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**BIOLOGY**

**9700/34**

Paper 3 Advanced Practical Skills 2

**October/November 2017**

MARK SCHEME

Maximum Mark: 40

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**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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**Mark scheme abbreviations**

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

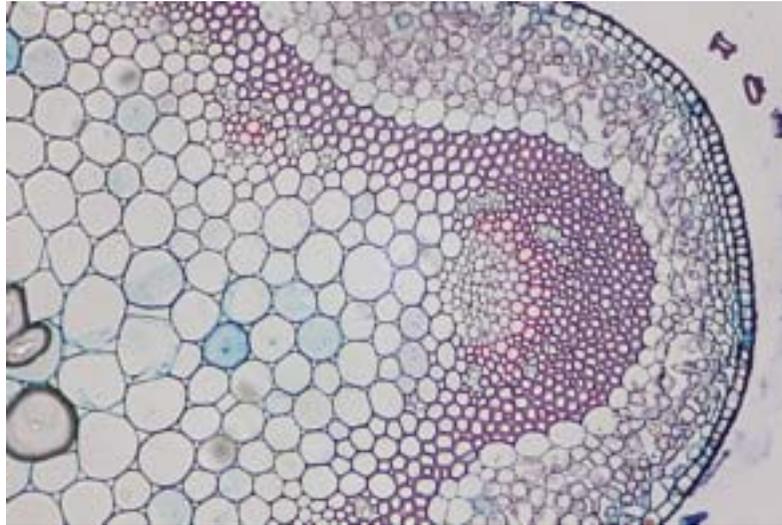
Question	Answer	Marks
1(a)(i)	every 1 minute or evenly spaced times ;	<b>1</b>
1(a)(ii)	suitable volume between 10 and 50 ;	<b>1</b>
1(a)(iii)	1 heading for independent variable (column to left of recorded data or top row) time + correct units ; 2 heading for dependent variable colour or observation ; 3 colours for all samples ; 4 colours clearly described e.g. blue, blue green, green, yellow green, yellow ; 5 0 recorded as blue ; 6 two columns to show comparison between first 10 minutes and second 10 minutes ;	<b>6</b>
1(a)(iv)	correct reference to time and colour for both trials ; (compare) first 10 minutes with second 10 minutes, e.g. slower or faster or same ;	<b>2</b>

Question	Answer	Marks
1(b)(i)	five or more concentrations ; made by simple dilution or serial dilution or described or named examples ;	<b>2</b>
1(b)(ii)	compare unknown concentration time with known concentration times  <b>or</b> draw a graph and read off ; <b>R</b> colours	<b>1</b>
1(c)(i)	x-axis <u>type of sugar</u> + y-axis <u>rate of metabolic reactions / au</u> ; scale on x-axis: even width of bars + scale on y-axis is 0.1au to 2 cm + labelled each 2 cm ; correct plotting of bars in the order of the table ; bars drawn with thin sharp ruled line vertical lines meeting horizontal lines + labelled ;	<b>4</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(c)(ii)	1 quicker in glucose than sucrose ; 2 sucrose is a disaccharide and glucose is a monosaccharide ; 3 sucrose needs breaking down (glucose does not) ; 4 (into) glucose and fructose ; 5 (metabolic reactions with) sucrose do not release as much CO <sub>2</sub> ; 6 glucose can fit into the enzymes active site (sucrose / fructose cannot) <b>or</b> more enzyme substrate complexes ; 7 more enzymes for metabolising glucose ;	<b>4</b>

Question	Answer	Marks
2(a)(i)	1 minimum size + no shading + no cells ; 2 drawn correct (bulge / curved) area ; 3 draws tissues in vascular bundle correctly in the correct position ; 4 draws bulge and correct shape of tissues ; 5 label line and label to pith ;	<b>5</b>
2(a)(ii)	1 size at least 40 mm across the largest cell at the widest point + quality of lines are continuous, thin and sharp ; 2 draws only four cells + each cell touching at least two of the other cells ; 3 two lines drawn around each cell + three lines where cells touch ; 4 (epidermal cell) at least one cell with a convex surface ; 5 identifies and draws correct cells, e.g. different shapes and sizes ; 6 label line and label to cell wall ;	<b>6</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(b)(i)	1 correct measurements of root and vascular tissue using line <b>P–Q</b> ; 2 both measurements using same units ; 3 larger number to smaller number ; 4 to lowest common denominator ;	<b>4</b>
2(b)(ii)	collects <b>only</b> observable differences ; three correct differences ;;;	<b>4</b>

Question	Answer	Marks
	 <p data-bbox="362 772 591 804">TS Plantain stem</p> 