1. If you were to mix the following solutions, which one would result in a buffer?
   a. 5 mL of .1 M hydrochloric acid and 10 ml of .04 M formic acid
   b. 5 mL of .01 M sodium hydroxide and 10 ml of .01 M sodium formate
   c. 10 mL of .01 M hydrochloric acid and 20 ml of .005 M sodium formate
   d. 10 mL of .01 M sodium hydroxide and 10 ml of .1 M formic acid.

2. If 10 mL of .1 M oxalic acid is added to 200 mL of .5 M sodium oxalate, the final pH of a solution of the solution is 6. What is the pKa of oxalic acid?
   a. 10^{-4}
   b. 10^{-5}
   c. 4
   d. 5

3. If 10 mL of .05 M sodium hydroxide is added to 50 mL of .02 M acetic acid, what is the final pH of the solution? The K_a of acetic acid is is 10^{-5}.
   a. 4
   b. 6
   c. 7
   d. 5

4. In a titration of diethylamine with hydrochloric acid, 50 mL of .01 M hydrochloric acid was required to reach the equivalence point of the titration. If you started with 10 ml of the diethyl amine solution, what was the solution's original molarity?
   a. .05 M
   b. .01 M
   c. .005 M
   d. .001

5. Find the pH when 625 mL of 0.2 M HBr is mixed with 500 mL of 0.5 M charged base that has a K_b of 5.0×10^{-10}
   a. 5.6
   b. 7.0
   c. 6.4
   d. 3.3

6. Determine the pH at the equivalence point when 0.1 M LiOH is titrated with 100 mL of 0.5 M CH_3COOH ($K_a = 1.8 \times 10^{-5}$)
   a. 7.3
   b. 7
   c. 8.8
   d. 5.2

7. For which of the following following equations must we assume that that autoprotolysis is negligible during the its derivation?
   a. $[OH^-] = (K_b \cdot C_b)^{0.5}$
   b. $[OH^-] = K_b(C_b/C_a)$
   c. $[OH^-] = C_b$
   d. All of these.

8. How many equations do you need to set up in order to find the pH of a 0.2 M weak diprotic acid with a $K_{a1} = 10^{-5}$ and $K_{a2} = 10^{-9}$?
   a. 1
   b. 4

c. 5
d. 2
e. 3