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**BIOLOGY**

**9700/34**

Advanced Practical Skills 2

**October/November 2014**

**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.**

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If you have any problems or queries regarding these Instructions, please contact CIE

by e-mail: [info@cie.org.uk](mailto: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.

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

### 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,  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
- Low-power objective lens,  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
- High-power objective lens,  $\times 40$  (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**  $\times 10$  or  $\times 40$  should be removed or replaced.

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

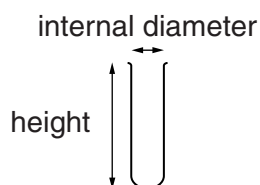
**F** = highly flammable substance

**H** = harmful or irritating substance

**O** = oxidising substance

**T** = toxic substance

**N** = harmful to environment



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](mailto:info@cie.org.uk), by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

**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, for removal of the solutions and reagents using a syringe. More of the solutions and reagents should be available if requested by candidates.
- All solutions should be provided to candidates at **room temperature**.
- Fresh test-tubes and syringes are needed for each candidate.
- Fresh **K, C, P1, P2, U** and **W** are needed for each candidate.
- All solutions and reagents should be disposed of according to local safety regulations.

Summary of solutions and reagents:

labelled	contents	hazard	volume /cm <sup>3</sup>
<b>K</b>	5% potassium hydroxide solution	[H] harmful [H] irritant [C] corrosive	at least 20
<b>C</b>	0.3% copper sulfate solution	[H] harmful	at least 20
<b>P1</b>	0.8% albumen solution	none	40
<b>P2</b>	1.0% albumen solution	none	40
<b>U</b>	0.2% albumen solution	none	20
<b>W</b>	distilled water	none	120

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

Preparation of solutions and reagents:

**[H][C] (i) K**, at least 20 cm<sup>3</sup> of 5% potassium hydroxide solution in a beaker or container, labelled, **K**.

*You are advised to wear safety glasses or goggles especially when using the potassium hydroxide solution, K. If potassium hydroxide solution, K, comes into contact with your skin, wash it off with plenty of cold water.*

This is prepared by dissolving 5.0 g of potassium hydroxide into 80 cm<sup>3</sup> distilled water and making up to 100 cm<sup>3</sup> with distilled water.

**[H] (ii) C**, at least 20 cm<sup>3</sup> of 0.3% copper sulfate solution in a beaker or container, labelled **C**.

This gives a very pale blue solution – you **must** make up this concentration.

Do **not** use anhydrous copper sulfate.

This is prepared by dissolving 0.3 g of copper sulfate pentahydrate (CuSO<sub>4</sub>.5H<sub>2</sub>O) in 80 cm<sup>3</sup> distilled water and making up to 100 cm<sup>3</sup> with distilled water.

*You will need the following stock solution:*

**1% albumen solution** – this must be prepared **on the day of the examination**.

This is prepared by dissolving 2.0 g of albumen in 20 cm<sup>3</sup> of distilled water and mixing well. Make up to 200 cm<sup>3</sup> with distilled water and stir until dissolved.

**(iii) P1**, at least 40 cm<sup>3</sup> of 0.8% albumen solution, in a beaker or container, labelled **P1**.

This is prepared by putting 80 cm<sup>3</sup> of the 1% stock solution into a beaker and making up to 100 cm<sup>3</sup> with distilled water.

**(iv) P2**, at least 40 cm<sup>3</sup> of 1% albumen solution, in a beaker or container labelled **P2**.

This is the same as the stock solution.

Note: This is intentionally **not** the same concentration as that given on the question paper.

**(v) U**, at least 20 cm<sup>3</sup> of 0.2% albumen solution, in a beaker or container, labelled **U**.

To prepare 0.2% albumen solution, put 20 cm<sup>3</sup> of the 1% stock solution into a beaker and make up to 100 cm<sup>3</sup> with distilled water.

**To test:** put **1 cm<sup>3</sup>** of **U** into a test-tube, add **1 cm<sup>3</sup>** of **K**, mix and add **1 cm<sup>3</sup>** of **C**, a light blue-purple colour should be observed (**not dark** purple).

**(vi) W**, at least 120 cm<sup>3</sup> of distilled water in a beaker or container, labelled **W**.

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

Apparatus for each candidate	Quantity	✓
10 cm <sup>3</sup> syringe with the means to wash it out	2	
1 cm <sup>3</sup> or 2 cm <sup>3</sup> or 3 cm <sup>3</sup> syringe with the means to wash it out	3	
Glass rod	1	
Beaker or container, (approximately 200 cm <sup>3</sup> ), with tap water for pouring into test-tubes, labelled <b>For washing</b>	1	
Beaker or container, (approximately 200 cm <sup>3</sup> ), labelled <b>For waste</b>	1	
Paper towels	8	
Test-tubes – to hold more than 15 cm <sup>3</sup> but no more than 30 cm <sup>3</sup>	7	
Beakers or containers to hold at least 50 cm <sup>3</sup> to allow the small syringe to remove liquid	6	
Test-tube rack(s) to hold the 7 test-tubes	1	
White card or white paper or white tile	1	
Glass marker pen	1	
Safety goggles/glasses	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. These results should be written in the Supervisor's Report, 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

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**.

For each candidate:

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

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

- (i) Slide **L1** (supplied by Cambridge)
- (ii) Microscope with:
  - Low-power objective lens,  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
  - High-power objective lens,  $\times 40$  (equal to 4 mm or  $\frac{1}{6}$ " )
  - Eyepiece lens,  $\times 10$  (equal to 16 mm or  $\frac{2}{3}$ " )
  - 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**  $\times 10$  or  $\times 40$  should be removed or replaced.

### **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. They 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 Examiners to assess all candidates as fairly as possible and should always be completed by every Centre.

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Temperature of examination room ..... °C

Results for **Question 1(a)(i) and 1(a)(v)**:

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

