



QUESTION WORKBOOK

Diffusion and osmosis: movement that costs nothing

Membranes and transport across cells · Unit B04

AQA 3.2.3 · OCR A 2.1.5 (d)–(f) · Edexcel A Topic 4.6 · CAIE 4.2

6 questions · 20 marks

PRINT EDITION

SECTION A · Short, 1 to 2 marks

- A1** State the water potential of pure water at atmospheric pressure, and state what this tells you about the sign of the water potential of any solution. [2]

SECTION B · Standard, 3 to 5 marks

- B1** A potato cylinder of initial mass 4.20 g is left in a sucrose solution for thirty minutes, blotted dry and reweighed at 3.78 g. Calculate the percentage change in mass and state the direction of net water movement. [4]

- B2** Explain what happens to a red blood cell placed in distilled water, and what happens to an identical red blood cell placed in a concentrated sodium chloride solution. [4]

- B3** The uptake of glucose by red blood cells rises as the external glucose concentration rises and then levels off, while the uptake of oxygen by the same cells continues to rise across the whole range tested. Suggest an explanation for both results. [4]

- B4** A plant cell has a water potential of -1150 kPa and a pressure potential of $+450$ kPa. Calculate the solute potential of the cell, giving your answer in kPa. [3]

- B5** Explain how the alveoli of the lungs and the blood flowing past them maintain a high rate of diffusion of oxygen into the blood. [3]
