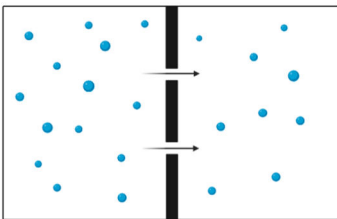


**BIOLOGY**  
Mark Scheme

**LM12 - OSMOSIS & WATER POTENTIAL**

**Q1)**

- a) Osmosis is the net movement of water molecules from a high concentration of water molecules to a region of low concentration of water **(1)**
- b) A passive process is a process that does not require metabolic energy/ cellular energy **(1)**
- c) Arrow facing right **(1)**

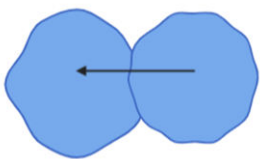


**Q2)**

- a) Water potential is the potential energy of water **(1)** per unit volume relative to pure water **(1)**
- b) A—True **(1)** B—False **(1)** C—False **(1)** D—True **(1)**
- c) Solute potential is the amount of solutes dissolved in water **(1)**

**Q3)**

- a) Arrow facing left **(1)**



- b) Cell 1 has a water potential of  $-61\text{kPa}$  while cell 2 has a water potential of  $-59\text{kPa}$  **(1)** Due to cell 2 having a higher water potential, the net movement of water molecules will be to cell 1 **(1)**
- c)  $\Psi = \Psi_s + \Psi_p$  **(1)**

**Q4)**

- a) A hypertonic solution **(1)** as it has a lower water potential than the cell it is surrounding **(1)** This means the net movement of water molecules will be out of the cell **(1)** This may cause the cell to shrink (undergo plasmolysis) **(1)**
- b) There is no net movement of water molecules **(1)** as the water potential of the isotonic solution is equal to the water potential of the cell **(1)**
- c) **A**— Salts normally cause a solution to have a lower water potential **(1)**