1 Mark Questions

1. The ground state electronic configuration of iron is $[Ar]\ 3d^6\ 4s^2$. The electronic configuration of ferric ion is

(a) $[Ar]\ 3d^6\ 4s^0$ (b) $[Ar]\ 3d^4\ 4s^2$
(c) $[Ar]\ 3d^5\ 4s^0$ (d) $[Ar]\ 3d^3\ 4s^2$

2. In fluorite structure, the coordination number of calcium is

(a) 3 (b) 4
(c) 6 (d) 8

3. Nickel forms a stable complex with cyanide ion having the composition $[Ni(CN)_4]^{2-}$. The atomic number of nickel is 28. The magnetic moment of the complex in Bohr magneton is

(a) 0 (b) 1.73
(c) 2.83 (d) 3.87

4. Among the following compounds the one that generates H_2O_2 on acidification is

(a) PbO_2 (b) MnO_2
(c) BaO_2 (d) SnO_2

5. The complex $[Co(NH_3)_5Cl]Cl_2$ reacts with an aqueous solution of silver nitrate quantitatively. The number of moles of silver chloride formed per mole of the complex is

(a) 1 (b) 2
(c) 3 (d) 5

6. Among the following the one that is not an amphoteric oxide is

(a) Al_2O_3 (b) MgO
(c) ZnO (d) SnO

7. The formula of peroxodisulphuric acid is

(a) H_2SO_5 (b) $H_2S_2O_3$
(c) $H_2S_2O_4$ (d) $H_2S_2O_8$

8. The oxidation states of sulphur atoms in $Na_2S_2O_3$ are

(a) +2, −6 (b) +2, +2
(c) +2, +6 (d) −2, +6

9. The pair that shows critical solution temperature in a composition-temperature phase diagram is

(a) phenol-water (b) phenol-benzene
(c) chloroform-water (d) methanol-water

10. The van't Hoff factor for a completely dissociated aqueous solution of $K_4[Fe(CN)_6]$ is

(a) 1 (b) 2
(c) 3 (d) 5

11. The solubility product of a sparingly soluble salt, AX_3 in water is 2.7×10^{-31} at 298 K. The solubility of the salt in mol / L is

(a) 5×10^{-16} (b) 1×10^{-13}
(c) 4×10^{-11} (d) 1×10^{-8}

12. If the standard reduction potential of Fe^{3+}/Fe^{2+} is 0.77 V, then the reduction potential of the electrode Pt/Fe^{3+} (0.1 M), Fe^{2+} (1.0 M) at 298 K is

(a) 0.67 V (b) 0.71 V
(c) 0.77 V (d) 0.83 V

13. Among the following statements the one that is not true for a zero order reaction is

(a) $t_{1/2}$ is directly proportional to the initial concentration of the reactant
(b) the time taken for 75% reaction is 1.5 times that of $t_{1/2}$
(c) the rate constant has the dimensions of concentration time^{-1}
(d) the concentration of the reactant decreases exponentially with time

14. For the gaseous equilibrium $PCl_5 \rightleftharpoons PCl_3 + Cl_2$, the degree of dissociation of PCl_5 is 0.80 at 1 atm. The degree of dissociation at 2 atm is

(a) 0.69 (b) 0.80
(c) 0.85 (d) 0.90

15. Among the following the one that is an extensive variable is
(a) density (b) volume
(c) specific heat (d) temperature

16. For an adiabatic irreversible expansion of one mole of an ideal gas
(a) ΔS (system) > 0 and ΔS (surroundings) $= 0$
(b) ΔS (system) $= 0$ and ΔS (surroundings) $= 0$
(c) ΔS (system) < 0 and ΔS (surroundings) > 0
(d) ΔS (system) > 0 and ΔS (surroundings) < 0

17. Among the following the correct statement is
(a) pH of water at 333 K is less than 7
(b) pH of 0.1 M NH_4Cl(aq) > 0.1 M NaCl(aq)
(c) pH of 0.1 M CH_3COOH(aq) < 0.1M HCl(aq)
(d) pH of 10^{-8} M HCl is 8

18. *Iso*-butyl alcohol is prepared from the reaction of
(a) CH_3CH_2MgBr and CH_3CHO
(b) CH_3MgBr and CH_3CH_2CHO
(c) $(CH_3)_2CHMgBr$ and HCHO
(d) CH_3MgBr and CH_3COCH_3

19. The major product obtained by the dehydration of 1-methylcyclohexanol is
(a) 1-methylcyclohexene
(b) 3-methylcyclohexene
(c) 4-methylcyclohexene
(d) methylenecyclohexane

20. Reaction of aniline with chloroform and KOH produces
(a) *ortho*-chloroaniline
(b) phenylisocyanide
(c) benzoic acid
(d) benzenediazonium chloride

21. The major product formed on bromination of acetanilide is
(a) *ortho*-bromoacetanilide
(b) *meta*-bromoacetanilide
(c) *para*-bromoacetanilide
(d) N-bromoacetanilide

22. Among the following the one that is aromatic is
(a) cyclohexadienyl cation
(b) cycloheptatrienyl cation
(c) cyclopentadienyl cation
(d) cyclopropyl cation

23. The number of stereoisomers possible for 2-bromo-3-chlorobutane is
(a) 1 (b) 2
(c) 3 (d) 4

24. The solid product formed by the reaction of ammonia with formaldehyde is
(a) ammonium formate
(b) formaldehyde imine
(c) hexamethylenetetramine
(d) formamide

25. Conversion of benzaldehyde to cinnamic acid is known as
(a) Perkin reaction
(b) Riemer-Tiemann reaction
(c) Cannizaro reaction
(d) Kolbe reaction