

## **Cambridge International Examinations**

Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY 9700/31

Paper 3 Advanced Practical Skills 1

May/June 2016

MARK SCHEME
Maximum Mark: 40

## **Published**

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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:

; 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)

<u>underline</u> 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

<u> </u>	l .	Cambridge international AGIA Ester inay/Cario 2010		
1	(a) (i)	(decides level of water) two levels of water drawn + labelled 'before' + 'after'; bottom level drawn still above/covering the level of reducing sugar Visking tubing;	[2]	
	(ii)	(decisions on completion of table) correct volumes of <b>G</b> for four further dilutions; correct total volumes of 10 for each concentration;	[2]	
	(iii)	<ol> <li>(recording results)</li> <li>heading (top left of data), %/percentage concentration of reducing sugar solution;</li> <li>heading (any column/row), time + seconds;</li> <li>collects readings of reducing sugar solutions as whole seconds;</li> <li>concentration at top + other concentrations in decreasing order;</li> </ol>	[4]	
	(iv)	(decision about variable to standardise) volume/3 cm³, of Benedict's (solution) or volume/2 cm³, of U/sample or temperature (of water-bath);	[1]	
	(v)	(interprets results) time recorded in whole seconds + correct units;	[1]	
	(vi)	estimate for <b>U</b> matches results in (a)(iii);	[1]	
	(b) (i)	<ol> <li>(line graph)</li> <li>(x-axis) percentage concentration of sucrose solution + (y-axis) time (to) decolourise potassium manganate(VII) solution/s;</li> <li>(scale on x-axis) 0.5 to 2 cm + labelled at least every 2 cm + (scale on y-axis) 40.0 to 2 cm, labelled at least each 2 cm;</li> <li>correct plotting of five points with a small cross or dot in circle;</li> <li>five plots + thin line drawn;</li> </ol>	[4]	
	(ii)	(interpretation) correctly reads from graph time to decolourise at 1.75%; correctly reads from graph time to decolourise + units;	[2]	
	(iii)	(conclusion) more substrate/higher enzyme activity; more active sites occupied/bind/join or more enzyme-substrate complexes/ESCs;	[2]	
	(iv)	<ul> <li>(modifications)</li> <li>1. (standardise sucrose concentration) using same (sucrose) concentration or name sucrose concentration;</li> </ul>	(standardise sucrose concentration) using same (sucrose) concentration or named	
		<ol> <li>(independent variable pH) at least five pH or five examples;</li> <li>(method) use of <u>buffers</u> (to make pH at regular intervals);</li> </ol>	[3]	
		[Total:	22]	

**Mark Scheme** 

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Syllabus

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Р	age 4	4	Mark Scheme	Syllabus	Paper
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2	(a)	(i)	<ul> <li>(plan diagram)</li> <li>1. plan diagram of appropriate size + no shading;</li> <li>2. no cells + correct section drawn;</li> <li>3. endodermis shown by two lines in the correct proportions;</li> <li>4. uses one label line + one label to xylem;</li> </ul>		[4]
		(ii)	<ol> <li>(drawing)</li> <li>quality of line for outer wall of cells + size at least 40 mm across cell;</li> <li>only four cells drawn, each cell touching at least one other cell;</li> <li>cell walls drawn as two lines close together;</li> <li>cells drawn with correct proportion of length to width;</li> <li>uses one label line + one label to cell wall;</li> </ol>	_	[5]
(b)	(b)	(i)	(calculation) collects correct measurements of lines K, L, M, N, O + correct units each measurement; shows division by the magnification (25);	for	[2]
		(ii)	(displays and division) shows addition of 5 measurements + shows division by 5; correct answer + correct units;		[2]
		(iii)	(conclusion) aquatic + air cavities for buoyancy or support or providing/storing or	oxygen;	[1]
	(c)	org	pservable difference between root on <b>J1</b> and stem in <b>Fig. 2.2</b> ) ganises comparison into three columns with one column for features, the headed <b>J1</b> and one headed <b>Fig. 2.2</b> ; Three observable differences of comparison;  e.g. <b>J1</b> has smaller air cavities than <b>Fig 2.2</b>		[4]

2

[Total: 18]