Cambridge International AS & A Level

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BIOLOGY **9700/32**

Paper 32 (Advanced Practical Skills 2) **May/June 2017**

MARK SCHEME

Maximum Mark: 40

Published

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Mark scheme abbreviations

;	separates marking points
/	alternative answers for the same point
R	reject
A	accept (for answers correctly cued by the question, or by extra guidance)
AW	alternative wording (where responses vary more than usual)
underline	actual word given must be used by candidate (grammatical variants accepted)
max	indicates the maximum number of marks that can be given
ora	or reverse argument
mp	marking point (with relevant number)
ecf	error carried forward
I	ignore

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Question	Answer	Marks
1(a)(i)	1 correct concentrations 0.03 (3×10^{-2}), 0.003 (3×10^{-3}), 0.0003 (3×10^{-4}), 0.00003 (3×10^{-5}) **+** % at least once **;** 2 shows transfer of 1 cm^3 of 0.3% from 2nd to 3rd beaker and transfer of 1 cm^3 of 0.03% from 3rd to 4th beaker and transfer of 1 cm^3 of 0.003% from 4th to 5th beaker **+** cm^3 **;** 3 adds 9 cm^3 of water to each beaker **;**	**3**
1(a)(ii)	1 table drawn **+** heading, percentage concentration of **S** **;** 2 heading, time **+** seconds **;** 3 records time for **W +** times for at least four concentrations of molecule **S** **;** 4 correct pattern of results, the time for the highest concentration of molecule **S** recorded as the longest time compared to the other concentrations of molecule **S** **;** 5 times recorded as whole seconds **;**	**5**
1(a)(iii)	1 reference to inhibition **;** 2 reference to substrate unable to bind to active site **;** 3 fewer, enzyme-substrate complexes / ESCs, formed **;**	**3**
1(a)(iv)	records time to reach end-point for solution **X** **;**	**1**
1(a)(v)	correct estimate according to results **;**	**1**
1(a)(vi)	appropriate error with reason, e.g. colour change of litmus paper **+** difficult to judge **;**	**1**
1(a)(vii)	1 increase number of concentrations (of **S**) or examples of concentrations **;** 2 between named concentrations (of **S**) or use simple / proportional dilution to make concentrations **;** 3 reference to drawing a graph and reading off estimate of the concentration of **S** in solution **X** or replication of new procedure **;**	**3**

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Question	Answer	Marks
1(b)(i)	1 (*x*-axis) organism **+** (*y*-axis) mercury concentration in tissue samples / ppm **;** 2 even width of bars **+** scale on *y*-axis: 10 to 2 cm, labelled at least each 2 cm **;** 3 correct plotting of five bars in the order of the table **;** 4 five bars drawn with thin lines **+** labelled as named organism in table **;**	**4**
1(b)(ii)	correct calculation of mean (19.1);	**1**
	Total:	**22**

Question	Answer	Marks
2(a)(i)	1 minimum size at least 90 mm **+** at least 3 vascular bundles drawn **;** 2 no cells **+** at least one enclosed area beneath epidermis with each end of enclosed area touching epidermis **+** only 3 vascular bundles drawn **;** 3 decides to subdivide vascular bundle into at least two areas **;** 4 epidermis drawn as two lines **;** 5 uses one label line **+** one label to xylem **;**	**5**
2(a)(ii)	1 quality of line for outer wall of cells (thin line) **+** minimum size at least 40 mm across largest cell **+** no shading **;** 2 only four cells drawn, each cell touching at least two other cells **;** 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)	1 organises comparison into three columns with one column for features, one column headed **M1** and one column headed **Fig. 2.1** **;** 2, 3, 4 any three observable differences of comparison **;;;**	**4**
2(b)(ii)	1 shows squares counted on **Fig. 2.2** **;** 2 uses correct units (cm^2) for area of xylem tissue and area of vascular bundle **;**	**2**
2(b)(iii)	1 shows value for area of xylem tissue divided by value for area of vascular bundle × 100 **;** 2 shows answer to appropriate degree of accuracy **;**	**2**
	Total:	**18**

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