SECTION B

Question			Answer	Marks	Guidance
21	(a)	(i)		max 2	*Mark first* **two** *answers only, ignoring the numbered sections* **IGNORE** mass / balance used / soak time / repeats **IGNORE** a list of variables unqualified
			1 discs same **,** size / thickness / surface area / surface area to volume ratio / diameter ✓		1 **ACCEPT** same cork borer used **ACCEPT** 'pieces of potato' etc. for 'discs' **ACCEPT** 'length' as equivalent to 'diameter' **IGNORE** same shape / similar size etc
			2 same (variety / part **,** of) potato ✓		
			3 no skin on potato ✓		
			4 *ref to* removing excess water before (re)weighing ✓		4 e.g. blotting / shaking
			5 same **,** number / amount **,** of discs (in each solution) ✓		
			6 same <u>volume</u> (sucrose) <u>solution</u> ✓		
			7 same temperature ✓		7 **ACCEPT** in context of room / environment / solution
			8 cover the tubes ✓		

Question			Answer	Marks	Guidance
21	(a)	(ii)	1 *idea that* no change of mass occurs when the water potential of (sucrose) <u>solution</u> = water potential of potato (tissue) ✓ 2 ref. to no change in mass (of potato) between 0.2 and 0.3 mol dm^{-3} ✓ 3 plot graph of concentration of **,** sucrose / solution **,** against (%) change in mass **and** find which (sucrose) concentration gives no change in mass of potato **OR** carry out the experiment again with more (sucrose) concentration intervals between 0.2 and 0.3 mol dm^{-3} ✓ 4 look up the water potential of the (sucrose) <u>solution</u> (e.g. on calibration curve or table) **,** of that concentration / of the concentration which gives no mass change ✓	max 3	**ACCEPT** Ψ for water potential throughout **IGNORE** ref to solute potential / isontonic 2 correct units must be stated once **ACCEPT** 'between 0.2 and 0.3 mol dm^{-3} the water potential of the solution and the potato will be the same' 3 x and y axes interchangeable When an axis has been identified it can be referred to by letter later. Needs some ref to the mass change being 0. If the change in mass axis has previously been identified, then ref to that axis value being 0 is equivalent to no change in mass e.g. '*Should draw a graph of sucrose concentration on the x axis and change in mass of potato discs on the y axis. The point where the line of best fit crosses the x axis (when the y axis = 0) is the concentration of sucrose in the potato discs.*' will get the mark '*Draw a graph with change in mass of potato discs on the y axis and concentration of sucrose solution on the x axis and draw a line of best fit. Where the line intercepts the x axis is where the change in mass of potato discs is zero.*' will get the mark 3 correct units must be stated once

Question			Answer	Marks	Guidance
21	(b)	(i)	X (cellulose) cell wall ✓ Y cell <u>surface</u> membrane / plasma membrane ✓ Z <u>vacuole</u> <u>membrane</u> / tonoplast ✓	max 3	*If additional incorrect answer given, then 0 marks* Y **ACCEPT** plasmalemma Z **IGNORE** vacuole
21	(b)	(ii)	sucrose <u>solution</u> ✓	1	*If additional incorrect answer given, then 0 marks* **ACCEPT** sugar solution / external solution / solution placed in **DO NOT CREDIT** 'solution' unqualified

21	(c)		there is a lo<u>wer</u> <u>water</u> <u>potential</u> inside
			                       root <u>hair</u> (cells) ✓
			
			 actively transport / pump ,
			     (mineral) ions / salts , into root <u>hair</u>(s) (cells)
			 or
			 root <u>hair</u>(s) (cells) store / contain ,
			               (mineral) ions / salts / solutes ✓
				2	**IGNORE** ref to large surface area and short diffusion path
					 IGNORE ref to solute potential / isotonic
					 ACCEPT Ψ for water potential
					 'it' or 'they' = root hairs
					 IGNORE ref to roots or root cells unqualified as hairs
					
					 ACCEPT root hair , has / creates ,
					                 a lo<u>wer</u> <u>water</u> <u>potential</u> (than soil)
					 ACCEPT maintains / sets up / establishes ,
					                 a (steep) <u>water</u> <u>potential</u> gradient
					 Look for a comparison in water potential between the cell and the soil
					
					 IGNORE solutes / sugars / hydrogen ions
					 ACCEPT named ions
					
					 ACCEPT named ions
					 ACCEPT named solutes e.g. sugars

			Total	11	