

Q The pH of 0.02 M NH_4Cl soln [Given
 $K_b(\text{NH}_4\text{OH}) = 10^{-5}$ $\log 2 = 0.301$] [2019 JEE Main]

Soln $K_b(\text{NH}_4\text{OH}) = 10^{-5}$ $\text{p}K_b = -\log K_b = -\log(10^{-5})$
 $= 5$
 $C = \text{Conc. of salt} = 0.02 \text{ M}$ (Salt hydrolysis)

$$\text{pH} = 7 - \frac{1}{2} (\log K_b + \log C) =$$

$$= 7 - \frac{1}{2} [5 + \log(2 \times 10^{-2})]$$

$$= 7 - \frac{1}{2} [5 + \log 2 - 2] = 7 - 1.65$$
$$= (5.35)$$