CHE 301   EXAM 2   Name _____

1. Calculate the molar ratio of ethylamine ($CH_3CH_2NH_2$) to the ethylammonium ion ($CH_3CH_2NH_3^+$) in a solution with a pH of 10.0. pK_a for $CH_3CH_2NH_3^+ = 10.6$

2. Estimate solubility(in molarity units) of $Mg(OH)_2$ at pH 12. $K_{SP}(Mg(OH)_2) = 6*10^{-10}$

3. Calculate pH of **0.05M** solution of **potassium hydrogen carbonate**. $pK_1 = 6.35$, $pK_2 = 10.33$

4. Oxalic acid (**$H_2C_2O_4$**) has $pK_{a1} = 1.25$ and $pK_{a2} = 4.26$. At what pH is the $HC_2O_4^-$ concentration equal to the $C_2O_4^{2-}$ concentration?

5. Use your textbook to select the suitable indicator for the titration of formic acid with NaOH.

6. Estimate molarity of silver ions **Ag^+** in a mixture that contains silver chloride **AgCl** and **10^{-3}** M KCl. **$K_{SP}(AgCl) = 1.8*10^{-10}$**.

7. In which form **pyridine** ($pK_a = 5.23$) exists at pH 3.35?

8. A sample of food (1.00 g) was mixed with appropriate amount of water and titrated using silver electrode with 0.0200 M $AgNO_3$. The volume necessary to reach the ending point was 5.0 mL. Calculate the %% of NaCl in the food sample.

9. Calculate the conditional formation constant K_f' for the formation of an EDTA complex with zinc(II) at a pH of 3.0, if log $K_f = 16.5$. From your result, is it possible to titrate Zn(II) with EDTA at this pH? Why?

10. At pH 4, the predominant form of **arsenate** ion is _____