CH 16

17) 0.20M CH_3NH_3Cl

(A) $K_a\ CH_3NH_3^+ = \frac{K_w}{K_b} = \frac{1\times10^{-14}}{4.4\times10^{-4}} = 2.27\times10^{-11}$

$[H^+] = \sqrt{0.20 * 2.27\times10^{-11}} = 2.13\times10^{-6}$

$pH = -\log 2.13\times10^{-6} = \boxed{5.67}$

(B) 0.030M LiCN

$K_b\ CN^- = \frac{K_w}{K_a} = \frac{1\times10^{-14}}{4.9\times10^{-16}} = 2.04\times10^{-5}$

$[OH^-] = \sqrt{0.030 * 2.04\times10^{-5}} = 7.82\times10^{-4}$

$pOH = -\log 7.82\times10^{-4} = 3.11$

$pH = 14 - pOH = \boxed{10.89}$

(C) 0.14M $RbNO_2$

$K_b\ NO_2^- = \frac{K_w}{K_a} = \frac{1\times10^{-14}}{4.5\times10^{-4}} = 2.2\times10^{-11}$

$[OH^-] = \sqrt{0.14 * 2.2\times10^{-11}} = 1.75\times10^{-6}$

$pOH = 5.75$

$pH = 14 - pOH = \boxed{8.25}$

CH 16

17 B) 0.34 M NH_4ClO_3

$$K_a\ NH_4^+ = \frac{K_w}{K_b} = \frac{1 \times 10^{-14}}{1.8 \times 10^{-5}} = 5.56 \times 10^{-10}$$

$$[H^+] = \sqrt{0.34 * 5.56 \times 10^{-10}} = 1.37 \times 10^{-5}$$

$$pH = -\log 1.37 \times 10^{-5} = 4.86$$