NEET : CHAPTER WISE TEST-7

SUBJECT :- CHEMISTRY **DATE.....**
CLASS :- 11th **NAME.....**
CHAPTER :- IONIC EQUILIBRIUM **SECTION.....**

(SECTION-A)

1. According to Bronsted and Lowrry concept, water is a/an:
(A) Base (B) Acid
(C) Amphoteric (D) Salt

2. Which of the following salts of H_3PO_3 exist(s) ?
(I) NaH_2PO_3 (II) Na_2HPO_3
(III) Na_3PO_3
(A) I and II only (B) I, II and IIII
(C) II and III only (D) III only

3. An acid with molelcular formula $C_7H_6O_3$ forms three types of sodium salts. i.e., $C_7H_5O_3Na$, $C_7H_4O_3Na_2$ and $C_7H_3O_3Na_3$. The basicity of the acid is:
(A) One (B) Two
(C) Three (D) Four

4. The following equilibrium is established when $HClO_4$ is dissolved in weak acid HF.
$HF + HClO_4 \rightleftharpoons ClO_4^- + H_2F^+$
Which of the following is correct set of conjugate acid base pair ?
(A) HF and $HClO_4$ (B) HF and ClO_4^-
(C) HF and H_2F^+ (D) $HClO_4$ & H_2F^+

5. Boric acid H_3BO_3 is a :
(A) Arrhenius acid (B) Bronsted acid
(C) Lewis acid (D) All of these

6. Which of the following can act both as Bronsted acid and Bronsted base ?
(A) Cl^- (B) HCO_3^-
(C) H_3O^+ (D) OH^-

7. The degree of dissociation in a weak electrolyte increases :
(A) On increasing dilution
(B) On increasing pressure
(C) On decreasing dilution
(D) None of these

8. Ostwald's dilution law gives satisfactory results with the solution of which electrolyte ?
(A) HCl (B) HNO_3
(C) CH_3COOH (D) NaOH

9. pH of human blood is 7.4. Then H^+ concentration will be:
(A) 4×10^{-8} (B) 2×10^{-8}
(C) 4×10^{-4} (D) 2×10^{-4}

10. pH of pure water is 7 at 298K. If the solution is heated to 320K, which of the following statement is true?
(A) pH will decrease
(B) pOH will increase
(C) pH will increase
(D) pH will decrease and pOH will increase

11. The values of dissociation constants of some acids (at 25°C) are as follows. Indicate which is the strongest acid in water ?
(A) 1.4×10^{-2} (B) 1.6×10^{-4}
(C) 4.4×10^{-10} (D) 4.3×10^{-7}

12. Select the correct statement :
(A) If $[H^+] = y \times 10^{-x}$ M then pH = x – log y
(B) If $[H^+] = \frac{1}{y} \times 10^{-x}$ M then pH = x + log y
(C) At 25°C, pH of a solution = 14 + log $[OH^-]$
(D) All of the above

13. The pH of solution obtained by mixing 500 ml of 0.15 M H_2SO_4 with 500 ml of 0.1 M NaOH is :
(A) 0 (B) 1 (C) 2 (D) 7

14. Given pH of a solution A is 3 and it is mixed with another solution B having pH 2 keeping the volume same. If both are mixed, then resultant pH of the solution will be :
(A) 3.2 (B) 2.26
(C) 3.4 (D) 3.5

15. On adding 0.04 g solid NaOH to a 100 mL, $\frac{M}{200}$ $Ba(OH)_2$ solution, determine change in pH :
(A) 0 (B) +0.3
(C) –0.3 (D) +0.7

16. The pH value of 1.0×10^{-8} M HCl solution is less than 8 because
(A) HCl is completely ionised at this concentration
(B) The ionization of water is negligible
(C) The ionization of water cannot be assumed negligible in comparison with this low concentration of HCl
(D) The pH cannot be calculated at such a low concentration of HCl

17. Pure water is kept in a vessel and it remains exposed to atmospheric CO_2 which is absorbed. Then its pH will be :
(A) Greater than 7
(B) Less than 7
(C) 7
(D) Depends on ionic product of water

18. Find the percentage ionisation of 0.2 M acetic acid solution, whose dissociation constant is 1.8×10^{-5}
(A) 0.198 (B) 0.290
(C) 0.950 (D) None of these

19. 0.02 M monobasic acid dissociates 2%. Hence, pH of the solution is :
(A) 0.3979 (B) 1.3979
(C) 1.699 (D) 3.3979

20. Concentration of CH_3COO^- is 0.001 M, when 0.1 moles of CH_3COOH were dissolved in 1L water. K_a of CH_3COOH is :
(A) 2×10^{-5} (B) 10^{-5}
(C) 10^{-6} (D) 2×10^{-4}

21. For two weak acis A and B, the ratio of their percent ionization is 4 : 9. The ratio of their K_a would be :
(A) 4 : 9 (B) 2 : 3
(C) 16 : 81 (D) 3 : 2

22. The ionisation constant of a tribasic acid is K_a. If its first , second and third ionisation constant are K_{a_1}, K_{a_2} and K_{a_3} respectively then :
(A) $K_a = K_{a_1} \times K_{a_2} \times K_{a_3}$
(B) $K_a = \frac{K_{a_1}}{K_{a_2} \times K_{a_3}}$
(C) $K_{a_2} = \frac{K_{a_1} \times K_a}{K_{a_3}}$
(D) None of these

23. What will be the pH of a 0.01 M H_3PO_4 solution having $[PO_4^{3-}] = 10^{-5}$ M ? $\left[K_{a_1} = 10^{-4}, K_{a_2} = 10^{-6}, K_{a_3} = 10^{-8}\right]$
(A) 3 (B) 4 (C) 5 (D) 6

24. The reverse process of neutralisation is :
(A) Hydrolysis
(B) Decomposition
(C) Dehydration
(D) Synthesis

25. Which of the following salts undergo anionic hydrolysis ?
(A) Na_3PO_4 (B) NaCl
(C) NH_4Cl (D) $FeSO_4$

26. The aqueous solution of which of the following salt has the lowest pH ?
(A) NaClO (B) $NaClO_2$
(C) $NaClO_3$ (D) $NaClO_4$

27. Select the correct combination :
(A) The aqueous solution of each Na_3BO_3 and Na_3PO_4 – Acidic nature
(B) The aqueous solution of each Na_3BO_3 and CH_3COONa – basic nature
(C) The aqueous solutions of each CH_3COONa and NaCN – acidic nature
(D) The aqueous solutions of each Na_3PO_4 and NH_4Cl – acidic nature

28. What is the pH of an aqueous solution of ammonium acetate ($K_a = K_b = 1.8 \times 10^{-5}$) ?
(A) > 7 (B) 7.0
(C) < 7.0 (D) Zero

29. If $pK_b > pK_a$ then the solution of the salt of weak acid and weak base will be –
(A) Neutral (B) Acidic
(C) Basic (D) Amphoteric

30. The hydrolysis constant of 0.5 M ammonium benzoate is 6.25×10^{-6}. The percentage hydrolysis of the salt is :
(A) 0.25 (B) 0.177
(C) 0.125 (D) 0.50

31. The pH of 0.01 M sodium acetate solution is : $[K_a(CH_3COOH)] = 2 \times 10^{-5}$
(A) 7.25 (B) 6.5
(C) 8.05 (D) 8.35

32. Addition of sodium acetate solution to acetic acid cause the following change
(A) pH increases
(B) pH decreases
(C) pH remains unchanged
(D) pH becomes 7

33. Buffer solutions have constant acidity and alkalinity because :
(A) these give unionised acid or base on reaction with added acid or alkali.
(B) acids and alkalies in these solution are shielded from attack by other ions.
(C) they have large excess of H^+ or OH^- ions.
(D) they have fixed value of pH.

34. In which of the following respective volume ratios should 0.1 M NH_4OH solution & 0.1 M HCl solution be mixed, so that the resulting solution behaves like a buffer solution ?
(A) 1 : 1
(B) 2 : 1
(C) 1 : 2
(D) No such volume ratio is possible

35. A buffer solution is prepared by mixing 0.050 moles of a weak acid HA and 0.20 moles of NaA in sufficient amount of water to give 500 mL of solution (K_a for HA is 4.5×10^{-4}). The pH of this solution is :
(A) 1.97 (B) 2.17
(C) 2.74 (D) 3.95

(SECTION-B)

36. Which of the following does not act as a buffer solution ?
(A) Sodium acetate and acetic acid
(B) Boric acid and borax
(C) NH_4OH and NH_4Cl
(D) Sodium acetate and sodium hydroxide

37. The pH indicators are :
(A) Salts of strong acids and strong bases
(B) Salts of weak acids and weak bases
(C) Either weak acids or weak bases
(D) Either strong acids or strong bases

38. The pH range of methyl red indicator is :
(A) 4.2 to 6.3 (B) 8.3 to 10.0
(C) 8.0 to 9.6 (D) 6.8 to 8.4

39. 0.1 dm^3 of 0.1 M acetic acid is titrated against 0.1 M NaOH. When 50 cm^3 of 0.1 M NaOH are added, the pH of the solution will be : ($pK_a = 4.74$)
(A) 2.37 (B) 4.74

(C) 1.34 (D) 5.74

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 the solubility of calcium fluoride in pure water is x mol/L, Its solubility product is :

(A) $\sqrt{2}x$ (B) $2x^2$

(C) $4x^3$ (D) x^2

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. The aqueous solution of which of the following sulphides would contain maximum concentration of S^{2-} ions:

(A) MnS ($K_{sp} = 1.1 \times 10^{-21}$)

(B) ZnS ($K_{sp} = 1.1 \times 10^{-23}$)

(C) PbS ($K_{sp} = 1.1 \times 10^{-35}$)

(D) CuS ($K_{sp} = 1.1 \times 10^{-30}$)

44. The solubility product of Ag_2CrO_4 is 32×10^{-12} . What is the concentration of CrO_4^{2-} ions in that solution

(A) 2×10^{-4} M (B) 16×10^{-4} M

(C) 8×10^{-4} M (D) 8×10^{-8} M

45. The solubility of $BaSO_4$ in water is 2.33×10^{-3} g / litre. Its solubility product will be (molecular weight of $BaSO_4$ = 233)

(A) 1×10^{-5} (B) 1×10^{-10}

(C) 1×10^{-15} (D) 1×10^{-20}

46. Solubility of BaF_2 in a solution of $Ba(NO_3)_2$ will be represented by the concentration term:

(A) $[Ba^{2+}]$ (B) $[F^-]$

(C) $1/2[F^-]$ (D) $2[NO_3^-]$

47. K_{sp} of AgCl is 1×10^{-10}. Its solubility in 0.1 M KNO_3 will be :

(A) 10^{-5} moles/litre

(B) $> 10^{-5}$ moles/litre

(C) $< 10^{-5}$ moles/litre

(D) None of these

48. Solubility of AgCl will be minimum in :

(A) 0.001M $AgNO_3$ (B) Pure water

(C) 0.01 M $CaCl_2$ (D) 0.01 M NaCl

49. **Assertion :** A ionic product is used fro any types of electrolytes whereas solubility product is applicable only to sparingly soluble salts.

Reason : Ionic product is defined at any stage of the raction whereas solubility product is only appicable to the saturation stage.

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(C) If assertion is true but reason is false.

(D) If assertion is false but reason is true.

50. **Assertion :** $BaCO_3$ is more soluble in HNO_3 than in plain water.

Reason : Carbonate is a weak base and reacts with the H^+ from the strong acid, casuing the barium salt to dissociate.

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(C) If assertion is true but reason is false.

(D) If assertion is false but reason is true.