

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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This document consists of **6** printed pages.

Page 2	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
1(a)	<i>(risk assessment)</i> irritant + medium risk ;	1
1(b)(i)	<i>(decisions on serial dilutions)</i> 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)	<i>(recording results)</i> 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)	<i>(records time for U)</i> appropriate number for time + seconds ;	1
1(b)(iv)	<i>(interpretation of estimate)</i> correct estimate in accordance with recorded times ;	1

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

Page 4	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
1(c)(iii)	<i>(conclusion)</i> 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)	<i>(plan drawing)</i> 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

Page 5	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
2(a)(ii)	<i>(layout of drawing)</i> 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)	<i>(simplest ratio)</i> 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)	<i>(conclusion)</i> thick cuticle or air spaces or AVP ;	1

Page 6	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
2(c)	<i>(observable differences)</i> 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