CHEM 1105

ANSWERS TO PROBLEM SET 6

1.	(a) $N_2 H_5^+$	(b) HS ⁻	(c) HPO_4^{2-}	(d) H_2SO_4	
2.	(a) $N_2 H_3^-$	(b) HO ⁻	(c) NH ₃	(d) CO_3^{2-}	
3.	(a) $pH = 7.6$ BASIC		(b) $pH = 1.9$ ACIDIC	(b) $pH = 1.9$ ACIDIC	
	(c) $pH = 10.4$ BASIC		(d) $pH = 5.9$ ACIDIC		
4.	(a) $[H^+] = antilog - 5.9 = 1.3 \times 10^{-6}$				
	(b) $pH = 4.7 pOH = 14 - 4.7 = 9.3$				
	$[OH^{-}] = antilog - 9.3 = 5.0 \times 10^{-10}$				
	(c) $pH = 11.4 pOH = 14 - 11.4 = 2.6$				
	$[NaOH] = [OH^-] = antilog -2.6 = 2.5 \times 10^{-3}$				
	mass NaOH = 0.650 L x $\frac{0.0025 \text{ mol NaOH}}{1 \text{ L}}$ x $\frac{40.0 \text{ g NaOH}}{1 \text{ mol NaOH}}$ = 0.065 g NaOH (d) [H ⁺] = antilog -5.4 = 4.0 x 10 ⁻⁶ = [HI]				
	mass HI = $0.0250 \text{ L x} \frac{4.0 \text{ x } 10^{-6} \text{ mol HI}}{1 \text{ L}} \text{ x } \frac{127.9 \text{ g HI}}{1 \text{ mol HI}}$ = $1.3 \text{ x } 10^{-5} \text{ g HI}$				
5.	(a) HF weak acid	(b)	$) \mathrm{NH_4^+}$ weak acid	(c) CN ⁻ weak base	
	(d) H_2SO_4 strong a	icid (e)	LiOH strong base	(f) NH ₃ weak base	
	(g) HNO ₃ strong ac	eid (h)) H ₂ S weak acid	(i) CH ₃ COO ⁻ weak base	
	(j) KOH strong bas	se (k)	$H_2PO_4^-$ weak acid <u>and</u> we	ak base	
6.	$CH_3CHO + (CH_3)_2SH^+ \rightleftharpoons CH_3CHOH^+ + (CH_3)_2S$				

BASE ACID ACID BASE