Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/33**

Paper 3 Advanced Practical Skills 1 **October/November 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.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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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: 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: 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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Question	Answer	Marks
1(a)(i)	assesses the risk for **E** as medium or high, for **S** as low and for **C** as medium or high **;**	**1**
1(a)(ii)	1 0.2%, 0.02%, 0.002%, 0.0002% (labels under correct sequence of beakers) **;** 2 shows transfer of 1 (cm^3) copper sulfate solution to each beaker from the previous beaker **;** 3 shows 9 (cm^3) of water added to each beaker **;** *max 2 if cm^3 omitted from mp2 and mp3*	**3**
1(a)(iii)	1 *heading for independent variable*: percentage concentration copper sulfate solution **and** before heading for dependent variable **and** no units in body of table **;** 2 *heading dependent variable*: time and seconds **and** no units in body of table **;** 3 readings for all samples **;** 4 time for iodine to remain yellow increases with increasing concentration **;** 5 results recorded to nearest whole second **;**	**5**
1(a)(iv)	records result for **U and** seconds **;**	**1**
1(a)(v)	correctly estimates the concentration of copper sulfate in **U ;**	**1**
1(a)(vi)	*any **one** from*: 1 difficulty in judging exact time of colour change **;** 2 colour may change between time intervals **;** 3 using glass rod causes drop sizes to be of unequal sizes **;**	**1**
1(a)(vii)	*any **one** from :* more concentrations between the two concentrations that lie each side of the estimate **;** AVP **;**	**1**
1(a)(viii)	*any **two** from:* 1 use colorimeter **;** 2 standard colours to compare **;** 3 more intermediate times **;** 4 choose end point that is dark brown **;** 5 use pipette for iodine or sample **;**	**2**

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Question	Answer	Marks
1(b)(i)	1 *x*-axis: temperature / °C **and** *y*-axis: rate of reaction / arbitrary units **;** 2 scale on *x*-axis: 10 °C to 2 cm, labelled at least every 2 cm **and** scale on *y*-axis: 50 arbitrary units to 2 cm, labelled at least every 2 cm **;** 3 correct plotting of all five points using small crosses or dots in circles **;** 4 five plots joined with thin line passing through all points and line is either smooth curve or joined plot to plot **;**	**4**
1(b)(ii)	correct value from graph **;**	**1**
1(b)(iii)	*any **three** from:* 1 *(between 5.5 °C and 36 °C)* enzyme and substrate have more kinetic energy **;** 2 more successful collisions or more enzyme substrate complexes formed **;** 3 *(between 36 °C and 49.5 °C)* shape of the active site changes or enzyme dentures **;** 4 fewer enzyme substrate complexes formed **;**	**3**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(a)(i)</td><td>1 suitable size and no shading and no cells ;
2 draws whole leaf and closed at both ends ;
3 draws minimum number of tissues ;
4 correct proportions of vascular bundle to depth of lamina ;
5 label line and label to epidermis ;</td><td>5</td></tr>
<tr><td>2(a)(ii)</td><td>1 lines continuous, thin and sharp ;
2 draws only four whole cells and each cell touches at least one other ;
3 two lines around each cell and three lines where cells touch ;
4 label line and label to one cell wall ;</td><td>4</td></tr>
<tr><td>2(b)(i)</td><td>1 measures and records length of line X-Y and units ;
2 measurement of line X-Y divided by 74 ;
3 units (mm or µm) for final correct answer ;</td><td>3</td></tr>
<tr><td>2(b)(ii)</td><td>shows addition of five numbers and shows division by 5 ;</td><td>1</td></tr>
<tr><td>2(b)(iii)</td><td>1 organises comparison into three columns with one column for features and collects only differences ;
any three from:
<table>
<tr><th>feature</th><th>K1</th><th>Fig. 2.1</th></tr>
<tr><td>vascular tissue</td><td>flatter /
more oval</td><td>rounder ;</td></tr>
<tr><td>air spaces</td><td>more / larger</td><td>fewer / smaller ;</td></tr>
<tr><td>epidermis</td><td>thinner</td><td>thicker ;</td></tr>
<tr><td>ring of cells around vascular tissue</td><td>absent</td><td>present ;</td></tr>
<tr><td>cuticle</td><td>thicker / present</td><td>thinner / absent ;</td></tr>
<tr><td>AVP</td><td>described</td><td>described ;</td></tr>
</table></td><td>4</td></tr>
</table>

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