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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2016	9700	31

Question	Answer	Mark
1(a)(i)	<p><i>(decisions on serial dilutions)</i></p> <ol style="list-style-type: none"> correct concentrations of 0.5, 0.25, 0.125, 0.0625 + % ; shows transfer of 10 cm³ of 1% to next dilution + 10 cm³ transferred from 2nd to 3rd beaker and from 3rd to 4th and from 4th to 5th + cm³ ; adds 10 cm³ of water to each beaker ; 	3
1(a)(ii)	<p><i>(decision)</i></p> <p>volume of Benedict's solution equal to or greater than 2 cm³ of reducing sugar ;</p>	1
1(a)(iii)	<p><i>(recording results)</i></p> <ol style="list-style-type: none"> table drawn + heading, percentage concentration of reducing sugar ; heading, time + seconds ; times recorded as whole seconds ; 	3
1(a)(iv)	<p><i>(calculation)</i></p> <ol style="list-style-type: none"> shows 1 divided by 42 ; correct answer as 0.024 ; 	2

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Question	Answer	Mark
1(a)(v)	<p><i>(decisions)</i></p> <p>two from</p> <ol style="list-style-type: none"> 1 states volume of Benedict's solution ; 2 states volume of M1 + M2 ; 3 states temperature of water-bath ; 	2
1(a)(vi)	<p><i>(recording results)</i></p> <p>records time in seconds for M1 + M2 ;</p>	1
1(a)(vii)	<p><i>(interpretation)</i></p> <ol style="list-style-type: none"> 1 states percentage concentration of reducing sugar for M1 (either known concentration or between known concentrations) ; 2 states percentage concentration of reducing sugar for M2 (either known concentration or between known concentrations) ; 	2
1(a)(viii)	<p><i>(conclusion)</i></p> <p>M2 + no or very little reducing sugar ;</p>	1

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Question	Answer	Mark
1(b)(i)	<p><i>(layout of data)</i></p> <ol style="list-style-type: none"> 1 (x-axis) time after drinking milk containing lactose / minutes + (y-axis) concentration of hydrogen in exhaled air / ppm ; 2 (scale on x-axis) 20 to 2 cm, labelled at least each 2 cm + (scale on y-axis) 20 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 either joined point to point or as a smooth curve, drawn as a thin line ; 	4
1(b)(ii)	<p><i>(plan drawing)</i></p> <ol style="list-style-type: none"> 1 large size + no shading ; 2 no cells + correct section drawn + appropriate detail of inner section ; 3 outermost layer drawn as two lines ; 4 draws gap between outer and inner layer ; 	4
	Total:	23

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Question	Answer	Mark
2(a)(i)	<p><i>(layout of drawing)</i></p> <ol style="list-style-type: none"> 1 quality of line for outer wall of cells thin and sharp + minimum size at least 40 mm across largest cell ; 2 only three cells drawn + each cell touching at least one of the other cells ; 3 draws contents in at least one cell ; 4 uses one label line + one label to cell wall ; 	4
2(a)(ii)	<p><i>(conclusion)</i></p> <p><i>(function)</i> photosynthesis ;</p> <p><i>(feature)</i> chloroplasts ;</p>	2
2(b)	<p><i>(observable differences)</i></p> <p>organises comparison into three columns with one column for features, one headed J1 and one headed Fig. 2.1 ;</p> <p>any three observable differences of comparison ; ; ;</p>	4
2(c)(i)	<p><i>(diameter of field of view)</i></p> <p>records measurement within range ;</p>	1
2(c)(ii)	<p><i>(fraction of the diameter of the field of view)</i></p> <p>estimates within range ;</p>	1

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Question	Answer	Mark
2(c)(iii)	<p><i>(depth of midrib)</i></p> <p>1 shows answer to (c)(i) multiplied by answer to (c)(ii) ;</p> <p>2 decision to multiply by 1000 (to convert to μm) ;</p>	2
2(c)(iv)	<p><i>(improvements)</i></p> <p>1 reference to eyepiece graticule + stage micrometer ;</p> <p>2 measurement of midrib using eyepiece graticule ;</p> <p>3 reference to calibration of eyepiece graticule ;</p>	3
	Total:	17