Answers to examination-style questions

Answers	Marks	Examiner's tips
1 (a) diffusion/movement of water; through a partially-permeable membrane; from less negative to more negative/from higher water potential to lower water potential;	**3**	If you find water potential difficult, try drawing a numbered line starting at 0 and going down with negative numbers. Pure water has a water potential of 0. All **solutions** have a negative water potential.
(b) (i) 5.55 cm (*allow 5.5 or 5.6 only if supported by correct working*); 5/0.9 = 5.55;	**2**	Correct answer = 2 marks. Correct working but incorrect answer = 1 mark. Always show which numbers you are using for a calculation. You will be credited for the correct working even if you make a mistake working out the final answer.
(ii) 1. T anywhere to left of 0.3 M; 2. W at 0.3 M;	**1**	
2 (a) (i) microvilli (*reject brush border*);	**1**	
(ii) increased surface area (for diffusion);	**1**	
(b) (i) 90 000 9 × 1000/0.1 = 90 000;	**2**	Correct answer = 2 marks. Correct working but incorrect answer = 1 mark. Use the scale bar. Measure the length using a ruler. Length of bar = 9 mm, convert to micrometres by multiplying by 1000 then divide by stated length of scale bar.
(ii) electron microscope has a greater resolving power/objects closer together can be distinguished; electron (beams) have a shorter wavelength;	**2**	
(c) short diffusion pathway/short pathway to the centre/large surface area to volume ratio for faster/more diffusion;	**1**	
3 (a) passive/do not require energy/ATP; movement down a concentration gradient/by diffusion; go through phospholipid (bilayer)/not by protein/carriers;	**2**	Make sure your answers are correct for oxygen **and** water. If a word is in bold print, read it very carefully! It is like that for a reason!
(b) active transport; occurs when oxygen present because energy/respiration required *OR* against a concentration gradient because there is no uptake in curve Z;	**2**	As soon as you see oxygen or respiration involved with transport, you should be thinking about active transport as this is the only process that uses energy.

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(c) concentration inside cells higher than surrounding solution;	**1**	
(d) diffusion is proportional to the concentration gradient;	**1**	
4 (a) *two* of the following: selectively permeable; allows cell to maintain different concentrations either side; gives flexibility/fluidity;	**2**	Make sure that you only give two answers rather than a long list – note **two** in bold! The examiner will not choose the correct answers from your list. You must decide which you want to give. You will not be given extra marks and it wastes time.
(b) (surface/extrinsic protein) for cell recognition/binding to hormones/ identification;	**1**	
(c) (i) involves carrier/transmembrane/ transport proteins (*reject channel proteins*);	**1**	
(ii) requires energy/requires use of ATP/ moves substances against a concentration gradient;	**1**	
(iii) the curve levels off above a certain external concentration of substance; as channel proteins are saturated with molecules (and no more can be carried);	**2**	Always tell the full story of the graph. If the gradient (steepness) of the curve changes, comment on the changes and identify the turning point using numbers.
5 (a) (i) cold – no/reduced enzyme action/ e.g. stops autolysis (*reject 'cell activity reduced'*);	**1**	
(ii) isotonic – stops osmotic effects/ description of effect on cells or organelles;	**1**	
(iii) buffer – prevents damage to enzymes/ proteins;	**1**	
(b) break open the cells/release the cell contents;	**1**	
(c) supernatant/liquid above the pellet; spun at a high**(er)** speed;	**2**	Remember the supernatant is the liquid and the pellet is the solid in the bottom of the tube after centrifuging.