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 2018**

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 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

© UCLES 2018

PUBLISHED

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.

© UCLES 2018

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.

© UCLES 2018

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

© UCLES 2018

Question	Answer		Marks
1(a)(i)	mp 1	records a higher volume of iodine for sample **A** than **W** ;	**1**
1(a)(ii)	mp 1	0.08, 0.06, 0.04, 0.02 ;	**2**
	mp 2	correct volumes of **A** and **W**, that add up to 20 cm^3 ;	
1(a)(iii)	mp 1	heading for 'percentage concentration of ascorbic acid / **A**', to left of data and separated by a line from data ;	**4**
	mp 2	heading for 'volume of iodine / cm^3 ' ;	
	mp 3	volumes for at least 5 concentrations **+** correct trend ;	
	mp 4	records volumes to 1 or 2 decimal places ;	
1(a)(iv)	mp 1	records volume of **X** being larger than the volume of **Y +** units ;	**1**
1(a)(v)	mp 1	concentrations from Table 1.2 written on the line **+** correct estimation of concentration of **X** and **Y** on scale bar from candidates results ;	**1**
1(a)(vi)	*any one from*		**1**
	mp 1	drops stick to the side of the tube so the volume is not accurate ;	
	mp 2	difficulty of judgement / identification of appearance of first colour change ;	
	mp 3	drop size / different pressure on syringe / syringe sticking / mixing ;	
	mp 4	iodine evaporating / exposed to light ;	
	mp 5	(ascorbic acid) evaporates or mixes with air so the concentration changes ;	
	mp 6	to narrow a range of ascorbic acid concentrations ;	
	mp 7	iodine came out faster than water ;	

© UCLES 2018

Question	Answer	Marks
1(a)(vii)	*any three from* mp 1 more concentrations or narrower range of concentrations (ascorbic acid) **;** mp 2 use graduated pipette / syringe / burette, with smaller divisions **;** mp 3 use colorimeter or have a standard colour to compare **;** mp 4 put drops in nearer to mixture or use a smaller, test-tube / container **;** mp 5 replicate / repeat / take more readings (each concentration) **;** mp 6 plot a graph and read off from the graph **;** mp 7 use a, wider / larger test-tube / boiling tube / beaker **;** mp 8 idea of keeping iodine away from light **;**	**3**
1(b)(i)	mp 1 label on *x*-axis, 'percentage concentration of ascorbic acid' **+** label on *y*-axis, 'mass of maltose produced / mg' **;** mp 2 scale on *x*-axis is 0.002 to 2 cm **+** *y*-axis is 20 to 2 cm **+** labelled at least each 2 cm **;** mp 3 correct plotting of six points with a small cross or dot in circle **;** mp 4 line sharp and joined point to point **;**	**4**
1(b)(ii)	mp 1 shows on graph how to read off from 0.005% **;** mp 2 correctly reads from graph the mass of maltose **+** mg **;**	**2**

© UCLES 2018

Question	Answer	Marks
1(b)(iii)	*any three from* *idea of inhibitor* mp 1 idea of ascorbic acid acts as an inhibitor ; mp 2 binds to the enzyme / active site ; mp 3 changes the shape of the active site (if non-competitive inhibitor) / or competes with substrate for active site (if competitive inhibitor) ; mp 4 prevents the substrate from binding ; mp 5 less enzyme substrate complexes formed ; **or** *Idea of ascorbic acid changing the pH* mp 1 more ascorbic acid present lowers the pH ; mp 2 enzyme becomes inactive / denatured as pH is lowered ; mp 3 changes the shape of the active site ; mp 4 prevents the substrate from binding ; mp 5 less enzyme substrate complexes formed ;	**3**

© UCLES 2018

Question	Answer	Marks
2(a)(i)	TS Maize root mp 1 minimum size **+** at least three lines **+** no cells **;** mp 2 draws at least 5 layers **;** mp 3 correct proportion of vascular tissue to width of whole root **;** mp 4 label line and label to identify the cortex **;**	**4**
2(a)(ii)	mp 1 minimum cell size **+** lines thin and continuous **+** no shading **;** mp 2 only 4 cells drawn **+** each cell touching at least one of the other cells **;** mp 3 cell walls drawn as two lines **;** mp 4 two lower cells wider than each of the epidermal cells **;** mp 5 label line and label to identify the cell wall **;**	**5**
2(b)	mp 1 correct measurement of vascular tissue **;** mp 2 correct measurement of the whole root **;** mp 3 all measurements using the same units (mm / cm) **;** mp 4 shows a larger number to a smaller number **;** mp 5 displays ratio to the lowest common denominator **;**	**5**
2(c)	mp 1 organises comparison into three columns with one column for features, one headed **M1** and one headed Fig. 2.1 **+** recording only differences not similarities **;** mp 2, mp 3, mp4 three correct differences **;;;** e.g. air spaces smaller in M**1** while in Fig 2.1 they are larger	**4**