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 **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.

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.

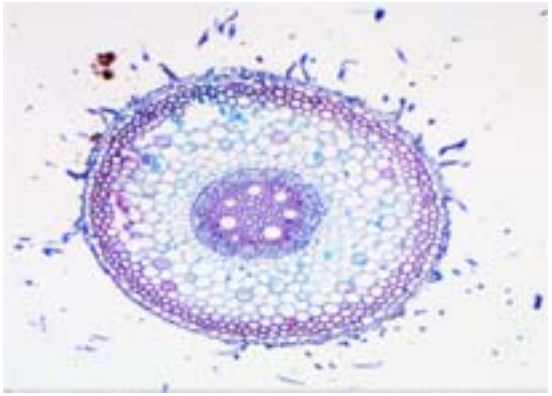
GENERIC MARKING PRINCIPLE 4:

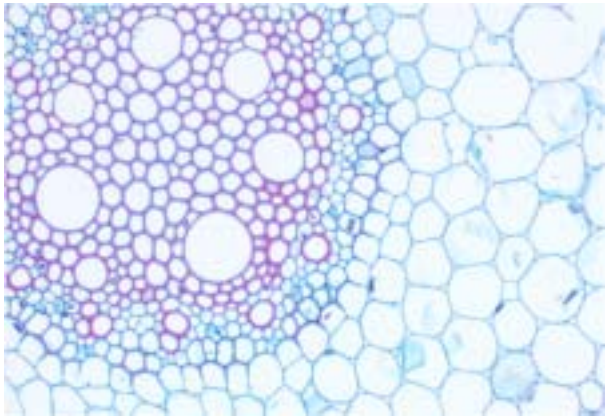
Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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.

Question	Answer	Marks
1(a)(i)	4 more sizes **;** all are cubes equal length × width × depth **;** all calculations correct **;**	**3**
1(a)(ii)	1. (heading) surface area:volume **;** 2. (heading for dependent) time **+** units 3. collects results for all different size cubes **;** 4. records all results using whole seconds **;**	**4**
1(a)(iii)	correct trend from candidates own results **;**	**1**
1(a)(iv)	repeat at least twice more **;**	**1**
1(a)(v)	replace ascorbic acid / **A** with water **;**	**1**
1(a)(vi)	*any **two** from:* 1. further diffusion distance **;** 2. idea of not enough oxygen / nutrients / named nutrient reaching the centre of the organism **;** 3. limits the activity / size of the organism **or** larger organisms need a transport system **;**	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1(b)(i)</td><td>
<table>
<tr><td>the agar block, B, had lumps in it where it was not dissolved properly</td><td>random + the idea of cubes with less lumps would have a much quicker diffusion time ;</td></tr>
<tr><td>it was difficult to judge the end-point</td><td>random + idea of judging the end-point before true end-point for some cubes and after for other cubes
or
systematic + no effect as the same individual would judge the same end-point ;</td></tr>
</table>
</td><td>2</td></tr>
<tr><td>1(b)(ii)</td><td>appropriately sized cube from candidates results + units ;</td><td>1</td></tr>
<tr><td>1(b)(iii)</td><td>5 different concentrations ;
using serial or proportional dilution ;</td><td>2</td></tr>
<tr><td>1(c)(i)</td><td>0.31 ;</td><td>1</td></tr>
<tr><td>1(c)(ii)</td><td>1. label on x-axis plant extract + label on y-axis ascorbic acid concentration (/) mg cm^{-3} ;
2. scale on x-axis labelled bars of same width + scale on y-axis is 0.2 to 2 cm + labelled each 2 cm ;
3. correct plotting of 5 bars ;
4. smooth sharp lines + bars separated equally ;</td><td>4</td></tr>
</table>

Question	Answer	Marks
2(a)(i)	***L1*** *TS Wheat root*  1. suitable size **+** no shading **+** no cells **;** 2. whole root section drawn **+** at least 3 lines **;** 3. correct root shape **+** at least 5 lines across width of section from the centre of drawing **+** thin epidermis layer **;** 4. correct proportion of the diameter of the central region to the total diameter of the root **;** 5. label line and label to epidermis **;**	**5**

Question	Answer	Marks
2(a)(ii)	 1. lines continuous, thin and sharp ; 2. draws only 4 whole cells + each cell touching at least two of the other cells ; 3. two lines drawn around each cell + three lines where two cells touch ; 4. smaller cell at least half the size of the larger cell ; 5. draws cells the correct shape ; 6. label line and label to lumen ;	**6**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(b)(i)</td><td>anaphase ;

chromatids have separated and moved towards the <u>poles</u> ;</td><td>2</td></tr>
<tr><td>2(b)(ii)</td><td>3 or 4 ;</td><td>1</td></tr>
<tr><td>2(b)(iii)</td><td>mp1 correct measurement of line R + units ;

<table>
<tr><td>mp2</td><td>conversion of line R</td><td>conversion of actual cell Q length</td></tr>
<tr><td></td><td>(mm)
shows (whatever measurement of R) multiplied by 1000
or
(cm)
shows (whatever measurement of R) multiplied by 10 000 ;</td><td>(mm)
shows 41.6 divided by 1000
or
(cm)
shows 41.6 divided by 10 000 ;</td></tr>
<tr><td>mp3</td><td>shows (measurement of R) divided by 41.6 ;</td><td>shows (measurement of R) divided by 0.0416
or
shows (measurement of R) divided by 0.00416 ;</td></tr>
</table>

mp4 correct answer ;</td><td>4</td></tr>
</table>