



Cambridge
International
AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY

9700/33

Paper 3 Advanced Practical Skills 1

October/November 2016

MARK SCHEME

Maximum Mark: 40

Published

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This document consists of **5** printed pages.

Page 2	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
1(a)	<i>(layout of drawing)</i> - quality of line for outer wall of cell thin and sharp + large size ; - only one cell drawn + shows plasmolysis ; - cell wall drawn as two lines close together ; - uses one label line + one label to cell surface membrane ;	4
1(b)(i)	<i>(decisions on serial dilutions)</i> - correct concentrations of 0.5, 0.25, 0.125, 0.0625 + mol dm⁻³ ; - shows transfer of 10 cm³ of 1 mol dm⁻³ to next dilution + 10 cm³ transferred from 2nd to 3rd beaker and from 3rd to 4th and from 4th to 5th + cm³ ; - adds 10 cm³ of water to each beaker ;	3
1(b)(ii)	<i>(recording results)</i> - table drawn + heading, concentration + sucrose + mol dm⁻³ ; - heading, time + seconds ; - records results for at least four concentrations ; - correct pattern of results, the highest concentration of sucrose recorded as the shortest time for colour change ; - times recorded as whole seconds ;	5

Page 3	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
1(b)(iii)	<i>(records time for U)</i> appropriate number for time + seconds ;	1
1(b)(iv)	<i>(interpretation of estimate)</i> correct answer in accordance with recorded times ;	1
1(b)(v)	<i>(improvements to procedure)</i> <i>three from</i> 1 increased number of concentrations ; 2 between named concentrations or use simple (proportional) dilution ; 3 repeat or replicate ; 4 weigh mass of precipitate ;	3
1(c)(i)	<i>(layout of data)</i> 1 (x-axis) concentration of sucrose solution / mol dm ⁻³ + (y-axis) water potential / kPa ; 2 correct plotting of five points with a small cross or dot in circle ; 3 five plots joined point to point or as a line of best fit drawn as a ruled thin line ;	3
1(c)(ii)	<i>(interpretation of concentration)</i> correctly reads value for the water potential of the concentration of sucrose at 0.66 mol dm ⁻³ + minus sign ;	1

Page 4	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
1(c)(iii)	<i>(conclusions)</i> 1 (cells) reference to higher water potential than solution ; 2 water moves out of cells ; 3 by osmosis ;	2
	Total:	23

Question	Answer	Mark
2(a)(i)	<i>(decisions)</i> 1 same number of drops or stated number of drops or volume (of sample) ; 2 add same number of drops or stated number of drops or volume (of iodine) ;	2
2(a)(ii)	<i>(recording results)</i> 1 heading, colour or observation ; 2 records colour results for three samples ; 3 records P2 as darkest blue (or black) ;	3
2(a)(iii)	<i>(conclusion)</i> P2 ;	1

Page 5	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
2(b)	<i>(plan drawing)</i> 1 large size + no shading ; 2 no cells + at least three lines drawn ; 3 draws outline of root cap + draws outline of stele ; 4 stele shown in correct proportion ; 5 uses one label line + one label, the letter T, to region of cortex ;	5
2(c)(i)	<i>(actual width of cells)</i> 1 measures length of scale bar + units ; 2 for calculation shows length of scale bar used with measurements of cells ; 3 correct answers to calculation for all cells ;	3
2(c)(ii)	<i>(mean actual width of cells)</i> 1 shows addition of five measurements from (c)(i) + divided by 5 ; 2 correct answer to appropriate degree of accuracy ;	2
2(c)(iii)	<i>(interpretation)</i> one observable difference between the cell D and cell E ;	1
	Total:	17