Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/31**

Paper 3 Advanced Practical Skills 1 **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.

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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)	mp 1	draws on test-tube **B** a line level with liquid in test tube **A** and a layer indicating level of sediment at bottom **;**	**2**
	mp 2	label line and label to sediment **;**	
1(a)(ii)	mp 1	describes how to count squares on graph paper scale to measure height of sediment **;**	**1**
1(a)(iii)	mp 1	states at least 4 regular time intervals **;**	**1**
1(a)(iv)	mp 1	records results using heading pH **;**	**5**
	mp 2	uses heading height of sediment / mm **;**	
	mp 3	records heights of sediment at each time interval for each pH **;**	
	mp 4	results show expected pattern, pH 3 or pH 4 greatest height of sediment **;**	
	mp 5	results as whole numbers **;**	
1(a)(v)	mp 1	records height of sediment at each time interval for **BU** **;**	**2**
	mp 2	estimates pH according to candidate's results **;**	
1(a)(vi)	mp 1	suggests using at least 5 pH values **;**	**2**
	mp 2	suggests comparison with results for known pH values **;**	
1(a)(vii)	mp 1	suggests at the pH where greatest sedimentation occurred yeast cells were more attracted towards each other causing yeast to stick together and drop to bottom **;**	**1**
1(a)(viii)	mp 1	identifies a source of error such as the difficulty of determining the boundary of the sediment **;**	**1**

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Question	Answer		Marks
1(b)(i)	mp 1	*x*-axis: labelled time / hours, *y*-axis: labelled number of yeast cells / arbitrary units cm^{-3} ;	**4**
	mp 2	scale on *x*-axis is 5 to 2 cm, scale on *y*-axis is 200 to 2 cm labelled each 2 cm ;	
	mp 3	correct plotting of 5 points with a cross or dot in circle, to within half a square ;	
	mp 4	five plots, joined point to point, with a thin line ;	
1(b)(ii)	mp 1	shows on graph how to find the number of yeast cells at 18 hours ;	**2**
	mp 2	correct answer according to candidate's graph ;	

Question	Answer		Marks
2(a)(i)	mp 1	drawing of a minimum size with a minimum number of tissue layers and no cells drawn ;	**5**
	mp 2	draws correct quarter of the stem ;	
	mp 3	draws at least 4 layers of tissue ;	
	mp 4	draws irregular outline of vascular tissue layer ;	
	mp 5	uses label line and label to identify the xylem ;	
2(a)(ii)	mp 1	drawing of a minimum size and drawn with thin, continuous lines ;	**5**
	mp 2	draws only four touching cells ;	
	mp 3	two lines drawn around each cell and one cell with angular sides ;	
	mp 4	each cell touching at least two of the other cells ;	
	mp 5	uses label line and label to identify the cell wall ;	

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Question	Answer	Marks
2(b)(i)	mp 1 measures the line **X** within range and with units **;** mp 2 shows measurement of **X** (mm) multiplied by 1000 **;** mp 3 shows division by 13 **;** mp 4 shows answer to correct degree of accuracy **;**	**4**
2(b)(ii)	mp 1 count number of eyepiece graticule units equivalent to the length of the vascular bundle and using a calibration technique to determine the actual length **;**	**1**
2(c)	mp 1 organises table into three columns with one column for feature **;** mp 2, mp 3, mp 4 three observable differences between the stem on **J1** and the stem in Fig. 2.2 such as the vascular bundles are joined in **J1** and separate in Fig. 2.2 **;;;**	**4**

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