidates):

beaker	concentration of sucrose / g 100 cm^{-3}	volume of 5 g 100 cm^{-3} stock solution / cm^3	volume of distilled water / cm^3
W	5.00	20	0
X	2.50	10	10
Y	1.00	4	16
Z	0.25	1	19

(iii) 2 cm^3 of a further sucrose concentration in a large test-tube (boiling), labelled **P, made up using 2.5 cm^3 of the 5 g 100 cm^{-3} stock solution and 17.5 cm^3 of distilled water**.

[H] (iv) At least 20 cm^3 of dilute hydrochloric acid in a beaker, labelled **H**.

(v) At least 20 cm^3 of 1 mol dm^{-3} sodium hydrogen carbonate (bicarbonate) in a beaker, labelled **S**. This is prepared by dissolving 8.4 g of sodium hydrogen carbonate in 50 cm^3 of distilled water and making it up to 100 cm^3 with distilled water.

[H] (vi) At least 20 cm^3 of Benedict's solution in a beaker, labelled **B**.

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

© UCLES 2009

Apparatus:

(vii) Four large test-tubes (or boiling tubes).

(viii) 400 cm^3 beaker for setting up boiling water-bath to hold five large test-tubes, Bunsen burner, gauze, tripod and mat. Candidates should be provided with hot water in their beaker and further supplies made available.

(ix) Matches or means to light a Bunsen burner.

(x) Test-tube holder.

(xi) One 5 cm^3 or 10 cm^3 syringe.

(xii) One 1 cm^3 or 2 cm^3 syringe.

(xiii) Container with tap water, labelled **for washing**.

(xiv) Container, labelled **waste**.

(xv) Stop clock, stop watch or sight of a clock with second hand.

(xvi) Test-tube rack or beaker to hold large test-tubes.

(xvii) Thermometer –10 °C to 110 °C.

(xviii) Glass marker pen.

(xix) Safety goggles/glasses.

The Supervisor should, **out of the sight of the candidates**, carry out **Q.1** and write the **results** in the Supervisor's report which should be enclosed with the candidates' scripts. Please ensure that if the scripts are in several packets that a copy of the Supervisor's report is enclosed with each packet of scripts. The invigilator should **not** carry out **Q.1**.

© UCLES 2009

Question 3

Each candidate will require:

(i) 5 cm^3 of 4.0% boiled yeast suspension in a test-tube or small container, labelled **A1**. 4 g of dried yeast should be suspended in 100 cm^3 distilled water and placed in a boiling water-bath for **at least 5 minutes**. To check that all the yeast cells are dead, place a drop of suspension onto a microscope slide and add 1 drop of methylene blue as made up below. Mix with a glass rod and leave for 5 minutes. Add a coverslip and observe using high-power objective lens of the microscope. If the cells are not all blue boil for an extra five minutes.

(ii) 5 cm^3 of 4.0% yeast suspension in a 2.0% sodium chloride solution in a test-tube, labelled **A2**. 4 g of dried yeast should be suspended in 100 cm^3 of a 2.0% solution of sodium chloride. The 2.0% solution of sodium chloride is prepared by dissolving 2 g of sodium chloride in 50 cm^3 of distilled water and making it up to 100 cm^3 with distilled water.

(iii) 5 cm^3 of 4.0% yeast suspension with added glucose in a test-tube, labelled **A3**. 4 g of dried yeast should be suspended in 100 cm^3 of warm distilled water and then 5 g of glucose sprinkled over the surface and stirred. This should be added at least 15 minutes before the candidate starts **Q.3**. The yeast needs to be actively frothing.

It is very important to try the yeast well before the practical starts to make sure that it will make an actively frothing suspension. Baker's yeast will usually froth when made up as above. Other sources of yeast may need to be kept warm overnight to become active. Fresh A3 should be provided for each candidate.

(iv) 5 cm^3 of freshly prepared 1% methylene blue solution in a container with a pipette, labelled **methylene blue**. This is prepared by dissolving 1.0 g of methylene blue and 0.6 g of sodium chloride in 50 cm^3 of distilled water and making it up to 100 cm^3 with distilled water.

(v) Three microscope slides and three coverslips.

(vi) Teat pipette (dropping pipette) to remove samples from the test-tubes.

(vii) Container with tap water, labelled **for washing**.

(viii) Container, labelled **waste**.

(ix) Glass rod.

(x) Glass marker pen.

(xi) Paper towel for blotting.

(xii) Stop clock, stop watch or sight of a clock.

(xiii) A microscope:

- Low-power objective lens, e.g. × 10 (equal to 16 mm or $\frac{2}{3}$″)
- High-power objective lens, e.g. × 40 (equal to 4 mm or $\frac{1}{6}$″)

Each candidate must have sole, uninterrupted use of the microscope for 55 minutes.

No slides from Cambridge are required for this examination.

© UCLES 2009

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

There are no materials to return to CIE on this occasion.

REPORT FORM

The Supervisor should, **out of the sight of the candidates**, carry out **Q.1** and **Q.3** and write the **results** in the Supervisor's report which should be enclosed with the candidates' scripts. Please ensure that if the scripts are in several packets that a copy of the Supervisor's report is enclosed with each packet of scripts. The invigilator should **not** carry out **Q.1** or **Q.3**.

The teacher responsible for the examination is asked to fill in the Report Form on pages 7 and 8 of these Confidential Instructions. For Centres where more than one script envelope is used, there must be a copy of the complete Report Form in each script parcel.

These reports forms are vital in order to allow the examiners to assess all candidates as fairly as possible and should always be completed by every Centre.

A copy of the seating plan for the examination room must also be enclosed in each script parcel.

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.

University of 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.

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

REPORT ON PRACTICAL BIOLOGY

A Level

October/November Session 2009

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 Part 6 of the Handbook for Centres.

3. Results for question **1(a)(i)**.

© UCLES 2009

[Turn over

4. Results for question **3(a)(i)**.

5. Enclose a plan of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for each session.

Declaration (to be signed by the Principal)

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

Signed .....

Name (in block capitals) .....

Centre number .....

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 and the appropriate seating plan(s) are sent inside **each envelope**.

© UCLES 2009

www.XtremePapers.com

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

BIOLOGY **9700/32**

Paper 3 Advanced Practical Skills **October/November 2009**

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.

7155709313

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: International@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 (SHW 00338 7/08) 16162/4
© UCLES 2009

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:

- Low-power objective lens, e.g. × 10 (equal to 16 mm or $\frac{2}{3}$″)
- High-power objective lens, e.g. × 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.

Each candidate must have sole, uninterrupted, use of the microscope for at least 55 minutes.

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

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres are also referred to the Handbook for Centres, and in particular Section 3.1.2 (c) (i), Security of Question Papers and Examination Materials, as well as 3.3.11.1, Practical Examinations in Science Subjects.

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

© UCLES 2009

Confidential Instructions

Each candidate will require:

Question 1

Fresh reagents and **S1**, **S2**, **S3** and **S4** are needed for each candidate.
More of the solutions should be available if requested by candidates.

All solutions and reagents given to candidates must be in a suitable beaker, or container, to allow the removal of the solution using the appropriate syringe.

You will need the following stock solutions:

1% starch solution
This is prepared by dissolving 1 g of starch in 10 cm^3 of distilled water and stirring well. Make up to 100 cm^3 with boiling distilled water, stir well and then cool to room temperature.

0.2% starch solution
This is prepared by adding 20 cm^3 of the 1% starch solution to 80 cm^3 of distilled water and stirring well. THE 0.2% STARCH SOLUTION IS NOT REQUIRED BY THE CANDIDATES BUT IS NEEDED TO OBTAIN THE FOLLOWING TWO CONCENTRATIONS.

0.02% starch solution
This is prepared by adding 10 cm^3 of the 0.2% starch solution to 90 cm^3 of distilled water and stirring well.

0.002% starch solution
This is prepared by adding 10 cm^3 of the 0.02% starch solution to 90 cm^3 of distilled water and stirring well.

20% glucose solution
This is prepared by dissolving 20 g of glucose in 50 cm^3 of distilled water and making it up to 100 cm^3 with distilled water.

2% glucose solution
This is prepared by adding 10 cm^3 of the 20% glucose solution to 90 cm^3 of distilled water and stirring well. THE 2% GLUCOSE SOLUTION IS NOT REQUIRED BY THE CANDIDATES BUT IS NEEDED TO OBTAIN THE FOLLOWING CONCENTRATION.

0.2% glucose solution
This is prepared by adding 10 cm^3 of the 2.0% glucose solution to 90 cm^3 of distilled water and stirring well.

(i) At least 20 cm^3 of a solution, in a beaker, labelled **S1**, made up by adding 10 cm^3 of 0.02% starch solution to 10 cm^3 of 0.2% glucose solution.

At least 20 cm^3 of a solution, in a beaker, labelled **S2**, made up of 20 cm^3 of 1% starch solution.

At least 20 cm^3 of a solution, in a beaker, labelled **S3**, made up the same as **S1**.

At least 20 cm^3 of a solution, in a beaker, labelled **S4**, made up by adding 10 cm^3 of 0.002% starch solution to 10 cm^3 of 20% glucose solution.

[H] (ii) At least 20 cm^3 of iodine in potassium iodide in a bottle with a teat pipette, labelled **iodine solution**.

[H] (iii) At least 50 cm^3 of Benedict's solution in a beaker or container (so that a syringe can be used), labelled **Benedict's solution**.

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

Apparatus:

(i) Spotting tile.

(ii) Teat pipette (dropping pipette).

(iii) Four large test-tubes (boiling tubes), or glass test-tubes suitable for heating.

(iv) Test-tube holder.

(v) Glass rod.

(vi) Two 10 cm^3 syringes.

(vii) Container with tap water, labelled **for washing**.

(viii) Container, labelled **waste**.

(ix) Stop clock, stop watch or sight of a clock with second hand.

(x) Water-bath with water at more than 80 °C or Bunsen burner, tripod, gauze and bench mat plus beaker suitable for water-bath and matches.

(xi) Test-tube rack or beaker to hold large test-tubes.

(xii) Glass marker pen.

(xiii) Safety goggles/glasses.

(xiv) Thermometer –10 °C to 110 °C.

The Supervisor should, **out of the sight of the candidates**, carry out **Q.1** and write the **results** in the Supervisor's report which should be enclosed with the candidates' scripts. Please ensure that if the scripts are in several packets that a copy of the Supervisor's report is enclosed with each packet of scripts. The invigilator should **not** carry out **Q.1**.

© UCLES 2009

Question 3

Each candidate will require:

(i) Petri dish or other suitable dish, labelled **L**, containing about 10 cm^2 of lettuce leaf which has been cut up into pieces, then made in to a suspension with no more than 3 cm^3 of water using either a blender or a pestle and mortar.

It is important that the suspension of the lettuce cells is fresh and that the Supervisor checks that the suspension of lettuce leaf is fine enough to show the epidermal cells, guard cells, mesophyll cells and xylem vessels which should be visible under the microscope. (If green lettuce is not available then cabbage or Chinese lettuce leaves may also be used).

(ii) Dish, labelled **P**, containing a piece of peeled Irish potato approximately 5 cm × 1 cm × 1 cm wrapped in a damp paper towel.

Fresh potato piece should be given to each candidate.

[H] (iii) At least 20 cm^3 of iodine in potassium iodide solution in a bottle with a teat pipette, labelled **iodine solution**.

(iv) Four microscope slides and four coverslips.

(v) Teat pipette (dropping pipette).

(vi) Container with tap water, labelled **for washing**.

(vii) Container, labelled **waste**.

(viii) Scalpel or sharp blade and tile/cutting surface.

(ix) Glass rod.

(x) Paper towel for absorbing excess liquid.

(xi) Stop clock, stop watch or sight of a clock.

(xii) A microscope:

- Low-power objective lens, e.g. × 10 (equal to 16 mm or $\frac{2}{3}$″)
- High-power objective lens, e.g. × 40 (equal to 4 mm or $\frac{1}{6}$″)

Each candidate must have sole, uninterrupted use of the microscope for 55 minutes.

No slides from Cambridge are required for this examination.

The Supervisor should indicate on page 8 of the Supervisor's report which type of leaf material was supplied to the candidates.

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

There are no materials to return to CIE on this occasion.

REPORT FORM

The Supervisor should, **out of the sight of the candidates**, carry out **Q.1** and **Q.3** and write the **results** in the Supervisor's report which should be enclosed with the candidates' scripts. Please ensure that if the scripts are in several packets that a copy of the Supervisor's report is enclosed with each packet of scripts. The invigilator should **not** carry out **Q.1**.

The teacher responsible for the examination is asked to fill in the Report Form on pages 7 and 8 of these Confidential Instructions. For Centres where more than one script envelope is used, there must be a copy of the complete Report Form in each script parcel.

These report forms are vital in order to allow the examiners to assess all candidates as fairly as possible and should always be completed by every Centre.

A copy of the seating plan for the examination room must also be enclosed in each script parcel.

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.

University of 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.

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

REPORT ON PRACTICAL BIOLOGY

A Level

October/November Session 2009

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 Part 6 of the Handbook for Centres.

© UCLES 2009

[Turn over

3. Results for question **1**.

4. Question **3** Leaf material supplied ……

5. Enclose a plan of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for each session.

Declaration (to be signed by the Principal)

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

Signed .....

Name (in block capitals) .....

Centre number .....

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 and the appropriate seating plan(s) are sent inside **each envelope**.

© UCLES 2009

www.XtremePapers.com

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

BIOLOGY **9700/33**

Paper 3 Advanced Practical Skills **October/November 2009**

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.

4756607048

If you have any problems or queries regarding these Instructions, please contact CIE
by e-mail: International@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 **7** printed pages and **1** blank page.

DC (SM) 14768/3
© UCLES 2009

UNIVERSITY of 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:

- Low-power objective lens, e.g. × 10 (equal to 16 mm or $\frac{2}{3}''$)
- High-power objective lens, e.g. × 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.

Each candidate must have sole, uninterrupted, use of the microscope for at least 55 minutes.

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

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination. Centres are also referred to the Handbook for Centres, and in particular Section 3.1.2 (c) (i), Security of Question Papers and Examination Materials, as well as 3.3.11.1, Practical Examinations in Science Subjects.

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

© UCLES 2009

Confidential Instructions

Question 1

Fresh reagents and **S1, S2, S3, S4** and **S5** are needed for each candidate.
More of the solutions should be available if requested by candidates.

All solutions and reagents given to candidates must be in a suitable beaker, or container, to allow the removal of the solution using the appropriate syringe.

You will need the following stock solutions:

1% starch solution
This is prepared by dissolving 1 g of starch in 10 cm^3 of distilled water and stirring well.
Make up to 100 cm^3 with boiling distilled water, stir well and then cool to room temperature.

This starch solution should give a negative result when tested with Benedict's solution.

0.1% starch solution
This is prepared by adding 10 cm^3 of the 1% starch solution to 90 cm^3 of distilled water and stirring well.

20% glucose solution
This is prepared by dissolving 20 g of glucose in 50 cm^3 of distilled water and making it up to 100 cm^3 with distilled water.

0.2% glucose solution
This is prepared by dissolving 2 g of glucose in 50 cm^3 of distilled water and making it up to 1 dm^3 with distilled water.

2% egg albumen solution
This is prepared by dissolving 2 g of egg albumen in 50 cm^3 of warm distilled water and stirring well. Make up to 100 cm^3 with distilled water.

Each candidate will require:

(i) **S1**, at least 20 cm^3 of 0.1% starch solution, in a beaker or container, labelled **S1**.

S2, at least 20 cm^3 of a solution, in a beaker or container, labelled **S2**, made up of 10 cm^3 of 2% egg albumen solution and 10 cm^3 of 20% glucose solution. Stir well.

S3, at least 20 cm^3 of a solution, in a beaker or container, labelled **S3**, made up of 10 cm^3 of 1.0% starch solution and 10 cm^3 of 0.2% glucose solution. Stir well.

S4, at least 20 cm^3 of distilled water, in a beaker or container, labelled **S4**.

S5, at least 20 cm^3 of a solution, in a beaker or container, labelled **S5**, made up of 10 cm^3 of 2% egg albumen solution and 10 cm^3 of 0.1% starch solution. Stir well.

[H] (ii) At least 20 cm^3 of iodine in potassium iodide solution, in a beaker or container, labelled **Iodine solution**.

[H] (iii) At least 50 cm^3 of Benedict's solution, in a beaker or container, labelled **Benedict's solution**.

(iv) [C] [H] At least 50 cm^3 of biuret reagent, in a beaker or container, labelled **biuret reagent**. Alternatively, the Centre should provide the separate chemicals which candidates use to test for protein, suitably labelled. These should be in beakers or containers (so that a syringe can be used).

© UCLES 2009

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

Apparatus:

- **(i)** Spotting tile.
- **(ii)** Teat pipette (dropping pipette).
- **(iii)** One 2 cm^3 or 5 cm^3 syringe.
- **(iv)** One 10 cm^3 syringe.
- **(v)** Container with tap water, labelled **For washing**.
- **(vi)** Container, labelled **Waste**.
- **(vii)** Five large test-tubes (boiling tubes), or glass test-tubes suitable for heating.
- **(viii)** Five test-tubes.
- **(ix)** Test-tube holder.
- **(x)** Glass rod.
- **(xi)** Stop clock, stop watch or sight of a clock.
- **(xii)** Water-bath with water at more than 80 °C or Bunsen burner, tripod, gauze and bench mat plus at least 400 cm^3 beaker suitable for water-bath and matches.
- **(xiii)** Test-tube rack or beaker to hold large test-tubes.
- **(xiv)** Glass marker pen.
- **(xv)** Safety goggles/glasses.
- **(xvi)** Paper towel.
- **(xvii)** Thermometer –10 °C to 110 °C.

The Supervisor should, **out of the sight of the candidates**, carry out **Q.1** and write the **results** in the Supervisor's report which should be enclosed with the candidates' scripts. Please ensure that if the scripts are in several packets that a copy of the Supervisor's report is enclosed with each packet of scripts. The invigilator should **not** carry out **Q.1**.

© UCLES 2009

Question 2

Each candidate will require:

(i) Slide **J1** (from Cambridge).

(ii) A microscope:

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

Each candidate must have sole, uninterrupted use of the microscope for 55 minutes.

On receipt of the slides, please check that they are labelled **J1** and that all slides are intact. The identity of material on the slides is **confidential** and must **not** be disclosed to candidates.

Cambridge will supply enough slides for half of the candidates to do **Q.2** first, followed by the other half of the candidates.

RETURN OF EXAMINATION MATERIALS TO CAMBRIDGE

Immediately after the examination, microscope slides **must** be returned to CIE in the containers in which they were received, using the self-adhesive label for the parcel. They must **not** be included in the parcel of scripts. It may be possible to buy the slides, in which case an order form will be enclosed with the slides, and should be returned to CIE using the self-adhesive label for the letter. Slides and containers not returned in good condition will be charged at a rate of £4 per item to which may be added administrative costs.

REPORT FORM

The teacher responsible for the examination is asked to fill in the Report Form on pages 7 and 8 of these Confidential Instructions. For Centres where more than one script envelope is used, there must be a copy of the complete Report Form in each script parcel.

These report forms are vital in order to allow the examiners to assess all candidates as fairly as possible and should always be completed by every Centre.

A copy of the seating plan for the examination room must also be enclosed in each script parcel.

© UCLES 2009

BLANK PAGE

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.

University of 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.

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

REPORT ON PRACTICAL BIOLOGY

A Level

October/November Session 2009

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 Part 6 of the Handbook for Centres.

© UCLES 2009

[Turn over

3. Results for question **1**.

4. Enclose a plan of work benches with the scripts, giving details of the candidate numbers of the places occupied by the candidates for each session.

Declaration (to be signed by the Principal)

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

Signed .....

Name (in block capitals) .....

Centre number .....

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 and the appropriate seating plan(s) are sent inside **each envelope**.

© UCLES 2009