Cambridge International AS & A Level

**Cambridge Assessment International Education**
Cambridge International Advanced Subsidiary and Advanced Level

**BIOLOGY** **9700/35**

Paper 3 Advanced Practical Skills 1 **May/June 2019**

MARK SCHEME

Maximum Mark: 40

**Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

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## Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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| GENERIC MARKING PRINCIPLE 5:<br><br>Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen). |
| GENERIC MARKING PRINCIPLE 6:<br><br>Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind. |

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**Mark scheme abbreviations**

| | |
|---|---|
| **;** | separates marking points |
| **/** | alternative answers for the same point |
| **R** | reject |
| **A** | accept (for answers correctly cued by the question, or by extra guidance) |
| **AW** | alternative wording (where responses vary more than usual) |
| **underline** | actual word given must be used by candidate (grammatical variants accepted) |
| **max** | indicates the maximum number of marks that can be given |
| **ora** | or reverse argument |
| **mp** | marking point (with relevant number) |
| **ecf** | error carried forward |
| **I** | ignore |
| **AVP** | alternative valid point |

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| Question | Answer | Marks |
|---|---|---|
| 1(a)(i) | 1. 0.5%, 0.25%, 0.125% and 0.0625% (labels under the 2nd, 3rd, 4th and 5th beakers) **;**<br>2. shows transfer of 10 $cm^3$ from 1st beaker to 2nd beaker and 10 $cm^3$ from 2nd beaker to 3rd beaker and 10 $cm^3$ from 3rd beaker to 4th beaker **;**<br>3. shows 10 $cm^3$ of **W** added to 2nd, 3rd and 4th beakers **;** | **3** |
| 1(a)(ii) | 1. heading for percentage concentration of protein ;<br>2. heading for colour ;<br>3. records results for at least four concentrations of protein ;<br>4. uses letters for the colours for all the concentrations ;<br>5. shows correct trend ; | **5** |
| 1(a)(iii) | states the colour for **U** ; | **1** |
| 1(a)(iv) | shows an estimate of the concentration of protein in **U ;** | **1** |
| 1(a)(v) | 1. makes a range of concentrations of protein solutions with narrower intervals **;**<br>2. uses proportional dilution **;** | **2** |
| 1(a)(vi) | colorimeter **;** | **1** |
| 1(b)(i) | 84 ; | **1** |

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| Question | Answer | Marks |
|---|---|---|
| 1(b)(ii) | 1. *x*-axis labelled as time / days **+** *y*-axis labelled as concentration of protein in blood plasma / g $dm^{-3}$ ;<br><br>2. scale on *x*-axis is 2 to 2 cm, labelled at least every 2 cm **+**<br>scale on *y*-axis is 20 to 2 cm, labelled at least every 2 cm ;<br><br>3. points plotted accurately with a small cross or a small dot in a circle ;<br><br>4. five points connected plot to plot **or** with a line of best fit ; | **4** |
| 1(b)(iii) | *any 3 from:*<br><br>1. the increase in the concentration of protein in blood plasma was caused by bacteria / bacterium / virus / foreign antigen **;**<br><br>2. correct reference to plasma cells **;**<br><br>3. production of antibodies **;**<br><br>4. antibodies are proteins **;** | **3** |

| Question | Answer | Marks |
|---|---|---|
| 2(a)(i) | ***L1** is TS beech leaf*<br>1. minimum size **+** at least two layers of tissue **;**<br>2. draws only the midrib **;**<br>3. correct proportion of the vascular area to the other tissues **;**<br>4. shows subdivision of the vascular tissue **;**<br>5. draws at least three layers of tissue **;**<br>6. label line and label to identify the upper epidermis **;** | **6** |
| 2(a)(ii) | 1. minimum cell size **+** lines thin and continuous **;**<br>2. draws only four cells **+** each cell touching at least one other cell **;**<br>3. draws at least one cell longer than it is deep **;**<br>4. two lines drawn around each cell, three lines where cells touch **;**<br>5. label line and label to identify the cell wall **;** | **5** |
| 2(b) | 1. measures depth of midrib along line **X** within range **+** units **;**<br>2. shows conversion from mm to µm by multiplying by 1000 **;**<br>3. shows division by 14 **;**<br>4. correct answer **;**<br>5. answer stated to the appropriate degree of accuracy **;** | **5** |

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| Question | Answer | Marks |
|---|---|---|
| 2(c) | records three observable differences between **L1** and Fig. 2.3 **; ; ;**<br>e.g. **L1** has more vascular bundles than Fig. 2.3<br>**L1** has more midribs than Fig. 2.3<br>**L1** has a thicker epidermis than Fig. 2.3 | **3** |

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