Time : 5 Hour | STD 11 Science chemistry | Total Marks : 500

kd700+ neet target ch-6 equilibrium (Ionic) part -2

*** Chemistry** [500]

1. Amongst the given options which of the following molecules/ ion acts as a Lewis acid?
   (A) OH^- (B) NH_3 (C) H_2O (D) BF_3

2. The pH of the solution containing $50\,mL$ each of $0.10\,M$ sodium acetate and $0.01\,M$ acetic acid is ....
   [Given pK_a of $CH_3COOH = 4.57$]
   (A) 3.57 (B) 4.57 (C) 2.57 (D) 5.57

3. Which among the following salt solutions is basic in nature?
   (A) Sodium acetate (B) Ammonium chloride
   (C) Ammonium sulphate (D) Ammonium nitrate

4. The solubility product for a salt of the type AB is 4×10^{-8}. What is the molarity of its standard solution?
   (A) $4 \times 10^{-4}\ mol/L$ (B) $2 \times 10^{-4}\ mol/L$ (C) $16 \times 10^{-16}\ mol/L$ (D) $2 \times 10^{-16}\ mol/L$

5. Find out the solubility of $Ni(OH)_2$ in $0.1 M NaOH$.
   Given that the Ionic product of $Ni(OH)_2$ is 2×10^{-15}
   (A) $1 \times 10^{8}\ M$ (B) $2 \times 10^{-13}\ M$
   (C) $2 \times 10^{-8}\ M$ (D) $1 \times 10^{-13}\ M$

6. Conjugate base for Bronsted acids H_2O and HF are
   (A) OH^- and H_2F^+ respectively
   (B) H_3O^+ and F^-, respectively
   (C) OH^- and F^-, respectively
   (D) H_3O^+ and H_2F^+, respectively

7. The pH of $0.01\ M\ NaOH(aq)$ solution will be
   (A) 7.01 (B) 2 (C) 12 (D) 9

8. pH of a saturated solution of $Ca(OH)_2$ ts 9. The solublity product (K_{sp}) of $Ca(OH)_2$ is
   (A) 0.5×10^{-15} (B) 0.25×10^{-10}
   (C) 0.125×10^{-15} (D) 0.5×10^{-10}

9. Which will make basic buffer?
   (A) $50mL$ of $0.1 M NaOH + 25mL$ of $0.1 M CH_3COOH$

(B) $100 \mathrm{mL}$ of $0.1 \mathrm{M} \mathrm{CH_3COOH} + 100 \mathrm{mL}$ of $0.1 \mathrm{M} \mathrm{NaOH}$

(C) $100 \mathrm{mL}$ of $0.1 \mathrm{M} \mathrm{HCl} + 200 \mathrm{mL}$ of $0.1 \mathrm{M} \mathrm{NH_4OH}$

(D) $100 \mathrm{mL}$ of $0.1 \mathrm{M} \mathrm{HCl} + 100 \mathrm{mL}$ of $0.1 \mathrm{M} \mathrm{NaOH}$

10. Following solutions were prepared by mixing different volumes of $NaOH$ and HCl of different concentrations

(a) $60 \text{ mL} \frac{\mathrm{M}}{10} \text{ HCl} + 40 \text{ mL} \frac{\mathrm{M}}{10} \text{ NaOH}$

(b) $55 \text{ mL} \frac{\mathrm{M}}{10} \text{ HCl} + 45 \text{ mL} \frac{\mathrm{M}}{10} \text{ NaOH}$

(c) $75 \text{ mL} \frac{\mathrm{M}}{5} \text{ HCl} + 25 \text{ mL} \frac{\mathrm{M}}{5} \text{ NaOH}$

(d) $100 \text{ mL} \frac{\mathrm{M}}{10} \text{ HCl} + 100 \text{ mL} \frac{\mathrm{M}}{10} \text{ NaOH}$

pH of which one of them will be equal to 1 ?

(A) (b) (B) (a) (C) (d) (D) (c)

11. Concentration of the Ag^+ ions in a saturated solution of $Ag_2C_2O_4$ is $2.2 \times 10^{-4} \, mol \, L^{-1}$. Solubility product of $Ag_2C_2O_4$ is

(A) 2.66×10^{-12} (B) 4.5×10^{-11} (C) 5.3×10^{-12} (D) 2.42×10^{-8}

12. The solubility of $AgCl_{(s)}$ with solubility product 1.6×10^{-10} in $0.1 \, M \, NaCl$ solution would be

(A) $1.26 \times 10^{-5} \, M$ (B) $1.6 \times 10^{-9} \, M$ (C) $1.6 \times 10^{-11} \, M$ (D) zero.

13. The percentage of pyridine (C_5H_5N) that forms pyridinium ion $(C_5H_5N^+H)$ in a $0.10 \, M$ aqueous pyridine solution (K_b for $C_5H_5N = 1.7 \times 10^{-9}$) is

(A) 0.0060% (B) 0.013% (C) 0.77% (D) 1.6%

14. What is the pH of the resulting solution when equal volumes of $0.1 \, M \, NaOH$ and $0.01 \, M \, HCl$ are mixed?

(A) 2 (B) 7 (C) 1.04 (D) 12.65

15. Which one of the following pairs of solution is not an acidic buffer?

(A) CH_3COOH and CH_3COONa (B) H_2CO_3 and Na_2CO_3

(C) H_3PO_4 and Na_3PO_4 (D) $HClO_4$ and $NaClO_4$

16. Which of the following salts will give highest pH in water?

(A) KCl (B) $NaCl$ (C) Na_2CO_3 (D) $CuSO_4$

17. The pH of $1 \; N \; H_2O$ is

(A) 7 (B) > 7 (C) < 7 (D) 0

18. The pH of $10^{-7} N \, HCl$ is

(A) 6 (B) 6.97 (C) 8 (D) 10

19. What is the PH of $10^{-9} \, M$ aqueous HCl solution

(A) 9 (B) between 6 to 7 (C) 7 (D) can't determine

20. If a solution of $10^{-6}\,M\,HCl$ is diluted 100 times, the pH of solution is

(A) 8 (B) 6 (C) 6.96 (D) 7.04

21. Which of the following has highest pH

(A) $0.1\,M\,HCl$ (B) $0.2\,M\,HCl$ (C) $0.1\,M\,CH_3COOH$ (D) $0.15\,M\,HNO_3$

22. If two acids of equimolar concentration are taken then which option is correct

(A) $\alpha_1^2\,K_{a_1} = \alpha_2^2\,K_{a_2}$ (B) $\alpha_1 K_{a_1}^2 = \alpha_2\,K_{a_2}^2$ (C) $\alpha_1^2\,K_{a_2} = \alpha_2^2\,K_{a_1}$ (D) $\alpha_1 K_{a_2}^2 = \alpha_2\,K_{a_1}^2$

23. Number of equivalents of H_2SO_4 present in $100\,mL$ of its solution. Whose pH is 5.

(A) 10^{-4} (B) 10^{-6} (C) 10^{-2} (D) 10^{-5}

24. The aqueous solution of ammonium chloride is

(A) Neutral (B) Basic (C) Acidic (D) Amphoteric

25. Hydrolysis constant for a salt of weak acid and weak base would be

(A) $K_h = \frac{K_w}{K_a}$ (B) $K_h = \frac{K_w}{K_b}$ (C) $K_h = \frac{K_w}{K_aK_b}$ (D) None of these

26. In hydrolysis of a salt of weak acid and strong base, $A^- + H_2O \rightleftharpoons HA + OH^-$, the hydrolysis constant (K_h) is equal to....

(A) $\frac{K_w}{K_a}$ (B) $\frac{K_w}{K_b}$ (C) $\sqrt{\frac{K_a}{C}}$ (D) $\frac{K_w}{K_a \times K_b}$

27. On adding solid potassium cyanide to water

(A) pH will increase

(B) pH will decrease

(C) pH will not change

(D) Electrical conductance will not change

28. pH of $NaCl$ solution is

(A) 7 (B) 0 (C) > 7 (D) < 7

29. A solution of sodium chloride in contact with atmosphere has a pH of about

(A) 3.5 (B) 5 (C) 7 (D) 1.4

30. By adding $20\;ml$ $0.1\;N\;HCl$ to $20\;ml$ $0.1\;N\;KOH$, the pH of the obtained solution will be

(A) 0 (B) 7 (C) 2 (D) 9

31. $50\,ml$ of $10^{-3}\,M\,HCl$ is mixed with $50\,ml$ of $0.05\,M\,CH_3COOH\,(pK_a = 4.7)$. The degree of dissociation of water in the resulting solution is

(A) 1.8×10^{-13} (B) 1.8×10^{-15} (C) 1.8×10^{-14} (D) 3.6×10^{-13}

32. If $1\,mL$ of $1\,M\,HCl$ solution is added to $99\,mL$ of aqueous solution of $NaCl$ so that pH of $NaCl$ solution change by X units. The value of X is

(A) 2 (B) 5 (C) 7 (D) 1

33. Match the column I with column II and mark the appropriate choice

Column I	Column II
$(A)\ CH_3COONa$	(i) Almost neutral, $pH > 7$ or < 7
$(B)\ NH_4Cl$	(ii) Acidic, $pH < 7$
$(C)\ NaNO_3$	(iii) Alkaline, $pH > 7$
$(D)\ CH_3COONH_4$	(iv) Neutral, $pH = 7$

(A) $A \rightarrow (i), B \rightarrow (ii), C \rightarrow (iii), D \rightarrow (iv)$

(B) $A \rightarrow (ii), B \rightarrow (iii), C \rightarrow (iv), D \rightarrow (i)$

(C) $A \rightarrow (iii), B \rightarrow (ii), C \rightarrow (iv), D \rightarrow (iv)$

(D) $A \rightarrow (iv), B \rightarrow (i), C \rightarrow (iii), D \rightarrow (ii)$

34. Correct order of pH of $0.1\,M$ solution is

(A) $NaCl < NH_4Cl < NaCN < HCl$

(B) $NaCN < NH_4Cl < NaCl < HCl$

(C) $HCl < NaCl < NaCN < NH_4Cl$

(D) $HCl < NH_4Cl < NaCl < NaCN$

35. A weak acid HX has the dissociation constant $1 \times 10^{-5}\,M$. It forms a salt NaX on reaction with alkali. The percentage hydrolysis of $0.1\,M$ solution of NaX is .... %

(A) 0.0001 (B) 0.01 (C) 0.1 (D) 0.15

36. Approximate pH of $0.01\,M\,NaHA$ is calculated by : ($K_{a_1} = 10^{-6}$ and $K_{a_2} = 10^{-8}$ are ionization constant of H_2A)

(A) $pH = 7 + \frac{pK_{a_1}}{2} + \frac{\log\ C}{2}$ (B) $pH = 7 - \frac{pK_{a_1}}{2} - \frac{\log\ C}{2}$

(C) $pH = \frac{pK_{a_1} + pK_{a_2}}{2}$ (D) $pH = \frac{pK_{a_1} - pK_{a_2}}{2}$

37. The correct formula to calculate the hydroxyl ion concentration of an aqueous solution of NH_4NO_3 is

(A) $\sqrt{\frac{C \times K_w}{K_b}}$ (B) $\sqrt{\frac{K_w \times K_b}{C}}$ (C) $\sqrt{\frac{C \times K_w}{K_a}}$ (D) $\sqrt{\frac{K_a \times K_w}{C}}$

38. A weak acid HX has the dissociation constant $1 \times 10^{-5}\,M$. It forms a salt NaX on reaction with alkali. The percentage hydrolysis of $0.1\,M$ solution of NaX is .... %.

(A) 0.0001 (B) 0.01 (C) 0.1 (D) 0.15

39. What will be the pH of an aqueous solution of $1.0\,M$ ammonium formate ? (Given: $pK_a = 3.8$ and $pK_b = 4.8$)

(A) 7.5 (B) 3.4 (C) 6.5 (D) 10.2

40. Which is the correct representation of the solubility product constant of Ag_2CrO_4

(A) $[Ag^+]^2\,[CrO_4^{-2}]$ (B) $[Ag^+]\,[CrO_4^{-2}]$

(C) $[2Ag^+]\,[CrO_4^{-2}]$ (D) $[2Ag^+]^2\,[CrO_4^{-2}]$

41. If K_{sp} for $HgSO_4$ is 6.4×10^{-5}, then solubility of the salt is

(A) 8×10^{-3} (B) 8×10^{-6} (C) 6.4×10^{-5} (D) 6.4×10^{-3}

42. The solubility of $PbCl_2$ is

(A) $\sqrt{K_{sp}}$ (B) $\sqrt[3]{K_{sp}}$ (C) $\sqrt[3]{\frac{K_{sp}}{4}}$ (D) $\sqrt{8K_{sp}}$

43. If solubility of calcium hydroxide is $\sqrt{3}$, then its solubility product will be

(A) 27 (B) 3 (C) 9 (D) $12\sqrt{3}$

44. K_{sp} for sodium chloride is $36\ mol^2/litre^2$. The solubility of sodium chloride is

(A) $\frac{1}{36}$ (B) $\frac{1}{6}$ (C) 6 (D) 3600

45. What is the minimum concentration of SO_4^{2-} required to precipitate $BaSO_4$ in a solution containing $1.0\times10^{-4}\,mol\ Ba^{2+}$ (K_{sp} for $BaSO_4$ is 4×10^{-10})

(A) $4\times10^{-10}\,M$ (B) $2\times10^{-7}\,M$ (C) $4\times10^{-6}\,M$ (D) $2\times10^{-3}\,M$

46. Solubility product for salt AB_2 is 4×10^{-12}. Calculate solubility

(A) $1\times10^{-3}\,gm\ mol\,/\,litre$ (B) $1\times10^{-5}\,gm\ mol\,/\,litre$

(C) $1\times10^{-4}\,gm\ mol\,/\,litre$ (D) $1\times10^{-2}\,gm\ mol\,/\,litre$

47. K_{sp} for $Cr(OH)_3$ is 2.7×10^{-31}. What is its solubility in moles / litre.

(A) 1×10^{-8} (B) 8×10^{-8} (C) 1.1×10^{-8} (D) 0.18×10^{-8}

48. If the solubility product of lead iodide (PbI_2) is 3.2×10^{-8}, then its solubility in moles/litre will be

(A) 2×10^{-3} (B) 4×10^{-4} (C) 1.6×10^{-5} (D) 1.8×10^{-5}

49. The values of K_{sp} for CuS, Ag_2S and HgS are 10^{-31}, 10^{42} and 10^{-54} respectively. The correct order of their solubility in water is

(A) $Ag_2S > HgS > CuS$ (B) $HgS > CuS > Ag_2S$

(C) $HgS > Ag_2S > CuS$ (D) $Ag_2S > CuS > HgS$

50. The solubility product of As_2S_3 is 2.8×10^{-72}. What is the solubility of As_2S_3

(A) $1.09\times10^{-15}\,mole/litre$ (B) $1.72\times10^{-15}\,mole/litre$

(C) $2.3\times10^{-16}\,mole/litre$ (D) $1.65\times10^{-36}\,mole/litre$

51. If solubility product of $HgSO_4$ is 6.4×10^{-5}, then its solubility is

(A) $8\times10^{-3}\,mole/litre$ (B) $6.4\times10^{-5}\,mole/litre$

(C) $6.4 \times 10^{-3}\, mole/litre$ (D) $2.8 \times 10^{-6}\, mole/litre$

52. Solubility product (K_{sp}) of salts of type MX, MX_2, M_3X at temperature T are 4×10^{-8}, 3.2×10^{-14} and 2.7×10^{-15} respectively. Solubility of the salts at temperature T are in the order

(A) $MX > MX_2 > M_3X$

(B) $M_3X > MX_2 > MX$

(C) $MX_2 > M_3X > MX$

(D) $MX > M_3X > MX_2$

53. MX is a salt formed by neutralisation of strong base, MOH, and weak acid , HX. If the dissociation constant of HX is K_a and solubility product of MX is k_{sp} , then the solubility of MX in aqueous acidic solution may be given as

(A) $\sqrt{k_{sp}}$ (B) $\sqrt{k_{sp}.k_a}$ (C) $\sqrt{k_{sp}.\left(1+\frac{[H^+]}{K_a}\right)}$ (D) $\sqrt{k_{sp}.\left(1+\frac{k_a}{[H^+]}\right)}$

54. A salt MX has $K_{sp} = 4 \times 10^{-10}$. What value of K_{sp} must another salt MX_3 have if the molar solubility of the two salts is to be identical

(A) 3.2×10^{-10} (B) 1.024×10^{-19} (C) 1.78×10^{-5} (D) 4.32×10^{-18}

55. The solubility of $Ba_3(AsO_4)_2$ (molar mass $= 690$) is $6.9 \times 10^{-2}\, g/100\, mL$. What is the value of its K_{sp}?

(A) 1.08×10^{-11} (B) 1.08×10^{-13} (C) 1.0×10^{-15} (D) 6.0×10^{-13}

56. What is the molar solubility of :- $Ag_2CO_3(K_{sp} = 4 \times 10^{-13})$ in $0.1\, M\, Na_2CO_3$ solution?

(A) 10^{-6} (B) 10^{-7} (C) 2×10^{-6} (D) 2×10^{-7}

57. K_{SP} of $Mg(OH)_2$ is 1×10^{-12}. $0.01\, M\, MgCl_2$ will show precipitation in a solution of pH reater than:-

(A) 3 (B) 9 (C) 6 (D) 8

58. Solubility product expression of salt MX_4 which is sparingly soluble with a solubility (S) can be given as

(A) $256S^5$ (B) $16S^3$ (C) $5S$ (D) $25S^4$

59. Zirconium phosphate $[Zr_3(PO_4)_4]$ dissociates into three zirconium cations of charge $+4$ and four phosphate anions of charge -3. If molar solubility of zirconium phosphate is denoted by S and its solubility product by K_{sp} then which of the following relationship between S and K_{sp} is correct?

(A) $S = \{K_{sp}/144\}^{1/7}$

(B) $S = \left\{K_{sp}/(6912)^7\right\}$

(C) $S = (K_{sp}/6912)^{1/7}$

(D) $S = \{K_{sp}/6912\}^7$

60. The solubility product of $AgCl$ is 1.8×10^{-10}.Precipitation of $AgCl$ will occur by mixing which of the following solutions when mixed in equal volume ?

(A) $10^{-8}\,M\,Ag^{+}$ and $10^{-8}\,M\,Cl^{-}\,ions$

(B) $10^{-3}\,M\,Ag^{+}$ and $10^{-3}\,M\,Cl^{-}\,ions$

(C) $10^{-6}\,M\,Ag^{+}$ and $10^{-6}\,M\,Cl^{-}\,ions$

(D) $10^{-10}\,M\,Ag^{+}$ and $10^{-10}\,M\,Cl^{-}\,ions$

61. Solid $Ba(NO_3)_2$ is gradually dissolved in $1.0 \times 10^{-4}\,M\,Na_2CO_3$ solution. At which concentration of Ba^{2+} the precipition will begin? ($K_{sp}\;BaCO_3 = 5.1 \times 10^{-9}$)

(A) $4.1 \times 10^{-5}\,M$ (B) $5.1 \times 10^{-5}\,M$ (C) $8.1 \times 10^{-8}\,M$ (D) $8.1 \times 10^{-7}\,M$

62. The expression for solubility product of mercurous iodide (Hg_2I_2) is

(A) $[2Hg^{+}]^2[I^{-}]^2$ (B) $[Hg^{+}]^2[I^{-}]^2$ (C) $[Hg^{+2}]^2[I^{-}]^2$ (D) $[Hg_2^{+2}][I^{-}]^2$

63. Calculate the minimum concentration of sulphate ion required to precipitate $BaSO_4$ in solution containing $10^{-4}\,mol/L$ of Ba^{+2} . $(K_{sp}\,BaSO_4 = 4 \times 10^{-10})$

(A) 4×10^{-6} (B) 4×10^{-10} (C) 2×10^{-6} (D) 2×10^{-10}

64. What is the molar solubility of $Fe(OH)_2$ $(K_{sp} = 8.0 \times 10^{-16})$ at pH 13.0 ?

(A) 8.0×10^{-18} (B) 8.0×10^{-15} (C) 8.0×10^{-17} (D) 8.0×10^{-14}

65. What is the molarity of F^{-} in a saturated solution of InF_3 ? $(K_{sp} = 7.9 \times 10^{-10})$

(A) 2.3×10^{-3} (B) 8.3×10^{-3} (C) 1.0×10^{-3} (D) 7.0×10^{-3}

66. The required amount of KBr (molar mass $= 119$) in gram to start the precipitation of $AgBr$ in $500\,mL$ solution of $0.05\,M\,AgNO_3$ will be $(K_{SP}$ of $AgBr = 5 \times 10^{-13}$)

(A) $1.19 \times 10^{-9}\,g$ (B) $4 \times 10^{-11}\,g$ (C) $5.95 \times 10^{-10}\,g$ (D) $2.97 \times 10^{-10}\,g$

67. Which of the following sets of concentrations will cause the precipitation of $ZnCl_2\,(K_{sp} = 1.2 \times 10^{-12} M^3)$?

(A) $[Zn^{2+}] = 10^{-8}\,M; [Cl^{-}] = 10^{-8}\,M$ (B) $[Zn^{2+}] = 10^{-5}\,M; [Cl^{-}] = 10^{-4}\,M$

(C) $[Zn^{2+}] = 10^{-6}\,M; [Cl^{-}] = 10^{-5}\,M$ (D) $[Zn^{2+}] = 10^{-5}\,M; [Cl^{-}] = 10^{-3}\,M$

68. The solubility product of lead bromide is 8×10^{-5}. If the salt is 80% dissociated in saturated solution, find the solubility of the salt

(A) $1.7 \times 10^{-4}\,M$ (B) $2.3 \times 10^{-6}\,M$ (C) $1.8 \times 10^{-4}\,M$ (D) $3.4 \times 10^{-2}\,M$

69. $150\,mL$ of $0.0008\,M$ ammonium sulphate is mixed with $50\,mL$ of $0.04\,M$ calcium nitrate. The ionic product of $CaSO_4$ will be $(K_{SP} = 2.4 \times 10^{-5}$ for $CaSO_4)$

(A) $< K_{SP}$ (B) $> K_{SP}$ (C) $\approx K_{SP}$ (D) None of these

70. The solubility product of $Mg(OH_2)$ is 1×10^{-12}. At what pH precipitation will occur in $0.01\,M\ MgCl_2$ solution?

(A) 8 (B) 9 (C) 10 (D) 12

71. The solubility product of AB_2 is $8 \times 10^{-5}\,M^3$. If the salt is $80\,\%$ dissociated in saturated solution, find the solubility of the salt.

Given [Molar mass $(AB_2) = 360$]

(A) 0.050 (B) 0.065 (C) 0.034 (D) 0.074

72. The molar solubility of PbI_2 in $0.2\,M\ Pb(NO_3)_2$ solution in terms of solubility product of PbI_2 is

(A) $\sqrt{(K_{sp}/0.2)}$ (B) $\sqrt{K_{sp}/0.4}$ (C) $\sqrt[3]{K_{sp}/0.8}$ (D) $\sqrt{K_{sp}/0.8}$

73. The required amount of KBr (molar mass $= 119$) in gram to start the precipitation of $AgBr$ in $500\,mL$ solution of $0.05\,M\ AgNO_3$ will be :- (K_{SP} of $AgBr = 5 \times 10^{-13}$)

(A) $1.19 \times 10^{-9}\,g$ (B) $4 \times 10^{-11}\,g$ (C) $5.95 \times 10^{-10}\,g$ (D) $2.97 \times 10^{-10}\,g$

74. In an aqueous solution SCN^{-1},B^{-1},I^{-1} and Cl^{-} are present. Which will get precipitated first, when $AgNO_3$ is mixed with each of them? Given that

Ksp of $AgCl = 1.2 \times 10^{-10}$,

Ksp of $AgI = 1.7 \times 10^{-16}$

Ksp of $AgSCN = 7.1 \times 10^{-7}$,

Ksp of $AgBr = 3.5 \times 10^{-13}$

(A) I^{-} (B) Cl^{-} (C) Br^{-} (D) SCN^{-}

75. Solubility of $AgCl$ in $0.2\,M\ NaCl$ is x and that in $0.1\,M\ AgNO_3$ is y then which of the following is correct ?

(A) $x = y$ (B) $x > y$

(C) $x < y$ (D) we can not predict

76. Solubility of an MX_2 type electrolyte is $0.5 \times 10^{-4}\,mol/litre$, then K_{sp} of electrolyte is

(A) 5×10^{-12} (B) 2.5×10^{-10} (C) 1×10^{-13} (D) 5×10^{-13}

77. What is the pH of a saturated solution of $Cu(OH)_2$? ($K_{sp} = 4.0 \times 10^{-6}$)

(A) 6.1 (B) 12.3 (C) 8.42 (D) 11.8

78. What will be the solubility of $AlCl_3$ in solution of $CaCl_2$ with concentration C

(A) $\frac{K_{sp}}{2C}$ (B) $\frac{K_{sp}}{8C^3}$ (C) $\frac{K_{sp}}{3C}$ (D) $\frac{K_{sp}}{4C^2}$

79. What is the molar solubility of Ag_2CO_3 $(K_{sp} = 4 \times 10^{-13})$ in $0.1\,M\ Na_2CO_3$ solution ?

(A) 10^{-6} (B) 10^{-7} (C) 2×10^{-6} (D) 2×10^{-7}

80. On passing H_2S gas through a highly acidic solution containing Cd^{2+} ions, CdS is not precipitated because

(A) Of common ion effect

(B) The solubility of CdS is low

(C) Cd^{2+}ions do not form complex with H_2S

(D) The solubility product of CdS is low

81. When NH_4Cl is added to NH_4OH solution, the dissociation of ammonium hydroxide is reduced. It is due to

(A) Common ion effect
(B) Hydrolysis
(C) Oxidation
(D) Reduction

82. In the reaction: $H_2S \rightleftharpoons 2H^+ + S^{2-}$, when NH_4OH is added, then

(A) S^{2-} is precipitate

(B) No action takes places

(C) Concentration of S^{2-} decreases

(D) Concentration of S^{2-} increases

83. Addition of conc. HCl to saturated $BaCl_2$ solution precipitates $BaCl_2$; because

(A) It follows from Le Chatelier's principle

(B) Of common-ion effect

(C) Ionic product (Ba^{++}),(Cl^-)remains constant in a saturated solution

(D) At constant temperature, the product (Ba^{2+}), $(Cl^-)^2$ remains constant in a saturated solution

84. The solubility of $AgCl$ is minimum in

(A) $AgNO_3\,(0.1\,M)$ (B) $H_2O\,(l)$ (C) $NaCl\,(0.4\,M)$ (D) $BaCl_2\,(0.3\,M)$

85. The pH of a simple sodium acetate buffer is given by $pH = pK_a + \log \frac{[Salt]}{[Acid]}$ K_a of acetic acid $= 1.8 \times 10^{-5}$ If [Salt] = [Acid] = $0.1\,M$, the pH of the solution would be about

(A) 7 (B) 4.7 (C) 5.3 (D) 1.4

86. ......m sodium acetate should be added to a 0.1 m solution of CH_3COOH to give a solution of $pH = 5.5\,(pK_a$ of $CH_3COOH = 4.5)$

(A) 0.1 (B) 0.2 (C) 1 (D) 10

87. Which of the following is a buffer

(A) $NaOH + CH_3COONa$
(B) $NaOH + Na_2SO_4$
(C) $K_2SO_4 + H_2SO_4$
(D) $NH_4OH + CH_3COONH_4$

88. When a buffer solution of sodium acetate and acetic acid is diluted with water

(A) Acetate ion concentration increases

(B) H^+ion concentration increases

(C) OH^-ion concentration increases

(D) H^+ion concentration remain unaltered

89. Which of the following solutions cannot act as a buffer

(A) $NaH_2PO_4 + H_3PO_4$ (B) $CH_3COOH + CH_3COONa$

(C) $HCl + NH_4Cl$ (D) $H_3PO_4 + Na_2HPO_4$

90. A solution which is resistant to change of pH upon the addition of an acid or a base is known as

(A) A colloid (B) A crystalloid (C) A buffer (D) An indicator

91. A certain buffer solution contains equal concentration of X^- and HX. The K_a for HX is 10^{-8}. The pH of the buffer is

(A) 3 (B) 8 (C) 11 (D) 14

92. The pK_a of equimolecular sodium acetate and acetic acid mixture is 4.74. If pH is

(A) 7 (B) 9.2 (C) 4.74 (D) 14

93. The condition for minimum change in pH for a buffer solution is

(A) Isoelectronic species are added

(B) Conjugate acid or base is added

(C) $pH = pK_a$

(D) None of these

94. The ionization constant of a certain weak acid is 4. What should be the [salt] to [acid] ratio if we have to prepare a buffer with $pH = 5$ using this acid and one of the salts

(A) $1:10$ (B) $10:1$ (C) $5:4$ (D) $4:5$

95. $50\ ml$ of $2\,N$ acetic acid mixed with $10\,ml$ of $1\ N$ sodium acetate solution will have an approximate pH of

(A) 4 (B) 5 (C) 6 (D) 7

96. Which of the following will not function as a buffer solution

(A) $NaCl$ and $NaOH$ (B) $NaOH$ and NH_4OH

(C) CH_3COONH_4 and HCl (D) All of above

97. pH of $0.1\,M$ solution of a weak acid (HA) is 4.50. It is neutralised with $NaOH$ solution to decrease the acid content to half pH of the resulting solution

(A) 4.50 (B) 8 (C) 7 (D) 10

98. If $50\,ml$ of $0.2\,M\ KOH$ is added to $40\,ml$ of $0.5\,M\ HCOOH$, the pH of the resulting solution is $(K_a = 1.8 \times 10^{-4})$

(A) 3.4 (B) 7.5 (C) 5.6 (D) 3.75

99. The pH of a buffer solution containg 0.2 mole per litre CH_3COONa and 1.5 mole per litre CH_3COOH is (Ka for acetic acid is 1.8×10^{-5})

(A) 4.87 (B) 5.8 (C) 2.4 (D) 9.2

100. For preparing a buffer solution of $pH\,5$ by mixing sodium acetate and acetic acid, the ratio of the concentration of salt and acid should be $(K_a = 10^{-5})$:-

(A) $1:10$ (B) $1:1$ (C) $10:1$ (D) $1:100$

101. What is the pH of solution obtained by mixing $5.076\,gm$ of methyl ammonium nitrate $(CH_3NH_3NO_3)$ to $120\,ml$, $0.225\,M$ methylamine $(CH_3NH_2$; K_b = $4 \times 10^{-4})$.

(A) 3.7 (B) 4.3 (C) 10.3 (D) 11

102. A buffer that is a mixture of acetic acid $(K_a = 2 \times 10^{-5})$ and potassium acetate has $pH = 5.18$. The $\frac{[CH_3COO^-]}{[CH_3COOH]}$ ratio in this buffer is approx

(A) $1:1$ (B) $3:1$ (C) $5:1$ (D) $1:3$

103. Which buffer is present in human blood :-

(A) $NaH_2PO_4 + Na_2HPO_4$ (B) $H_3PO_4 + NaH_2PO_4$

(C) $CH_3COOH + CH_3COONa$ (D) $H_2CO_3 + HCO_3^-$

104. Which of the following is a buffer solution ?

(A) $500\,mL$ of $0.1\,N\,CH_3COOH + 500\,mL$ of $0.1\,N\,NaOH$

(B) $500\,mL$ of $0.1\,N\,CH_3COOH + 1000\,ml$ of $0.1\,N\,NaOH$

(C) $500\,ml$ of $0.1\,N\,CH_3COOH + 500\,mL$ of $0.2\,N\,NaOH$

(D) $500\,mL$ of $0.2\,N\,CH_3COOH + 500\,ml$ of $0.1\,N\,NaOH$

105. The pK_a of weak acid (HA) is 4.5 . The pOH of an aqueous buffered solution of HA in which 50% of the acid is neutralised in its titration with strong base (BOH) is

(A) 7 (B) 4.5 (C) 2.5 (D) 9.5

106. Calculate pH of solution obtained by mixing $50\ ml$ $0.2\ M$ NH_4Cl solution and $75\,ml$. $0.1\ M\ NaOH$ solution. pKb for aqueous NH_3 is 4.74

(A) 4.26 (B) 5.22 (C) 8.78 (D) 9.74

107. In which of the following combinations, is buffer action expected

1. $NH_3 + NH_4Cl$
2. $HCl + NaCl$
3. $NH_3 + HCl$ in $2:1$ $mole$ ratio

Select the correct answer using the code given below

(A) 1 and 2 (B) 1 and 3 (C) 2 and 3 (D) $1,2$ and 3

108. The pK_a of weak acid HA is 4.5. The pOH of an aqueous buffered solution of HA in which 50% of the HA acid is ionised is

(A) 4.5 (B) 2.5 (C) 9.5 (D) 7

109. $20\,ml$ solution contains $0.1\,M, NH_4Cl$ and $0.01\,M\ NH_4OH$. By adding which one its pH will not change ?

(A) Addition of $1\,ml$ water

(B) Addition of $5\,ml$, $0.1\,M\ NH_4Cl$

(C) Addition of $5\,ml$, $0.1\,M\ NH_4OH$

(D) Addition of $10\,ml$, $0.1\,M\ NH_4Cl$

110. Which of the following mixture of solution can function as a buffer solution ?

(A) $50\,ml$ of $0.1\,M\ CH_3COOH + 50\,ml$ of $0.1\,M\ NaOH$

(B) $50\,ml$ of $0.2\,M\ HCl + 50\,ml$ of $0.2\,M\ NaOH$

(C) $50\,ml$ of $0.2\,M\ NH_3 + 50\,ml$ of $0.2\,M\ HCl$

(D) $50\,ml$ of $0.2\,M\ NH_3 + 50\,ml$ of $0.1\,M\ HCl$

111. The pH of an acidic buffer mixture is

(A) > 7 (B) < 7

(C) $= 7$ (D) Depends upon K_a of acid

112. In which of the following combination, is buffer action expected?

$(A)\ NH_4OH + NH_4Cl$ $(B)\ HCl + NaCl$

$(C)\ NH_4OH + HCl$ in $2:1\,mole$ ratio

Select the correct answer using the code given below

(A) A and B (B) A and C (C) A, B and C (D) None of these

113. If $20\,mL$ of $0.1\,M\ NaOH$ is added to $30\,mL$ of $0.2\,M\ CH_3COOH$ $(pK_a = 4.74)$, the pH of the resulting solution is

(A) 4.44 (B) 9.56 (C) 8.96 (D) 9.26

114. Which of the following is a buffer solution?

(A) $100\,ml\ 0.1\,M\ CH_3COOH + 100\,ml, 0.05\,M NaOH$

(B) $200\,ml\ 0.1\,M\ NH_4OH + 200\,ml, 0.08\,M HCl$

(C) $300\,ml\ 0.1\,M\ NaOH + 500\,ml, 0.1\,M C_6H_5COOH$

(D) All of these

115. 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

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

116. Which is a buffer solution

(A) $CH_3COOH + CH_3COONa$ (B) $CH_3COOH + CH_3COONH_4$

(C) $CH_3COOH + NH_4Cl$ (D) $NaOH + NaCl$

117. Phenolphthalein does not act as an indicator for the titration between

(A) $NaOH$ and CH_3COOH

(B) $H_2C_2O_4$ and $KMnO_4$

(C) $Ba(OH)_2$ and HCl

(D) KOH and H_2SO_4

118. If very small amount of HPh (phenolphthalein) added to $0.1\,M$ aqueous solution of CH_3COONa. The fraction of indicator that exists in colourless form is Given $[K_b\,(CH_3COO^-) = 10^{-9}, pK_a\,(HPh) = 9.6, log\,2 = 0.3]$

(A) 0.2 (B) 0.8 (C) 0.5 (D) 0.4

119. A $20\,ml$ sample of a $0.1\,M$ solution of the weak monoprotic acid HA is titrated with $0.25\,M\,NaOH$, volume of $NaOH$ solution required till equivalent point is :- .... mL

(A) 10 (B) 6 (C) 12 (D) 8

120. CrO_4^{-2} (Yellow) changes to $Cr_2O_7^{-2}$ (orange) in $pH = x$ and vice verses in $pH = y$, hence x and y are respectively

(A) $6,5$ (B) $8,6$ (C) $6,8$ (D) $7,7$

121. The solubility product of CuS, Ag_2S, HgS are 10^{-31}, 10^{-44}, 10^{-54} respectively. The solubilities of these sulphides are in the order

(A) $Ag_2S > CuS > HgS$ (B) $Ag_2S > HgS > Cus$

(C) $HgS > Ag_2S > Cus$ (D) $CuS > Ag_2S > HgS$

122. Boron halides behave as Lewis acids, because of their

(A) Ionic nature (B) Acidic nature

(C) Covalent nature (D) Electron deficient nature

123. pH value of $N/10\ NaOH$ solution is

(A) 10 (B) 11 (C) 12 (D) 13

124. The pH of blood does not appreciably change by a small addition of an acid or a base because blood

(A) Contains serum protein which acts as buffer

(B) Contains iron as a part of the molecule

(C) Can be easily coagulated

(D) It is body fluid

125. Consider the following reaction involving two acids shown below : formic acid and.HF.

Which of the following statements about this reaction are true ?

(A) Formic acid is the strongest Bronsted acid in the reaction

(B) HF is the strongest Bronsted acid in the reaction

(C) KF is the strongest Bronsted base in the reaction

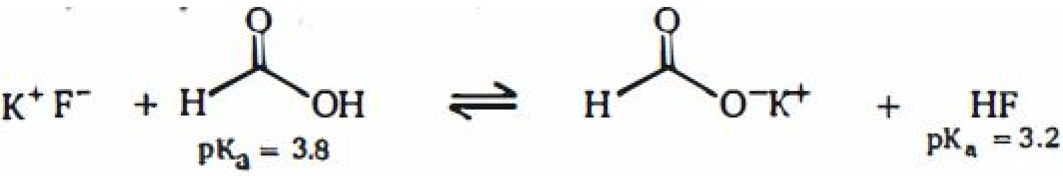
(D) KO_2CH is the strongest Bronsted base in the reaction

(E) The equilibrium favours the reactants

(F) The equilibrium favours the products

(G) Formic acid has a weaker conjugate base

(H) HF has a weaker conjugate base



(A) A, D and F

(B) $B, D,$ and H

(C) $A, C,$ and H

(D) B, D, E and H

----- "काक चेष्टा बको ध्यानं, श्वान निद्रा तथैव च। अल्पाहारी गृहत्यागी, विद्यार्थी पंच लक्षणं।" -- कौवे की तरह प्रयास, बगुले की तरह ध्यान, कुत्ते की तरह नींद, कम भोजन, और घर त्याग, ये विद्यार्थियों के पांच लक्षण हैं। -----