Cambridge International AS & A Level

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BIOLOGY **9700/33**

Paper 3 Advanced Practical Skills 1 **October/November 2016**

MARK SCHEME

Maximum Mark: 40

Published

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Question	Answer	Mark
1(a)	*(layout of drawing)* 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 ;	**4**
1(b)(i)	*(decisions on serial dilutions)* 1 correct concentrations of 0.5, 0.25, 0.125, 0.0625 + mol dm^{-3} ; 2 shows transfer of 10 cm^3 of 1 mol dm^{-3} to next dilution + 10 cm^3 transferred from 2nd to 3rd beaker and from 3rd to 4th and from 4th to 5th + cm^3 ; 3 adds 10 cm^3 of water to each beaker ;	**3**
1(b)(ii)	*(recording results)* 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 ;	**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)* *three from* 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)	*(conclusions)* 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)	*(decisions)* 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)	*(recording results)* 1 heading, colour or observation **;** 2 records colour results for three samples **;** 3 records **P2** as darkest blue (or black) **;**	**3**
2(a)(iii)	*(conclusion)* **P2 ;**	**1**

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

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