Cambridge International AS & A Level

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BIOLOGY **9700/33**

Paper 3 Advanced Practical Skills 1 **May/June 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.

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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)	correct volumes of **S5** for three concentrations of sucrose, **S4**, **S3** and **S2** (8, 6,4) **;** correct volumes of water for **S4**, **S3** and **S2** (2, 4, 6) **;**	**2**
1(a)(ii)	heading for percentage concentration of sucrose **;** heading for time / seconds **;** times for all concentration of sucrose (**S5**, **S4**, **S3**, **S2**) **;** time for the highest concentration of sucrose recorded as the shortest time **;** seconds recorded as whole numbers **;**	**5**
1(a)(iii)	states time for **U +** decides on the estimate of the percentage concentration of sucrose solution for **U +** shows **U** on the scale **;**	**1**
1(a)(iv)	scale on *x*-axis 1.0 to 2 cm **+** sensible scale used for *y*-axis**;** thin line passing through plots **;**	**2**
1(a)(v)	correct estimate for the percentage concentration of sucrose in **U** from the graph **;**	**1**
1(a)(vi)	difficulty of identifying appearance of the first colour change / AVP **;**	**1**
1(a)(vii)	increase the number of percentage concentrations of sucrose solution below 2% **;** use at least 5 percentage concentrations of sucrose solution below 2% **;** AVP **;** e.g. difference between concentrations to be as small as possible	**3**
1(b)(i)	shows addition of the five figures (13.6, 12.2, 3.4, 2.0, 0.4) **;** divides total by 55 **and** multiplies by 100 **;** answer given to the correct degree of accuracy **;**	**3**

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Question	Answer	Marks
1(b)(ii)	label on *x*-axis type of sugar in the fruit **+** label on *y*-axis mass of sugar in 55 g fruit / g **;** correct plotting of 5 bars **;**	**2**
1(b)(iii)	(source) leaves / AVP **;** (process) active transport / AVP **;**	**2**

Question	Answer	Marks
2(a)(i)	1 minimum size **+** no shading **+** no cells **;** 2 draws sector including epidermis and vascular bundles **;** 3 draws one outer vascular bundle **+** 3 inner vascular bundles **;** 4 shows subdivision of vascular bundles **;** 5 label line and label to identify the cortex **;**	**5**
2(a)(ii)	measurement of **L** and **D** as instructed **+** records as whole **or** to half number **;**	**1**
2(a)(iii)	1 minimum cell size **+** lines thin and continuous **;** 2 only 4 cells drawn **+** each cell touching at least one of the other cells **;** 3 correct proportion (depth and length) of cells **;** 4 correct shape of cells **;** 5 label line and label to identify the cell wall **;**	**5**
2(a)(iv)	aquatic habitat / AVP **;**	**1**
2(b)	states the correct number of eyepiece graticule units for **X**–**Y** **;** shows multiplication of the number of eyepiece graticule units for **X**–**Y** by 29.5 **;** answer to the correct degree of accuracy + µm **;**	**3**
2(c)	*any three* correct annotations **; ; ;** e.g. in **K1** vascular bundles touching while in Fig. 2.3 vascular bundles separated from each other	**3**

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