A. (2.0 pts.) Determine the pH of a buffer solution that is 0.15M in HF and 0.25M in NaF. $K_a$ for HF = $3.5 \times 10^{-4}$.

B. (2.0 pts.) Determine the $[H^+]$ and pH of a buffer solution prepared by dissolving 0.10 moles of NH$_3$ and 0.15 moles of NH$_4$NO$_3$ in 1.00L of solution. $K_b$ for NH$_3$ = $1.8 \times 10^{-5}$.

C. (1.0 pts.) Determine the [ClO\(^-\)] required in a 0.20M HClO solution to produce a buffer solution having a pH of 7.48. $K_a$ for HClO = $3.5 \times 10^{-8}$.

D. (1.0 pts.) Determine the pH and percent by hydrolysis for 0.10M NaCN solution. $K_a$ for HCN = $4.0 \times 10^{-10}$.

E. (4.0 pts.) Write balanced net ionic equations for the reactions expected when aqueous solutions of each of the following are mixed. Indicate the form of the equilibrium constant in terms of other constants such as $K_a$, $K_b$, and $K_w$.

*1. KNO$_2$ + HI

2. H$_2$SO$_3$ + NaOH

3. H$_2$SO$_4$ + NaOH

4. NaCN + H$_2$O