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

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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**

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**

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**

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**

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**