Qno: 11. In an oxygen-nitrogen gas mixture at 1 atm. 25^0C, the concentrations of oxygen at two planes 0.2 cm apart are 10% and 20% (by volume) respectively. Calculate the flux of oxygen when.

(i) Nitrogen is non-diffusing and.
(ii) There is equimolal counter diffusion.

Diffusivity of oxygen in nitrogen is 0.215 cm^2/s.

Qno12: Ammonia is diffusing through an inert air film 2 mm thick at a temperature of 20^0c and a pressure of 1 atm. The concentration of ammonia is 10% by volume on one side of the film and zero on the other side. Determine the mass flux. Estimate the effect on the rate of diffusion if the pressure is increased to 10 atm. The diffusivity of NH_3 in air at 20^0c and 1 atm. Is 0.185 cm^2/s.

Qno 13:calculate the rate of diffusion of acetic acid (A) across a film of non-diffusing water (B) solution 2 mm thick at 17^0c,when the concentration on the opposite sides of the film are 9% and 3% acid (by weight). The diffusivity of acetic acid in the solution is 0.95×10^{-9} m^2/s. Density of 9% and 3% by weight acid are 1012 kg/m^3 and 1003 kg/m^3 respectively.

Z= 2 mm T = 290^0c, $D_{AB} = 0.95 \times 10^{-9}$ m^2/s.

Qno14; Benzene is stored in a tank of diameter 10 m and open at the top. A stagnant air film 10 mm thick is covering the surface liquid beyond which benzene is absent. If the atmospheric temperature is 25^0C and the corresponding vapor pressure is 150 mm Hg, estimate the rate of loss of benzene. Diffusivity of benzene is 0.02 m^2/hr. Total pressure is 1.0 atm.

Qno 15: Ammonia is diffusing through an inert air film 2 mm thick at the temperature of 20^0C and a pressure of 1 atm. The concentration of ammonia is 10% by volume on one side of the film and zero on the other side.D_{AB} at 0^0c and 1 atm. 0.198 cm^2/s. estimate rate of diffusion if the temperature is 20^0C and pressure is raised to 5 atm.