

## **Cambridge Assessment International Education**

Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY 9700/31

Paper 3 Advanced Practical Skills 1

October/November 2017

MARK SCHEME
Maximum Mark: 40

**Published** 

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## Mark scheme abbreviations

; separates marking points

I 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

l ignore

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Question	Answer	Marks
1(a)(i)	lose + less ;	1
1(a)(ii)	completes Fig. 1.3 drawing all three directions correctly (up + level + down);	1
1(b)(i)	for at least 4 suitable concentrations of <b>S</b> ; e.g. 0.8, 0.6, 0.4 and 0.2	3
	decides correct volume of sucrose volumes for selected concentrations;	
	decides correct total volumes (40 cm <sup>3</sup> ) for each concentration;	
1(b)(ii)	decides appropriate length of potato pieces ; e.g. 4.0 cm	
1(b)(iii)	1 table drawn + heading, concentration of sucrose solution/mol dm <sup>-3</sup> ;	6
	2 heading, direction of movement;	
	3 records speed of movement in an appropriate way ;	
	4 decides to do repeated drops;	
	5 results for at least 4 concentrations of sucrose;	
	6 correct sequence of directions;	

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Question	Answer	Marks
1(b)(iv)	correct estimate of concentration of sucrose according to results in (b)(iii);	1
1(b)(v)	identifies one significant source of error; e.g. difficulty of measuring and cutting pieces of potato to correct dimensions	1
1(b)(vi)	uses increased number of concentrations of sucrose solution;	3
	between 2 stated concentrations appropriate to candidate's results;	
	read off from graph of results or replicate;	
1(b)(vii)	no net movement of water or reference to dynamic equilibrium;	1
1(b)(viii)	shows on graph reading at 0.3 mol dm <sup>-3</sup> to estimate the water potential;	2
	correct estimate for water potential + kPa × 10 <sup>2</sup> ;	

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Question	Answer	Marks
2(a)(i)	1 quality of line (thin and continuous) for at least 6 grains drawn;	5
	2 draws only 3 starch grains from <b>F</b> + only 3 starch grains from <b>G</b> ;	
	3 grains not overlapping;	
	4 starch grains from <b>F</b> drawn as oval shapes <b>+</b> starch grains from <b>G</b> drawn as angular shapes ;	
	5 uses one label line + one label, X, to identify surface markings on grains;	
2(a)(ii)	correct annotations describing observable differences between the starch grains from <b>F</b> and <b>G</b> ;;; e.g. size of grains from <b>F</b> larger than grains from <b>G</b>	3
2(b)(i)	1 (x-axis) time/minutes + (y-axis) reducing sugar concentration/µM;	4
	2 (scale on x-axis) 10.0 to 2 cm, labelled at least each 2 cm + (scale on y-axis) 2.0 to 2 cm, labelled at least each 2 cm;	
	3 correct plotting of six points with a small cross or dot in circle;	
	4 six plots, joined plot to plot + thin line drawn;	
2(b)(ii)	1 states correct reducing sugar concentration at 35 minutes (x) and 15 minutes (y);	3
	2 shows <b>x</b> minus <b>y</b> ;	
	3 shows answer to mp2 divided by <b>y</b> and multiplied by 100;	

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Question		Answer	Marks
2(c)	1	plan diagram of appropriate size + no cells + no shading;	5
	2	correct section drawn + draws only 3 vascular bundles;	
	3	draws epidermis as 2 lines ;	
	4	draws at least one vascular bundle divided into at least 3 sections;	
	5	uses one label line + one label to identify phloem;	

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