Chem 117 Jasperse Quiz 6 Chapter 8 Name:
Due: Wednesday, November 17

1. What is $[H^+]$ when $[OH^-] = 2.46 \times 10^{-4}$ M?

2. What is the pH when $[H^+] = 5.31 \times 10^{-8}$ M?

3. What is the pH when $[OH^-] = 4.11 \times 10^{-10}$ M

4. What is $[H^+]$ when the pH = 5.66?

5. What is the molarity of HCl when 26.2 grams of HCl is dissolved in enough water so that the final solution has a volume of 356 mL?

6. How many moles of HCl would be present in 325 mL of a 0.88 M solution of aqueous HCl solution?

7. How many grams of NaOH would be present in 175 mL of a 0.56 M solution of aqueous NaOH?

8. Which of the following would have a pH of >7:
   a. $[H^+] = [OH^-]$
   b. $[H^+] > [OH^-]$
   c. $[OH^-] = 2.46 \times 10^{-10}$ M
   d. $[H^+] = 5.31 \times 10^{-4}$ M
   e. $[H^+] = 5.31 \times 10^{-8}$ M

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9. Draw the conjugate base for HNO_2.

10. Draw the conjugate acid for PO_4^{-3}.

11. Which of the following statements is false

    a. HCl is a strong acid.
    b. NaOH is a strong base.
    c. CH_3NH_2 is a weak base
    d. HCO_3^- is a weak base
    e. CH_4 is an acid

12. Which of the following statements is false.
    a. If 788 molecules of HCl are dissolved in water, they would all ionize. You'd have zero H-Cl bonds in the solution, but instead you'd produce 788 Cl^- ions.
    b. If 788 molecules of HCN is dissolved in water, they would all ionize. You'd have zero H-CN bonds, but instead you'd produce 788 CN^- ions.
    c. If 788 molecules of HCN is dissolved in water, some but not all would ionize. You'd have some H-CN bonds in solution, but also a few (less than 788) CN^- ions.
    d. If 788 molecules of NaOH is dissolved in water, they would all ionize. You'd have zero Na-OH bonds, but instead you'd produce 788 Na^+ ions.
    e. If 788 molecules of NH_3 is dissolved in water, some but not all NH_3's would ionize. You'd have plenty of neutral NH_3 molecules, but also some $NH4^+$ ions.

13. Suppose you have a buffer solution, with HF and F^- ions. Which of the following is false?
    a. All buffers need both a weak acid and a conjugate weak base
    b. If HCl was added, it would get eaten up by the basic F^- ions
    c. If NaOH was added, it would get eaten up by the acid HF
    d. When HCl was added, there would be no change whatsoever in the solution pH. When acids or bases are added to a buffer, there is never any change at all in the pH.
    e. The pH would change slightly if HCl was added, because some HF would be produced. The change would be limited because instead of a strong acid (HCl), only a weak acid (HF) would result.

14. Draw the equilibrium reaction that occurs when weak acid HF is mixed with water. (Show HF and water as the reactants on the left side). For each of the chemicals in the equation, write "acidic" or "basic" underneath them. Then draw an arrow from HF to its "conjugate", and draw an arrow from water to its "conjugate". (3 points)

Did you remember to write your name on the front?