Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/34**

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)(i)	*(conclusion)* least **;**	**1**
1(a)(ii)	*(decision)* cut length at least 50 mm / 5 cm **;**	**1**
1(a)(iii)	*(decision)* repeat (with same piece or replicate with both pieces of plant tissue) **;**	**1**
1(a)(iv)	*(recording results)* 1 table drawn **+** heading, solutions **;** 2 heading, angle of bend + correct units **;** 3 readings recorded for all three samples of potato + repeats **;** 4 correct pattern of results **;** 5 records as whole numbers or to half a degree **; ;**	**5**
1(a)(v)	*(interpretation of results)* correct identification of **S1**, **S2** and **S3** according to results **;**	**1**
1(a)(vi)	*(collects angle of bend for **S4**)* records as a whole number or to half a degree **;**	**1**

Question	Answer	Mark
1(a)(vii)	*(interpretation of result)* correct estimate according to results from **(iv)** and **(v)** **;**	**1**
1(a)(viii)	*(layout of data)* 1 (*x*-axis) concentration of sodium chloride / mol dm^{-3} **+** (*y*-axis) angle of bend / degree(s) or ° **;** 2 (scale on *x*-axis) 0.2 to 2 cm, labelled at least each 2 cm **+** (scale on *y*-axis) reasonable scale with results, labelled at least each 2 cm **;** 3 five plots either joined point to point or as a line of best fit, drawn as a thin line **;**	**3**
1(a)(ix)	*(collects and interprets angle of bend)* 1 shows on graph at **S4** angle of bend using at least one line to *x*-axis or a plotted point **;** 2 records correct concentration from graph **+** units **;**	**2**
1(b)	*(improvements to procedure)* *three from* 1 increased number of concentrations **;** 2 use proportional or simple or serial dilution **;** 3 repeat or replicate **;** 4 AVP **;**	**3**

Question	Answer	Mark
1(c)	*(conclusions)* 1 water has higher water potential than cells / tissue / **ora ;** 2 water moves into cells by osmosis **;**	**2**
	Total:	**21**

Question	Answer	Mark
2(a)(i)	*(plan drawing)* 1 large size **+** no shading **;** 2 no cells **+** correct section drawn **+** appropriate detail **;** 3 correct proportions **;** 4 vascular tissue divided into at least three layers **;** 5 outermost layer drawn as two lines (on both surfaces of leaf) **;** 6 label line and label to epidermis **;**	**6**

Question	Answer	Mark
2(a)(ii)	*(high power 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 of the other cells **;** 3 cell walls drawn as two lines close together **;** 4 at least one cell drawn with at least five sides **;** 5 width of one cell smaller than another cell **or** an inclusion present in at least one cell **;** 6 uses one label line **+** one label to cell wall **;**	**6**
2(b)(i)	*(collects and shows display of working)* 1 correct measurements for all five lines **+** as whole numbers or to 0.5 only **+** units as mm **;** 2 shows division by 75 **;**	**2**
2(b)(ii)	*(shows display of working and interpretation)* 1 shows addition of measurements from **(b)(i) +** division by 5 **;** 2 correct answer to appropriate degree of accuracy **+** units μm **;**	**2**

Question	Answer	Mark
2(c)	*(observable differences)* organises comparison into three columns with one column for features, one headed **L1** and one headed Fig. 2.2 **;** any three observable differences of comparison **; ;**	**3**
	Total:	**19**