CHE112   EXAM 2

1.Write formula of the conjugate acid for following Broensted bases:

HPO_4^{2-} HCO_3^-
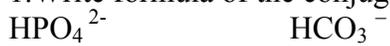
2.Write formula of the conjugate base for following Broensted acids:

$HClO_4$ HCO_3^-

3. Draw the Lewis formula of   H-O-Cl=O   Is it base or acid or both? Strong or weak? Why?
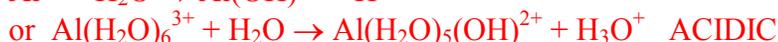A weak acid

4. What is the pH of 1 M solution of $HClO_4$?   0

5. What is the pH of 0.1 M solution of NaOH? 13

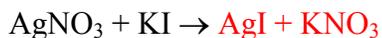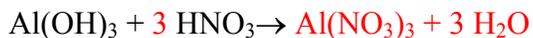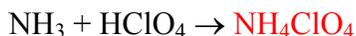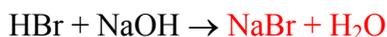6. What is the pH of 0.2 M lactic acid ($K_a = 1.4\times10^{-4}$) ?   2.3

7. Aqueous solution of $AlCl_3$ – is it acidic, neutral , or basic? Write an equation to explain why.
$Al^{3+} + H_2O \rightarrow Al(OH)^{2+} + H^+$
or $Al(H_2O)_6^{3+} + H_2O \rightarrow Al(H_2O)_5(OH)^{2+} + H_3O^+$ ACIDIC

8. Aqueous solution of NaBr – is it acidic, neutral, or basic? Explain why.
NEUTRAL

10-15. Balance following equations:

$HBr + NaOH \rightarrow NaBr + H_2O$

$NH_3 + HClO_4 \rightarrow NH_4ClO_4$

$Al(OH)_3 + 3 HNO_3 \rightarrow Al(NO_3)_3 + 3 H_2O$

$Al(OH)_3 + KOH \rightarrow K [Al(OH)_4]$

$AgNO_3 + KI \rightarrow AgI + KNO_3$

16. Estimate the solubility of copper in a saturated solution of CuBr in water ($K_{SP} = 5.3\times10^{-9}$).
 Solubility $= \sqrt{K_{sp}} = 7 \times10^{-5}$ M

17. Estimate the solubility of lead ion in 0.01 M Na_2SO_4 (K_{SP} ($PbSO_4$)$= 1.6 \times10^{-8}$).

Solubility $= K_{sp} / [SO_4^{2-}] = 1.6\times10^{-6}$ M