Chem 151 Lecture Quiz #5 Name _____
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USE SCANTRONS (each question is worth 3 points; extra points = bonus points)

Potentially useful info.: molarity (M) = #moles/L; #moles = MxV, acids = H^+ donor, bases = OH^- donor; at endpoint #moles H^+ = #moles OH^-; $M_1V_1 = M_2V_2$; pH = -log[H^+]; [H^+][OH^-]=10^{-14}; pH+pOH=14; pOH = -log[OH^-]; [H^+] = 10^{-pH}= antilog(-pH). pH = pK_a + log [base/acid]
pH = pK_a + log [A^-/HA] where HA = weak acid.

C (1) Choose the false description of acids: a) A proton donor according to Arrhenius.
b) Sour-tasting c) A proton acceptor according to Bronsted-Lowry
d) Tends to lower the pH of a solution. e) Reacts with hydroxides to form water and a salt.

C (2) Choose the correct description of bases. a) A proton acceptor according to Arrhenius
b) A hydroxide donor according to Bronsted-Lowry. c) Tends to raise the pH of a solution.
d) Can dissociate to produce hydroxyl groups. e) Reacts with water to form hydronium (H_3O^+) ions.

D (3) Complete the sentence by choosing the best phrase describing buffers: "A buffer …"
a) must contain any weak acid and any weak base. b) contains a strong acid and a strong base.
c) always has a pH of 7. d) has an optimum buffering capacity at pH = pK_a ±1.

A (4) For the chemical reaction at right, choose the best statement: NH_3 + HCOOH <==> NH_4^+ + $COOH^-$
a) NH_3 acts as a weak base. b) NH_3 is the conjugate base of HCOOH.
c) NH_4^+ is the conjugate acid of $COOH^-$. d) HCOOH acts a weak base. e) none of these.

A (5) Suppose that 20.0 mL of HCl requires 32.0 mL of 0.100 M NaOH to reach the end point. What is the concentration of the HCl solution? a) 0.160 M b) 0.080 M c) 6.00M d) .100 M

B (6) Which of the following is incorrectly named?
a) HNO_2=nitrous acid b) HClO=chlorous acid c) HBr=hydrobromic acid d) Na_2SO_3=sodium sulfite

B (7) When a certain acid and a certain base are mixed, water and what other product is most likely to form? a) CH_3COOH b) KCl c) NaOH d) HCl e) O_2

E (8) A strong acid is best defined as: a) a concentrated acid. b) a dilute acid. c) a polyprotic acid.
d) an acid that reacts completely with a base. e) an acid that ionizes completely in water.

A (9) What is the acid anhydride of carbonic acid? a) CO_2 b) HCO_3^- c) H_2CO_3 d) $H_3CO_3^+$

B (10) How much 12 M HCl is needed to prepare 100 mL of 0.60 M HCl solution?
a) 0.75 mL b) 5 mL c) 25 mL d) 50 mL e) 200 mL

C (11) What is the [OH^-] for a pH 3.5 solution?
a) $1x10^{-3.5}$ M b) 10.5 M c) $1x10^{-10.5}$ M d) 3.5 M e) $1x10^{-7}$ M

B (12) What is the pH of a buffer containing a mixture of 0.11 M acetic acid (HA) and .011 M sodium acetate (NaA)? The pK_a of acetic acid is 5.2. a) 5.2 b) 4.2 c) 6.2 d) 7 e) 3.3