

BIOLOGY

9700/36 October/November 2016

Paper 3 Advanced Practical Skills 2 MARK SCHEME Maximum Mark: 40

Published

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International Examinations

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Question	Answer	Mark
1(a)	(risk assessment)	1
	irritant+medium risk;	
1(b)(i)	(decisions on serial dilutions)	3
	1 correct concentrations of 0.5, 0.25, 0.125, 0.0625+%;	
	2 shows transfer of 20 cm ³ of 1% to next dilution + 20 cm ³ transferred from 2nd to 3rd beaker and from 3rd to 4th and from 4th to 5th + cm ³ ;	
	3 adds 20 cm ³ of water to each beaker ;	
1(b)(ii)	(recording results)	5
	1 table drawn + heading, percentage concentration of antibiotic;	
	2 heading, time + seconds;	
	3 records results for at least four concentrations;	
	4 correct pattern of results, the highest concentration of antibiotic recorded as the shortest time for colour change ;	
	5 times recorded as whole seconds ;	
1(b)(iii)	(records time for U)	1
	appropriate number for time + seconds;	
1(b)(iv)	(interpretation of estimate)	1
	correct estimate in accordance with recorded times;	

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Question	Answer	Mark
1(b)(v)	(source of error with reason)	1
	appropriate error with reason e.g. colour + difficult to judge;	
1(b)(vi)	(modification to investigate another variable)	3
	 (to standardise concentration of antibiotic) uses stated concentration of antibiotic or uses same concentration of antibiotic ; 	
	2 (changes independent variable-temperature) at least five temperatures ;	
	3 (method) uses thermostatically controlled water-bath ;	
1(c)(i)	(layout of data)	4
	 1 (x-axis) external concentration of glucose/mmoldm⁻³ + (y-axis) rate of glucose uptake by cells/mmolcm⁻³ hr⁻¹; 	
	 2 (scale on x-axis) 5 to 2 cm, labelled at least each 2 cm + (scale on y-axis) 100 to 2 cm, labelled at least each 2 cm ; 	
	3 correct plotting of five points with a small cross or dot in circle ;	
	4 five plots joined point to point, drawn as a thin line;	
1(c)(ii)	(interpretation)	1
	correctly reads value for rate of glucose uptake from graph at 7 mmol dm^{-3} ;	

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Question	Answer	Mark
1(c)(iii)	(conclusion)	2
	1 reference to carrier proteins/channel proteins;	
	 2 (at low concentrations of external glucose) carrier proteins available or (at high concentrations of external glucose) limited availability of carrier proteins ; 	
	Total:	22

Question	Answer	Mark
2(a)(i)	(plan drawing)	4
	1 large size + no shading ;	
	2 no cells + at least three lines or two lines and part of vascular tissue + correct section drawn ;	
	3 part of vascular tissue + epidermis drawn as two lines drawn closely together;	
	4 uses one label line + one label to phloem;	

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Question	Answer	Mark
2(a)(ii)	(layout of drawing)	5
	1 quality of line for outer wall of cells thin and sharp + minimum size at least 40 mm across largest cell;	
	2 only four cells drawn, each cell touching at least one other cell + no shading;	
	3 cell walls drawn as two lines close together;	
	4 at least one cell drawn with at least five sides ;	
	5 uses one label line + one label to cell wall;	
2(b)(i)	(simplest ratio)	4
	1 measures depth of the midrib + length of the vascular bundle;	
	2 records whole numbers (mm) or to 0.5 (mm) for both measurements;	
	3 displays, in final ratio, larger number to smaller number;	
	4 final answer as simplest ratio;	
2(b)(ii)	(conclusion)	1
	thick cuticle or air spaces or AVP;	

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Question	Answer	Mark
2(c)	(observable differences)	4
	organises comparison into three columns with one column for features, one headed M1 and one headed Fig. 2.2 ;	
	any three observable differences of comparison ; ; ;	
	Total:	18