

Daily Tutorial Sheet-1

Level-1

1.(B) $C_1 \alpha_1^2 = C_2 \alpha_2^2$

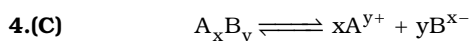
$$0.1 \times 10^{-4} = 2.5 \times 10^{-2} \times \alpha_2^2$$

$$4 \times 10^{-4} = \alpha_2^2 \Rightarrow \alpha_2 = 2 \times 10^{-2} \Rightarrow \% \text{ ionization} = 2 \%$$

2.(A) Acid is H^+ donor.

3.(A) $[H^+] = \sqrt{K_a C} \Rightarrow K_{a1} C_1 = K_{a2} C_2$

$$1.8 \times 10^{-4} \times 10^{-3} = 1.8 \times 10^{-5} \times C_2 \Rightarrow C_2 = 10^{-2}$$



$$t = 0 \quad C \quad 0 \quad 0$$

$$t = t_{eq} \quad C(1 - \alpha) \quad xC\alpha \quad yC\alpha$$

$$K_{eq} = \frac{(xC\alpha)^x (yC\alpha)^y}{C(1 - \alpha)} \quad \text{where } 1 - \alpha \approx 1 \Rightarrow \alpha = \left(\frac{K_{eq}}{C^{x+y-1} x^x y^y} \right)^{\frac{1}{x+y}}$$

5.(A) Due to common ion effect dissociation of weak electrolyte is suppressed

6.(B) Weaker electrolytes ionize feebly 7.(B) Lower the value of K_b ; weaker is the base

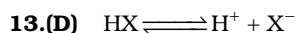
8.(A) $[H^+] = 10^{-5} = \sqrt{K_a C} \Rightarrow K_a = 10^{-10}$ 9.(D) pH is nearest to 7 (will be slightly more than 7)

10.(B) On increasing temperature ionisation of water increases

$\Rightarrow [H^+]$ increases and hence pH decreases

11.(A) The solution is slightly basic because concentration of NaOH is too low. The concentration of OH^- is contributed not only from NaOH but also from water.

12.(C) $pH = 14 - pOH = 14 + \log [OH^-] = 14 + \log \frac{50 \times 10^{-3} \times 2}{100} = 11$



If, $HX \rightarrow$ acid

then, $X^- \rightarrow$ conjugate base

14.(B) $pH = -\log [H^+] = -\log (0.005 \times 2) = 2$

15.(C) $pH = \frac{1}{2} (pK_a - \log C)$

$$2 = \frac{1}{2} (pK_a + 1) \Rightarrow K_a = 10^{-3} \Rightarrow \alpha = \sqrt{\frac{K_a}{C}} = 0.1$$