Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/32**

Paper 3 Advanced Practical Skills 2 **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: 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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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. four stated percentage concentrations of sucrose solution, 8.0 / 8%, 6.0 / 6%, 4.0 / 4% and 2.0 / 2% **;** 2. correct volumes of **S** and **W** to make up the four stated concentrations **;**	**2**
1(a)(ii)	1. heading for percentage concentration of sucrose **;** 2. heading for time / seconds **;** 3. records results for at least four concentrations of sucrose **;** 4. shows correct trend **;** 5. records whole seconds **;**	**5**
1(a)(iii)	states the result for **U +** units **;**	**1**
1(a)(iv)	states whether **U** is taken from the phloem of a plant treated with fusicoccin **+** reference to the concentration of sucrose in **U** ;	**1**
1(a)(v)	1. makes a range of concentrations of sucrose with narrower intervals **;** 2. uses proportional dilution **;**	**2**
1(a)(vi)	**G** was acting as a control **;**	**1**
1(b)(i)	1. *x*-axis labelled as time / min **+** *y*-axis labelled as rate of mass flow / $cm^3 min^{-1}$ **;** 2. scale on *x*-axis is 50 to 2 cm, labelled at least every 2 cm **+** scale on *y*-axis is 5 to 2 cm, labelled at least every 2 cm **;** 3. five points plotted accurately with a small cross or a small dot in a circle **;** 4. five points connected plot to plot or with a line of best fit **;**	**4**
1(b)(ii)	1. 20 $cm^3 min^{-1}$ **;** 2. shows on graph from *y*-axis to *x*-axis **;**	**2**

Question	Answer	Marks
1(b)(iii)	increase the rate of mass flow ;	**1**
1(b)(iv)	*any two from:* 1. *ref. to* transport of sucrose via plasmodesmata ; 2. *ref. to* fusicoccin binding to receptors of companion cell ; 3. *ref. to* active transport of hydrogen ions protons ; 4. *ref. to* cotransporters (sucrose and hydrogen ions) ;	**2**

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Question	Answer	Marks
2(a)(i)	***M1*** *is TS Bryony stem* 1. minimum size **+** at least two layers of tissue ; 2. draws part of stem **+** only three vascular bundles ; 3. correct proportion of vascular tissue to the width of the plant organ ; 4. draws at least three layers of tissue ; 5. label line and label to identify the epidermis ;	**5**
2(a)(ii)	1. minimum cell size **+** lines thin and continuous ; 2. draws only four cells **+** each cell touching at least two others ; 3. draws two epidermal cells **+** two adjacent cells on the layer below the epidermis ; 4. two lines drawn around each cell, three lines where cells touch ; 5. label line and label to identify the cell wall ;	**5**
2(b)(i)	organ identified as a stem **+** one observable feature supporting identification e.g. vascular bundles located around outside / near the epidermis ;	**1**
2(b)(ii)	1 uses line **Z** to measure the length of the vascular bundle within range ; 2 show conversion from mm to µm (×1000) ; 3 shows division by 20 ; 4 decides to give answer in µm or mm ; 5 answer stated to the appropriate degree of accuracy ;	**5**

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Question	Answer	Marks
2(b)(iii)	graticule **or** stage micrometer **;**	**1**
2(c)	records two observable differences between **M1** and Fig. 2.1 **; ;** e.g. **M1** has fewer vascular bundles than Fig. 2.1 **M1** has scattered vascular tissue while in Fig. 2.1 it is located towards the epidermis	**2**

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