IGCSE BIOLOGY 0610 – MARK SCHEME

Exam-style Practice Paper: Diffusion and Osmosis

Maximum mark: **34**

How to use this mark scheme

- **;** separates marking points: award 1 mark for each point.
- **/** separates alternative answers for the same marking point.
- **allow** = accept this answer. **do not allow** = do not give a mark for this answer.
- ( ) words in brackets are not needed for the mark. Underlined words must be present.
- **ecf** = error carried forward: give the mark if a wrong earlier answer is used correctly.
- Award full marks for a correct final answer with no working, unless the question says “show your working”.

Question	Answer	Marks	Guidance
1(a)	(net) movement of particles / molecules from a region of higher concentration to a region of lower concentration / down a concentration gradient ; as a result of their random movement ;	2	allow: ions for particles do not allow: 'movement of particles' with no direction for M1
1(b)	into the cell ; (because) there is a higher concentration of oxygen outside the cell than inside / oxygen moves down its concentration gradient ;	2	M2 needs a comparison of concentrations
1(c)	any two from: larger surface area ; higher temperature ; steeper / larger concentration gradient ; shorter distance (for diffusion) ;	2	allow: thinner membrane / thinner surface for shorter distance
1(d)	kinetic energy of the (random) movement of molecules / particles	1	do not allow: energy from respiration / ATP
1(e)	particles have more kinetic energy / move faster ; so more particles move down the concentration gradient per unit time / rate increases ;	2	
2(a)	0.4: (2.45 – 2.50) ÷ 2.50 × 100 = –2.0 ; 0.6: (2.30 – 2.50) ÷ 2.50 × 100 = –8.0 ;	2	negative sign needed for each mark allow –2 and –8
2(b)	all five points plotted correctly (to within half a small square) ;; smooth curve or ruled line of best fit ;	3	4 points correct = 1 mark for plotting ecf from 2(a) do not allow: dot-to-dot lines for the best-fit mark
2(c)	value read from where the candidate's line crosses 0%	1	expected value about 0.34 allow 0.30–0.38 mol per dm^3

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Question	Answer	Marks	Guidance
2(d)	water moved into the (potato) cells by osmosis ; from a higher water potential (distilled water) to a lower water potential (inside the cells) ; through a partially permeable (cell) membrane ;	3	allow: dilute solution to concentrated solution for M2 do not allow: water moves from high concentration to low concentration (unqualified)
2(e)	the cylinders might have had different starting masses / allows a fair comparison between cylinders	1	allow: makes results comparable
2(f)	any two from: temperature ; time in solution ; size / surface area of cylinder ; type / age of potato ; volume of solution ;	2	do not allow: amount of potato (too vague) unless qualified as mass / size
3(a)(i)	plasmolysed	1	allow: plasmolysis do not allow: flaccid
3(a)(ii)	any three from: the salt solution has a lower water potential than the cell ; water leaves the cell by osmosis ; the vacuole / cytoplasm shrinks ; the cell membrane pulls away from the cell wall ;	3	allow: solution more concentrated than cell sap
3(b)	any three from: water enters both cells by osmosis ; a red blood cell / animal cell has no cell wall ; so the membrane stretches and bursts ; the plant cell wall is strong / inelastic / resists expansion ; turgor pressure builds up / the plant cell becomes turgid ;	3	
3(c)	any two from: supports the plant / keeps stems and leaves upright ; holds leaves out to absorb light ; without it the plant wilts ;	2	allow: helps open stomata (guard cells)
4	row 1: active transport only ; row 2: osmosis only ; row 3: active transport only ; row 4: diffusion and osmosis ;	4	1 mark for each fully correct row
	Total	**34**	

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