Date Planned : __ / __ / __	Daily Tutorial Sheet-1	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Advanced (Archive)	Exact Duration :_____

1. Of the given anions, the strongest base is: **(1981)**

  (A) ClO^- **(B)** ClO_2^- **(C)** ClO_3^- **(D)** ClO_4^- ▶

2. At $90°C$, pure water has $\left[H_3O^+\right]$ as $10^{-6} mol\ L^{-1}$. What is the value of K_w at $90°C$? **(1981)**

  (A) 10^{-6} **(B)** 10^{-12} **(C)** 10^{-14} **(D)** 10^{-8}

3. The pH of $10^{-8} M$ solution of HCl in water is: **(1981)**

  (A) 8   **(B)** –8   **(C)** between 7 and 8   **(D)** between 6 and 7

4. An acidic buffer solution can be prepared by mixing the solution of: **(1981)**

  (A) acetate and acetic acid

  (B) ammonium chloride and ammonium hydroxide

  (C) sulphuric acid and and sodium sulphate

  (D) sodium chloride and sodium hydroxide

5. How many moles of sodium propionate should be added to 1 L of an aqueous solution containing 0.020 mole of propionic acid to obtain a buffer solution of pH 4.75? What will be pH if 0.010 moles of HCl are dissolved in the above buffer solution. Dissociation constant of propionic acid, at $25°C$ is 1.34×10^{-5}. **(1981)**

6. Give reason for the statement that "the pH of an aqueous solution of sodium acetate is more than seven". **(1982)**

7. The precipitate of CaF_2, $(K_{sp} = 1.7 \times 10^{-10})$ is obtained, when equal volumes of which of the following are mixed? **(1982)**

  (A) $10^{-4} M\ Ca^{2+} + 10^{-4}\ M\ F^-$ **(B)** $10^{-2}\ M\ Ca^{2+} + 10^{-3}\ M\ F^-$

  (C) $10^{-5}\ M\ Ca^{2+} + 10^{-3}\ M\ F^-$ **(D)** $10^{-3}\ M\ Ca^{2+} + 10^{-5}\ M\ F^-$

8. 20 mL of 0.2 M sodium hydroxide is added to 50 mL of 0.2 M acetic acid solution to give 70 mL of the solution. What is the pH of this solution? **(1982)**

  Calculate the additional volume of 0.2 M NaOH required to make the pH of the solution 4.74. (Ionisation constant of $CH_3COOH = 1.8 \times 10^{-5}$)

9. Aluminium chloride ($AlCl_3$) is a Lewis acid because it can donate electrons. (True/False) **(1982)**

10. The conjugate base of HSO_4^- in aqueous solution is..... **(1982)**

11. The dissociation constant of a weak acid HA is 4.9×10^{-8}. After making the necessary approximations, calculate **(1983)**

  (i) pH

  (ii) OH^- concentration in a decimolar solution of the acid. (Water has a pH of 7).

12. A solution contains a mixture of Ag^+(0.10 M) and Hg^{2+}(0.10 M) which are to be separated by selective precipitation. Calculate the maximum concentration of iodide ion at which one of them gets precipitated almost completely. What percentage of first metal ions is precipitated when precipitation of other metal starts **(1984)**

$K_{sp} : AgI = 8.5 \times 10^{-17}, HgI_2 = 2.5 \times 10^{-26}$

13. 500 mL of 0.2 M aqueous solution of acetic acid is mixed with 500 mL of 0.2 M HCl at $250°C$. **(1984)**

(i) Calculate the degree of dissociation of acetic acid in the resulting solution and pH of the solution.

(ii) If 6g of NaOH is added to the above solution, determine the final pH (assuming there is no change in volume on mixing, K_a of acetic acid is $1.75 \times 10^{-5} \, mol / L$).

14. A certain weak acid has a dissociation constant of 1.0×10^{-4}. The equilibrium constant for its reaction with a strong base is: **(1984)**

(A) 1.0×10^{-4} **(B)** 1.0×10^{-10} **(C)** 1.0×10^{10} **(D)** 1.0×10^{14} ⊙

15. A certain buffer solution contains equal concentration of X^- and HX. The K_b for X^- is 10^{-10}. The pH of the buffer is: **(1984)**

(A) 4 **(B)** 7 **(C)** 10 **(D)** 14 ⊙