

SINGLE CORRECT OPTION TYPE

- A_2B_3 ; a sparingly soluble salt of molar mass $Mg \text{ mol}^{-1}$ has solubility $s \text{ litre}^{-1}$. What is the ratio of $[B^{2-}]$ to the solubility product of the salt?

(A) $\frac{M^4}{54s^4}$ (B) $\frac{M^4}{36s^4}$ (C) $\frac{M^5}{108s^5}$ (D) $\frac{108s^5}{Ms}$
- Ag_2CrO_4 and $Ag_2C_2O_4$ both are present in a saturated solution in water. K_{sp} of Ag_2CrO_4 and $Ag_2C_2O_4$ are 2×10^{-12} and 2×10^{-11} respectively, what is $[Ag^+]$ in solution?

(A) 3.53×10^{-4} (B) 3.53×10^{-2} (C) 3.53×10^{-5} (D) 3.53×10^{-3}
- A buffer solution of lowest pH is obtained by mixing equimolar amount of

(A) $HCOOH + HCOONa$ (B) $CH_3COOH + CH_3COONa$
(C) $HCN + NaCN$ (D) $NaHCO_3 + H_2CO_3$
- Three aqueous solution A, B and C are prepared by adding NaCl, NaOH and HCl respectively. The ionic product of water will

(A) increase in A, decrease in B and C (B) increase in B, decrease in A and C
(C) increase in C, decrease in A and B (D) remains same in all the three
- The pH of the solution at the neutralisation point of 0.1 M NH_4OH with 0.1 N HCl would be

(A) 10 (B) 6 (C) 7 (D) 9
- pH of 0.01 mol dm^{-3} CH_3COOH ($k_a = 1.74 \times 10^{-5}$):

(A) 3.4 (B) 3.6 (C) 3.9 (D) 3.0
- K_a for CH_3COOH is 1.8×10^{-5} and K_b for NH_4OH is 1.8×10^{-5} . The pH of ammonium acetate will be

(A) 7.005 (B) 4.75 (C) 7.0 (D) between 6 and 7
- The K_a values of acetic acid hypochlorous acid and formic acid are 1.74×10^{-5} , 3.0×10^{-8} and 1.8×10^{-4} respectively. Which of the following orders of pH of 0.1 mol dm^{-3} solutions of these acids is correct?

(A) Acetic acid > Hypochlorous acid > Formic acid
(B) Hypochlorous acid > Acetic acid > Formic acid
(C) Formic acid > Hypochlorous acid > Formic acid
(D) Formic acid > Acetic acid > hypochlorous acid
- K_{a1} , K_{a2} and K_{a3} are the respective dissociation for the following reactions:

$$H_2S \rightleftharpoons H^+ + HS^-$$

$$HS^- \rightleftharpoons H^+ + S^{2-}$$

$$H_2S \rightleftharpoons 2H^+ + S^{2-}$$

The correct relationship between K_{a1} and K_{a2} and K_{a3} is

(A) $K_{a3} = K_{a1} \times K_{a2}$ (B) $K_{a3} = K_{a1} + K_{a2}$ (C) $K_{a3} = K_{a1} - K_{a2}$ (D) $K_{a3} = \frac{K_{a1}}{K_{a2}}$
- The conjugate base of $H_2PO_4^-$ is _____.

(A) HPO_4^{2-} (B) P_2O_5 (C) H_2PO_4 (D) PO_4^{3-}

11. The solubility of A_2X_3 is $y \text{ mol dm}^{-3}$. Its solubility product is
 (A) $6y^4$ (B) $64y^4$ (C) $36y^5$ (D) $108y^5$
12. Given, $HF + H_2O \xrightarrow{K_a} H_3O^+ + F^-$
 $F^- + H_2O \xrightarrow{K_b} HF + OH^-$
 Which relation is correct?
 (A) $K_b = K_w$ (B) $K_b = \frac{1}{K_w}$ (C) $K_a \times K_b = K_w$ (D) $\frac{K_a}{K_b} = K_w$
13. The solubility of AgI in NaI solution is less than that in pure water because
 (A) AgI forms complex with NaI
 (B) Le Chatelier's principle
 (C) solubility product of AgI is less than that of NaI
 (D) the temperature of the solution decreases
14. Which can act as buffer?
 (A) $NH_4Cl + NH_4OH$ (B) $CH_3COOH + CH_3COONa$
 (C) 40 mL of 0.1 M NaCN + 20 mL of 0.1 M HCl (D) all of the above
15. The molar solubility (in mol L^{-1}) of a sparingly soluble salt Mx_4 is 's'. The corresponding solubility product is K_{sp} . s is given in terms of K_{sp} by the relation:
 (A) $S = \left[\frac{K_{sp}}{256} \right]^{1/5}$ (B) $S = [128K_{sp}]^{1/4}$ (C) $S = [256K_{sp}]^{1/5}$ (D) $S = \left[\frac{K_{sp}}{128} \right]^{1/4}$
16. For a sparingly soluble salt $A_p B_q$, the relationship of its solubility product (L_s) with its solubility (s) is:
 (A) $L_s = s^{p+q} \cdot p^p \cdot q^q$ (B) $L_s = s^{p+q} \cdot p^q \cdot q^p$ (C) $L_s = s^{pq} \cdot p^p \cdot q^q$ (D) $L_s = s^{pq} \cdot (pq)^{p+q}$
17. A solution which is 10^{-3} M each in Mn^{2+} , Fe^{2+} , Zn^{2+} and Hg^{2+} is treated with 10^{-16} M sulphide ion. If K_{sp} of MnS, FeS, ZnS and HgS are 10^{-13} , 10^{-18} , 10^{-24} and 10^{-53} respectively, which one will precipitate first?
 (A) FeS (B) MgS (C) HgS (D) ZnS
18. An aqueous solution of 0.1 M NH_4Cl will have a pH closer to
 (A) 9.1 (B) 8.1 (C) 7.1 (D) 5.1
19. Arrange the following in increasing order of pH:
 1. 0.1 M $CH_3COONa + 0.1 M CH_3COOH$ 2. 0.1 M $CH_3COOH + 0.1 M HCl$
 3. 0.1 M CH_3COOH 4. 0.1 M HCl
 (A) $4 < 2 < 3 < 1$ (B) $1 < 2 < 3 < 4$ (C) $2 < 3 < 4 < 1$ (D) $4 < 3 < 2 < 1$
20. P^{OH} of 0.003 M HCl is
 (A) $11 + \log 3$ (B) $11 - \log 3$ (C) $7 + \log 3$ (D) $7 - \log 3$

INTEGER TYPE

21. K_{sp} of $M(OH)_2$ is 5×10^{-16} at 25°C . The pH of its saturated solution at 25°C is _____.
22. A certain buffer solution equals concentration of x^- and Hx . K_b for x^- is 10^{-10} . The pH of buffer is _____.

23. K_{sp} of SrF_2 is $1 \times 10^{-10} M^3$. The solubility of SrF_2 in 0.1 M NaF is $1 \times 10^{-a} M$. The value of a is _____.
24. The sum of basicities of H_3PO_4 , H_3PO_2 and H_3PO_3 is _____.
25. pH of 0.1 M weak monoprotic acid solution having degree of dissociation 0.01 is _____.

KEY

1. B	2. A	3. A	4. D	5. B
6. A	7. C	8. B	9. A	10. A
11. D	12. C	13. B	14. D	15. A
16. A	17. C	18. D	19. B	20. A
21. 9	22. 9	23. 8	24. 6	25. 3

** Wish You^{est} all the Best **