Name: _____ Date: _____

Acid Equilibrium Practice Test

1. Explain the difference between the terms “concentrated” and “dilute” with respect to both strong and weak acids.

2. A reaction occurs according to the following equation:

   $$HCO_3^- + HCN \rightleftharpoons H_2CO_3 + CN^-$$

   a. Identify the acid, base, conjugate acid and conjugate base.
   b. Is the base in this reaction an Arrhenius base, a Bronsted-Lowry base or both? How do you know?
   c. Identify the substance in the reaction that is amphoteric.

3. Write the products for this reaction, then identify the acid, base, conjugate acid and conjugate base.

   $$HSO_4^- (aq) + CH_3NH_2 (aq) \rightleftharpoons \_\_?\_\_$$

4. What is the pH for 3.00×10^{-4} mol/L barium hydroxide solution?

5. Consider two solutions: 0.035 mol/L solution of HNO_3 and a 0.035 mol/L solution of HF.
   a. What is the difference in pH for these solutions? Show all of your work.
   b. Why is the pH not the same for these solutions, considering they have the same concentration?

6. What is the $[H^+]$, $[OH^-]$, pH and pOH for a 8.9×10^{-3} M solution of methylamine, CH_3NH_2?

7. A solution of hydrochloric acid with an unknown concentration and a volume of 25.00 mL is neutralized with 34.20 mL of 0.2463 mol/L sodium hydroxide. What is the concentration of the hydrochloric acid?

8. A solution of phosphoric acid with an unknown concentration and a volume of 10.00 mL is neutralized with 7.98 mL of 0.10 mol/L sodium hydroxide. What is the pH of the phosphoric acid? (assume phosphoric acid only loses one hydrogen ion)