Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/34**

Paper 3 Advanced Practical Skills 2 **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.

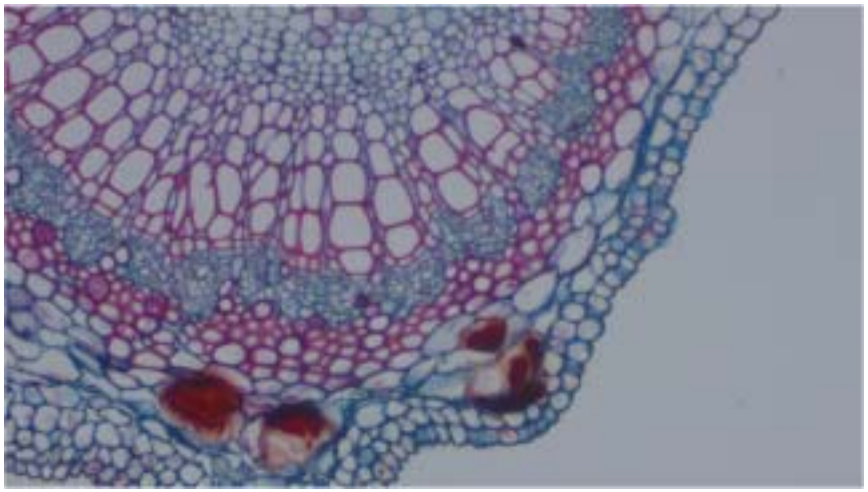
GENERIC MARKING PRINCIPLE 4:

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

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)	collects three lengths within the range given as whole numbers or to 0.5 ;	**1**
1(a)(ii)	cut all to same length ;	**1**
1(a)(iii)	stated volume of buffer ;	**1**
1(a)(iv)	1. (heading) pH ; 2. (heading for dependent) colour intensity ; 3. collects results for 5 pH values ; 4. correct trend in results ; 5. results recorded using (**++**) scale ;	**5**
1(a)(v)	uses symbols to record results ;	**1**
1(a)(vi)	correct answer from candidates results ;	**1**
1(a)(vii)	colour standards **or** colorimeter **or** use more intermediate pH values ;	**1**
1(a)(vii)i	use a thermostatically controlled water-bath ; use at least 5 different temperatures ;	**2**
1(b)(i)	1. label on *x*-axis soil pH **+** label on *y*-axis mean mass of grass (/) g ; 2. scale on *x*-axis 0.5 to 2 cm **+** labelled each 2 cm **+** scale on *y*-axis is 1 to 2 cm **+** labelled each 2 cm ; 3. correct plotting of 5 points with a small cross or dot in circle ; 4. smooth line, joined point to point, through 5 points / curve or line of best fit ;	**4**

Question	Answer	Marks
1(b)(ii)	as the pH increases the mass of grass increases ; idea that the mass increases at a decreasing rate or correct data quotes to illustrate the trend ;	**2**
1(b)(iii)	denatures proteins ; reduced absorption of minerals by active transport ;	**2**
2(a)(i)	***M1*** *TS Tilia Leaf*  1. midrib minimum depth at least 90 mm **+** no shading **+** no cells ; 2. correct section drawn ; 3. vascular bundle correctly subdivided into at least 3 layers ; 4. correct proportion of the vascular tissue the other tissues ; 5. label line and label to lower epidermis ;	**5**

Question	Answer	Marks
2(a)(ii)	 1. all lines should be continuous, thin and sharp **+** minimum size **;** 2. draws only 4 whole cells **+** each cell touching at least one of the other cells **;** 3. two lines drawn around each cell **+** three lines where two cells touch **;** 4. draws cells the correct shape **;** 5. label line and label to cell wall **;**	**5**
2(b)	thick cell wall **or** has lumen **or** is hollow **;**	**1**
2(c)(i)	measures **L** (within range) **+** units (mm **or** cm) **;** records the number of eyepiece graticule units (within range) **;** shows eyepiece graticule units multiplied by 15 **;** correct answer from their eyepiece graticule units measurements **+** correct units **;**	**4**

Question	Answer	Marks
2(c)(ii)	shows depth of **Fig 2.3** divided by answer to **(c)(i) ;**	**1**
2(c)(iii)	annotates 3 correct features on **Fig 2.3** using labels **R**, **S** and **T ;;;** e.g. **Fig 2.3** is more rounded than **J1**	**3**