

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

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Question	Answer	Mark
1(b)(iii)	(records time for U) appropriate number for time + seconds ;	1
1(b)(iv)	(interpretation of estimate) correct answer in accordance with recorded times ;	1
1(b)(v)	(improvements to procedure) <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)	(layout of data) 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)	(interpretation of concentration) correctly reads value for the water potential of the concentration of sucrose at 0.66 mol dm^{-3} + minus sign ;	1

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

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

Page 5	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
2(b)	<p><i>(plan drawing)</i></p> <p>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 ;</p>	5
2(c)(i)	<p><i>(actual width of cells)</i></p> <p>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 ;</p>	3
2(c)(ii)	<p><i>(mean actual width of cells)</i></p> <p>1 shows addition of five measurements from (c)(i) + divided by 5 ; 2 correct answer to appropriate degree of accuracy ;</p>	2
2(c)(iii)	<p><i>(interpretation)</i></p> <p>one observable difference between the cell D and cell E ;</p>	1
	Total:	17