



**READ THESE INSTRUCTIONS FIRST**

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. **Testing must be done out of sight of all candidates.**

**No access to the question paper is permitted in advance of the examination.**

Centres are reminded that candidates are expected to follow the instructions on the question paper and record all their results. They will not be penalised if these results are not what they expect.

The Supervisor should make sure that the Supervisor's Report is fully completed and a copy is enclosed with each packet of scripts.

It is assumed that the ordinary apparatus of a science laboratory will be available, including a supply of purified water (distilled or deionised).

If arrangements are made for different sessions for different groups of candidates, care must be taken to ensure that the different groups of candidates are effectively isolated so that **no information passes between them.**

**All specimens should carry only the code letters and numbers as indicated and their identity should not be revealed to the candidates.**

Supervisors should ensure that all specimens have the correct identity attached to the specimen and that these are **not** removed during 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 on the Supervisor's Report.

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

In accordance with 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:

<b>C</b>	=	corrosive	<b>MH</b>	=	moderate hazard
<b>HH</b>	=	health hazard	<b>T</b>	=	acutely toxic
<b>F</b>	=	flammable	<b>O</b>	=	oxidising
<b>N</b>	=	hazardous to the aquatic environment			

Centres are reminded that they are **not** permitted to open the question paper envelopes before the examination.

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.

**Question 1**

Each candidate should be provided with:

- (i) six test-tubes, supported in a test-tube rack
- (ii) means of labelling glassware, e.g. a marker pen
- (iii) four × means of measuring 3 cm<sup>3</sup> (e.g. 4 × 5 cm<sup>3</sup> syringe, without needle)
- (iv) means of measuring 1 cm<sup>3</sup> (e.g. 1 cm<sup>3</sup> syringe, without needle)
- (v) **provided on request**, approximately 150 cm<sup>3</sup> of hot water (85 °C–90 °C), in a 250 cm<sup>3</sup> beaker
- (vi) view of a clock or timer that allows the candidate to time seconds accurately
- (vii) iodine in potassium iodide solution, presented in a dropping bottle, labelled **iodine solution**
- (viii) 15 cm<sup>3</sup> of Benedict's solution (as normally used for food testing) in a small beaker, labelled **reducing sugar test solution**
- (ix) 10 cm<sup>3</sup> of 1% starch solution, in a small beaker, labelled **starch solution**
- (x) 15 cm<sup>3</sup> of the liquid mixture of starch, vitamin C and glucose in a small beaker, labelled **P**
- (xi) 15 cm<sup>3</sup> of 1% starch solution, in a small beaker, labelled **Q**
- (xii) 15 cm<sup>3</sup> of the liquid mixture of starch, vitamin C and glucose in a small beaker, labelled **R**
- (xiii) eye protection
- (xiv) access to paper towels (in case of spillages)

**Solution preparation***1% starch solution*

Note, candidates require two beakers of 1% starch solution, one labelled **starch solution** and one labelled **Q**.

This is prepared by heating 1 g of **soluble** starch in 90 cm<sup>3</sup> of distilled water until the liquid clears. Allow to cool and make up to 100 cm<sup>3</sup>. This will provide sufficient solution for 4 candidates.

**Solution P**

This is prepared by mixing together 100 cm<sup>3</sup> 1% starch solution, 100 cm<sup>3</sup> 0.2% vitamin C solution and 100 cm<sup>3</sup> 0.02% glucose solution. These solutions can be prepared as follows.

- *1% starch solution* This is prepared by heating 1 g of **soluble** starch in 90 cm<sup>3</sup> of distilled water until the liquid clears. Allow to cool and make up to 100 cm<sup>3</sup>.
- *0.2% vitamin C solution* This is prepared by dissolving 0.2 g vitamin C (ascorbic acid) in 90 cm<sup>3</sup> of distilled water and making up to 100 cm<sup>3</sup>.
- *0.02% glucose solution* This is prepared by dissolving 0.02 g glucose in 90 cm<sup>3</sup> of distilled water and making up to 100 cm<sup>3</sup>.

This will provide sufficient solution for 20 candidates.

**Solution R**

This is prepared by mixing together 100 cm<sup>3</sup> 1% starch solution, 100 cm<sup>3</sup> 0.2% vitamin C solution and 100 cm<sup>3</sup> 0.4% glucose solution. These solutions can be prepared as follows.

- *1% starch solution* This is prepared by heating 1 g of **soluble** starch in 90 cm<sup>3</sup> of distilled water until the liquid clears. Allow to cool and make up to 100 cm<sup>3</sup>.
- *0.2% vitamin C solution* This is prepared by dissolving 0.2 g vitamin C (ascorbic acid) in 90 cm<sup>3</sup> of distilled water and making up to 100 cm<sup>3</sup>.
- *0.4% glucose solution* This is prepared by dissolving 0.4 g glucose in 90 cm<sup>3</sup> of distilled water and making up to 100 cm<sup>3</sup>.

This will provide sufficient solution for 20 candidates.

The Supervisor (**not** the Invigilator) should carry out the practical aspects of **Question 1** and record their results in the space provided in the Supervisor's Report. This must be done during the examination, using the same apparatus and reagents as the candidates but **out of sight** of the candidates.

**Question 2**

Each candidate should be provided with:

- (i) one ruler (with mm scale)



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

**REPORT ON PRACTICAL BIOLOGY**

*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.

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

**(a)** difficulties with specimens or materials;

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**(b)** accidents to apparatus or materials;

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**(c)** assistance provided in the case of colour blindness;

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

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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 sight of the candidates**, carry out the practical aspects of **Question 1** using the same apparatus and reagents as the candidates. Results should be recorded in the space on page **8** (**not** on a spare question paper). Attach extra sheets if necessary.

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



- 4 A plan of work benches, giving details of the candidate numbers of the places occupied by the candidates for each session, must be enclosed with the scripts.

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

The preparation of this practical 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 to be despatched in more than one packet, it is essential that a copy of the Supervisor's Report and the appropriate seating plan(s) are inside **each packet**.

