Chem I Acid Base Quiz Review Name: _____

1) Label the acid (A), base (B), conjugate acid (CA) and conjugate base (CB) in the following reactions:

HSO_4^{-1} + HCO_3^{-1} --- H_2CO_3 + SO_4^{-2} HSO_4^{-1} + H_2SO_3 ---- H_2SO_4 + HSO_3^{-1}

____ ____ ____ ____ ____ ____ ___ ___

2) For the above reactions, draw in the reaction arrows correctly (which direction would be dominant?)

3) Put a star by the strongest acid: benzoic citric formic carbonic

4) Circle any organic acids from #3.

5) Water is a weak acid - what does "weak" mean exactly in this context? _____

_____

5) Which of these two species could be amphoteric? OH^{-1} or HCO_3^{-1}

6) Write two equations showing the species you chose acting first as an acid, then as a base:

_____

_____

7) Draw Lewis Structures for all of the following reactants and products: HCN + OH^{-1} → _____ + _____?

→

8) Formulas: Write formulas for the following acids:

a) nitric acid _____ b) chlorous acid _____ c) benzoic acid _____

d) hydroiodic acid _____ e) sulfuric acid _____ f) acetic acid _____

9) Write products and balance the following Arrhenius neutralization reactions:

a) ___KOH + ___ H_2CO_3 → _____ + _____

b) ___HIO_3 + ___ $Ca(OH)_2$ → _____ + _____

10) Find the pH of the following dilute acid and base solutions:

a) 0.02 M HCl pH = _____ b) 0.75 M NaOH pH = _____ c) 0.22 M HCl pH = _____

11) Find the [H_3O^+] of solutions with the following pH values:

a) pH = 7.1 [H_3O^+] = _____ b) pH = 6.5 [H_3O^+] = _____

12) Find the pOH of a solution with:

a) pH = 2.2 pOH = _____ b) [H_3O^+] = 6.7×10^{-12} pOH = _____

13) Label the following as acid (A), base (B) or neutral (N):

a) pH = 3.7 _____ b) pOH = 10.0 _____ c) $[H_3O^+]$ = 0.07 _____

14) Titration! You have a solution of HCl with an unknown molarity. You titrate this acid with a standard solution of 0.15 M NaOH. You titrate 75.0 mL of the acid with 95.0 mL of the NaOH. Find the molarity of this HCl solution.

EQ with known values
below reactants:

show work:

15) Titration, again! You have a solution of $Mg(OH)_2$ with an unknown molarity. You titrate this base with a standard solution of 2.5 M HBr.

Your data: $Mg(OH)_2$ used = 25.0 mL
buret start HBr = 7.8 mL
buret end HBr = 17.8 mL

EQ with known values
below reactants:

show work: