Unit 8 – Chapter 14: Acids & Bases **Name _____**

Assignment #3: Calculating K_a, $[OH^-]$, pH, pOH **Period _____**

1) A 0.15 *M* solution of a weak acid is 3.0% dissociated. Calculate K_a.

2) The pH of a 1.00 X 10^{-2} *M* solution of cyanic acid (HOCN) is 2.77 at 25^0C. Calculate K_a for the HOCN from this result.

3) Use Table 14.3 to help answer the following questions.
   a. Which is the stronger acid: $HClO_4$ or $C_6H_5NH_3^+$?
   b. Which is the stronger acid: H_2O or $C_6H_5NH_3^+$?
   c. Which is the stronger acid: $C_6H_5NH_3^+$ or $CH_3NH_3^+$?

4) Calculate $[OH^-]$, pOH, and pH for each of the following.
   a. 0.00040 *M* $Ca(OH)_2$
   b. a solution containing 25 g of KOH per liter
   c. a solution containing 150.0 g of NaOH per liter

5) The K_b values for ammonia and methylamine are 1.8 X 10^{-5} and 4.4 X 10^{-4}, respectively. Which is the stronger acid: NH_4^+ or $CH_3NH_3^+$?

6) Calculate the pH of each of the following solutions.
   a. 0.10 *M* CH_3NH_3Cl
   b. 0.050 *M* NaCN

7) Calculate the pH of each of the following solutions.
   a. 0.12 *M* KNO_2
   b. 0.45 *M* NaOCl
   c. 0.40 *M* NH_4ClO_4

8) Are solutions of the following salts acidic, basic, or neutral? For those that are not neutral, write balanced equations for reactions causing the solution to be acidic or basic. The relevant K_a and K_b values are found in Tables 14.2 and 14.3.

a. KCl
b. $NH_4C_2H_3O_2$
c. CH_3NH_3Cl
d. KF
e. NH_4F
f. CH_3NH_3CN