CHM 1220-Dang **Chapter 16-Reading Assignment** **Name**

1. Define a Bronsted acid and Bronsted base. Give an example and determine the acid-base conjugate pairs

2. Characterize the following chemicals as a Brønsted-Lowry acid, base, or both

	Acid/Base/Both (i.e amphoteric)
H_2CO_3	
HSO_3^-	
NO_2^-	
KOH	
H_3O^+	
N_2H_4	

3. List the conjugate acids for each of the following:

^-OH _____ HPO_4^{-2}_____ CrO_4^{-2}_____

List the conjugate bases for each of the following:

H_2O _____ HPO_4^{-2}_____ $CH_3NH_3^+$_____

4. If you mixed an equal amount of acid and base, in which direction would it favor at equilibrium? Using the conjugate acid-base strength to support your answer. (Do not use K_a or K_b)

5. Choose from the conjugate acid–base pairs HSO_4^-/SO_4^{2-}, HF/F^- and NH_4^+/NH_3 to complete the following equation with the pair that gives an equilibrium constant $K_c > 1$. Explain.

_____ + NO_2^- → _____ + HNO_2

6. Write the mathematical equation for calculating the following:

pH = pOH =

7. Complete the table below to describe aqueous solutions.

Classification	Relative ion concentration	pH at 25 °C
		pH < 7
Neutral	$[H_3O^+] = [OH^-]$	
		pH > 7

8. Use the following acidity constants to help answer the questions below:
$K_a(HC_2H_3O_2) = 1.8 \times 10^{-5}$; $K_a(HCN) = 4.9 \times 10^{-10}$; $K_a(HCOOH) = 1.7 \times 10^{-4}$

(a) Which of the three acids is the strongest? _____

(b) Which of the following bases is the weakest: $C_2H_3O_2^-$, CN^-, or $HCOO^-$? _____

(c) What is the pK_a of HCN? _____

(d) What is the K_b for $HCOO^-$?_____

9. Write the chemical equation for the ionization of $C_6H_5NH_3^+$ and its corresponding K_a equation and value.

10. Write the chemical equation for the base ionization of $C_6H_5NH_2$ and its corresponding K_b equation and value.

11. Use the chemical equations and K expressions from 9 and 10 above to show that $K_a * K_b$ for a conjugate acid-base pair is equal to K_w.

12. Write the Lewis structures of the reactants and product of each of the following equations, and identify the Lewis acid and the Lewis base in each:

$CS_2 + SH^- \rightarrow HCS_3^-$