Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/36**

Paper 3 Advanced Practical Skills 2 **October/November 2016**

MARK SCHEME

Maximum Mark: 40

Published

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Question	Answer	Mark
1(a)	*(risk assessment)* irritant + medium risk ;	**1**
1(b)(i)	*(decisions on serial dilutions)* 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 ;	**3**
1(b)(ii)	*(recording results)* 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 ;	**5**
1(b)(iii)	*(records time for **U**)* appropriate number for time + seconds ;	**1**
1(b)(iv)	*(interpretation of estimate)* correct estimate in accordance with recorded times ;	**1**

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Question	Answer	Mark
1(b)(v)	*(source of error with reason)* appropriate error with reason e.g. colour **+** difficult to judge **;**	**1**
1(b)(vi)	*(modification to investigate another variable)* 1 (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 **;**	**3**
1(c)(i)	*(layout of data)* 1 (*x*-axis) external concentration of glucose / mmol dm^{-3} **+** (*y*-axis) rate of glucose uptake by cells / mmol cm^{-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 **;**	**4**
1(c)(ii)	*(interpretation)* correctly reads value for rate of glucose uptake from graph at 7 mmol dm^{-3} **;**	**1**

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Question	Answer	Mark
1(c)(iii)	*(conclusion)* 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 **;**	**2**
	Total:	**22**

Question	Answer	Mark
2(a)(i)	*(plan drawing)* 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 **;**	**4**

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Question	Answer	Mark
2(a)(ii)	*(layout of drawing)* 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 **;**	**5**
2(b)(i)	*(simplest ratio)* 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 **;**	**4**
2(b)(ii)	*(conclusion)* thick cuticle or air spaces or AVP **;**	**1**

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Question	Answer	Mark
2(c)	*(observable differences)* 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 **; ; ;**	**4**
	Total:	**18**

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