1. Density of a crystal remains unchanged as a result of
   (a) ionic defect (b) Schottky defect
   (c) Frenkel defect (d) crystal defect

2. The hydrocarbon which does not decolourise alkaline $KMnO_4$ solution and also does not give any precipitate with ammoniacal silver nitrate is
   (a) acetylene (b) benzene
   (c) propyne (d) butyne-1

3. Which of the following organic compounds exhibits positive Fehling test as well as iodoform test?
   (a) Methanal (b) Ethanol
   (c) Ethanal (d) Propanone

4. Oxidation of toluene to benzaldehyde by the use of chromyl chloride is called
   (a) Wurtz reaction
   (b) Etard's reaction
   (c) Fittig reaction
   (d) Rosenmund's reaction

5. The only alcohol that can be prepared by the direct hydration of alkene is
   (a) ethyl alcohol (b) methyl alcohol
   (c) propyl alcohol (d) *iso*-butyl alcohol

6. The fresh precipitate can be transformed in colloidal state by
   (a) peptisation (b) coagulation
   (c) diffusion (d) None of these

7. Which of the following has zero dipole moment?
   (a) ClF (b) PCl_3
   (c) SiF_4 (d) $CFCl_3$

8. The hybrid orbital used by chlorine atom in ClO_2^- ion is
   (a) sp^3
   (b) sp^2
   (c) sp
   (d) None of the above

9. The relationship between standard reduction potential of a cell and equilibrium constant is shown by

28. Which of the following compounds is square planar and does not have any unpaired electron?
(a) $Ni(CO)_4$ (b) $[Ni(H_2O)_6]^{2+}$
(c) $[NiCl_4]^{2-}$ (d) $[Ni(CN)_4]^{2-}$

29. White anhydrous copper sulphate decomposes to give
(a) $CuSO_4 \cdot 5H_2O$ (b) $CuSO_4 \cdot H_2O$
(c) $CuO + SO_3$ (d) Cu

30. If NaOH is added to an aqueous solution of zinc ions, a white precipitate appears and on adding excess of NaOH, the precipitate dissolves. In this solution zinc exist in the
(a) cationic part
(b) anionic part
(c) both in cationic and anionic part
(d) there is no zinc in the solution

31. Chlorine gas is dried over
(a) CaO (b) NaOH
(c) KOH (d) conc. H_2SO_4

32. Which of the following halogens does not form its oxyacids?
(a) Fluorine (b) Chlorine
(c) Bromine (d) Iodine

33. Which of the following hydrides has the lowest boiling point?
(a) H_2O (b) H_2S
(c) H_2Se (d) H_2Te

34. Glass is a
(a) polymeric mixture
(b) microcrystalline solid
(c) supercooled liquid
(d) gel

35. Thermite is a mixture of iron oxide and
(a) zinc powder (b) sodium shavings
(c) potassium metal (d) aluminium powder

36. The volume of water to be added to 100 cm^3 of 0.5 N H_2SO_4 to get decinormal concentration is
(a) 400 cm^3 (b) 500 cm^3
(c) 450 cm^3 (d) 100 cm^3

37. The rate of a first order reaction is 1.5×10^{-2} mol L^{-1} min^{-1} at 0.5 M concentration of the reactant. The half-life of the reaction is
(a) 7.53 min (b) 0.383 min
(c) 23.1 min (d) 8.73 min

38. The hydrolysis of ester in alkaline medium is a
(a) first order reaction with molecularity 1
(b) second order reaction with molecularity 2
(c) first order reaction with molecularity 2
(d) second order reaction with molecularity 1

39. Which is correct statement?
(a) Starch is a polymer of α-glucose
(b) Amylose is a component of cellulose
(c) Proteins are compounds of only one type of amino acid
(d) In cyclic structure of fructose, there are four carbons and one oxygen atom

40. Oleic, stearic and palmitic acids are
(a) nucleic acids (b) amino acids
(c) fatty acids (d) None of these

41. Arrange the following halides in the decreasing order of S_N1 reactivity.

$\underset{(I)}{CH_3CH_2CH_2Cl}$, $\underset{(II)}{CH_2{=}CHCH(Cl)CH_3}$,

$\underset{(III)}{CH_3CH_2CH(Cl)CH_3}$

(a) I > II > III (b) II > I > III
(c) II > III > I (d) III > II > I

42. Catalyst used in the dimerisation of acetylene to prepare chloroprene is
(a) $HgSO_4 + H_2SO_4$ (b) Cu_2Cl_2
(c) $Cu_2Cl_2 + NH_4Cl$ (d) $Cu_2Cl_2 + NH_4OH$

43. The phenomenon of radioactivity is associated with
(a) decay of nucleus
(b) fusion of nucleus
(c) emission of electrons or protons
(d) rearrangement in the extra nuclear electron

44. If Z is the number of atoms in the unit cell that represents the closest packing sequence – ABC, ABC –, the number of tetrahedral voids in the unit cell is equal to
(a) Z (b) $2Z$
(c) $\frac{Z}{2}$ (d) $\frac{Z}{4}$

45. Conjugate acid of SO_4^{2-} is
(a) HSO_4^- (b) HSO_4
(c) H_2SO_4 (d) SO_4^-

46. $AgCl + KI \rightleftharpoons KCl + AgI$
In the above reaction as KI is added, the equilibrium is shifted towards right giving more AgI precipitate, because

(a) both AgCl and AgI are sparingly soluble
(b) the K_{sp} of AgI is lower than K_{sp} of AgCl
(c) the K_{sp} of AgI is higher than K_{sp} of AgCl
(d) both AgCl and AgI have same solubility product

47. The pH of a solution of hydrochloric acid is 4. The molarity of this solution is
(a) 4.0 (b) 0.4
(c) 0.0001 (d) 0.04

48. Sulphanilic acid is
(a) Arrhenius acid
(b) Lewis base
(c) Neither (a) nor (b)
(d) Both (a) and (b)

49. For how many orbitals, the quantum numbers, $n = 3, l = 2, m = +2$ are possible?
(a) 1 (b) 2
(c) 3 (d) 4

50. The number of gram molecules of oxygen which are present in 6.022×10^{24} CO molecules is
(a) 10 g-molecule (b) 5 g-molecule
(c) 1 g-molecule (d) 0.5 g-molecule

51. The number of elements present in the fifth period of the Periodic Table is
(a) 8 (b) 10
(c) 18 (d) 32

52. Pyrolusite is
(a) an oxide ore (b) a sulphide ore
(c) a carbide ore (d) not an ore

53. The reaction,

$$H_2S + H_2O_2 \longrightarrow S + 2H_2O$$

indicates
(a) acidic nature of H_2O_2
(b) alkaline nature of H_2O_2
(c) oxidising action of H_2O_2
(d) reducing action of H_2O_2

54. One mole of a perfect gas expands isothermally to ten times of its original volume. The change in entropy is
(a) 0.1 R (b) 2.303 R
(c) 10.0 R (d) 100.0 R

55. For the reaction,

$$PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$$

the value of K_c at 250°C is 26. The value of K_p at this temperature will be
(a) 0.0006 (b) 0.46
(c) 0.57 (d) 0.83

Answer – Key

1. c	2. b	3. c	4. b	5. a	6. a	7. c	8. a	9. b	10. b
11. b	12. a	13. b	14. d	15. b	16. b	17. c	18. a	19. d	20. b
21. c	22. d	23. d	24. d	25. d	26. c	27. a	28. d	29. c	30. b
31. d	32. a	33. d	34. c	35. d	36. a	37. c	38. b	39. a	40. c
41. c	42. c	43. a	44. b	45. a	46. b	47. c	48. d	49. a	50. b
51. c	52. a	53. c	54. b	55. a					