1. Least volatile hydrogen halide is
   (a) HF (b) HCl
   (c) HI (b) HBr

2. Which of the following has the highest electron affinity?
   (a) F^- (b) O^-
   (c) O (d) Na

3. Highest oxidation state of Mn is present in
   (a) $KMnO_4$ (b) K_2MnO_4
   (c) Mn_2O_3 (d) MnO_2

4. Maximum number of H–bonds in one molecule of water is
   (a) 1 (b) 2
   (c) 3 (d) 4

5. Among the given compounds, one which can be distinguished by $AgNO_3$ is
   (a) ethane (b) ethylene
   (c) acetylene (d) diethyl ether

6. Oxalic acid on heating with conc. H_2SO_4 gives
   (a) CO only
   (b) CO_2 only
   (c) $CO_2 + H_2O$
   (d) $CO + CO_2 + H_2O$

(b) phenylacetic acid undergoes partial ionisation in benzene
(c) phenylacetic acid undergoes complete ionisation in benzene
(d) phenylacetic acid dimerises in benzene

24. In the following reaction, the product 'R' is

$$CaC_2 \xrightarrow{H_2O} P \xrightarrow[\text{tube}]{\text{Hot iron}} Q \xrightarrow[AlCl_3]{CH_3Cl} R$$

(a) benzene (b) ethylbenzene
(c) toluene (d) n-propylbenzene

25. Bromine water reacts with SO_2 to form
(a) HBr and S (b) H_2O and HBr
(c) S and H_2O (d) H_2SO_4 and HBr

26. Which of the following transition metal ions is not coloured?
(a) Cu^+ (b) V^{3+}
(c) Co^{2+} (d) Ni^{2+}

27. The reaction,
N_2O_5 in CCl_4 (solution) $\longrightarrow$

$$2NO_2 \text{ (solution)} + \frac{1}{2}O_2(g)$$

is of first order in N_2O_5 with rate constant $6.2 \times 10^{-4}\ s^{-1}$. What is the value of rate of reaction when $[N_2O_5] = 1.25$ mol L^{-1}?
(a) 5.15×10^{-5} mol $L^{-1}s^{-1}$
(b) 6.35×10^{-3} mol $L^{-1}s^{-1}$
(c) 7.75×10^{-4} mol $L^{-1}s^{-1}$
(d) 3.85×10^{-4} mol $L^{-1}s^{-1}$

28. A developer used in photography is
(a) a weak acid
(b) a weak base
(c) a mild reducing agent
(d) an oxidizing agent

29. If 1 mole of an ideal gas expands isothermally at 37°C from 15 L to 25 L, the maximum work obtained is
(a) 12.87 J (b) 6.43 J
(c) 8.57 J (d) 2.92 J

30. The shape of IF_7 molecule is
(a) octahedral
(b) trigonal bipyramidal
(c) tetrahedral
(d) pentagonal bipyramidal

31. Hydrolysis of sucrose is called
(a) inversion (b) esterification
(c) hydration (d) saponification

32. What will be the partial pressure of He and O_2 respectively, if 200 mL of He at 0.66 atm and 400 mL of O_2 at 0.52 atm pressure are mixed in 400 mL vessel at 20°C?
(a) 0.33 and 0.56 (b) 0.33 and 0.52
(c) 0.38 and 0.52 (d) 0.25 and 0.45

33. In which process, fused sodium hydroxide is electrolysed for extraction of sodium?
(a) Castner's process (b) Cyanide process
(c) Down's process (d) Both (b) and (c)

34. At room temperature, the eclipsed and staggered forms of ethane cannot be isolated because
(a) they interconvert rapidly
(b) both the conformers are equally stable
(c) the energy difference between the conformers is large
(d) there is a large energy barrier of rotation about the σ bond

35. In an experiment, 4 g of M_2O_x oxide was reduced to 2.8 g of the metal. If the atomic mass of the metal is 56 g mol^{-1}, the number of O atoms in the oxide is
(a) 1 (b) 2
(c) 3 (d) 4

36. Hydrolysis of trichloromethane with aqueous KOH gives
(a) methanol (b) acetic acid
(c) ethanol (d) formic acid

37. Primary, secondary and tertiary amines can be distinguished by
(a) Schiff's test (b) Fehling's test
(c) Tollen's test (d) Hinsberg test

38. In the complex ion $[Co(NH_3)_6]^{3+}$, the NH_3 molecules are linked to the central metal ion by
(a) ionic bonds
(b) covalent bonds
(c) coordinate bonds
(d) hydrogen bonds

39. The heat liberated when 1.89 g of benzoic acid is burnt in a bomb calorimeter at 25°C increases the temperature of 18.94 kg of water by 0.632°C. If the specific heat of water at 25°C is 0.998 cal/g-deg, the value of the heat of combustion of benzoic acid is
(a) 881.1 kcal (b) 771.4 kcal
(c) 981.1 kcal (d) 871.2 kcal

40. When ethanal is treated with Fehling's solution, it gives a precipitate of
(a) Cu_2O (b) Cu
(c) Cu_3O (d) CuO

41. The electronegativity of the following elements increases in the order
(a) C, N, Si, P (b) N, Si, C, P
(c) Si, P, C, N (d) P, Si, N, C

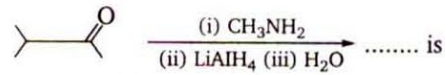
42. Permanent hardness of water can be removed by adding
(a) Na_2CO_3 (b) K
(c) Ca(OCl)Cl (d) Cl_2

43. The compound containing coordinate bond is
(a) SO_3 (b) O_3
(c) H_2SO_4 (d) All of these

44. Which of the following molecules has trigonal planar geometry?
(a) BF_3 (b) NH_3
(c) PH_3 (d) IF_3

45. Which of the following compounds, on reaction with NaOH and Na_2O_2, gives yellow colour?
(a) $Zn(OH)_2$ (b) $Al(OH)_3$
(c) $Cr(OH)_3$ (d) $CaCO_3$

46. The major organic product formed from the following reaction



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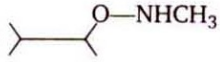
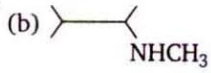
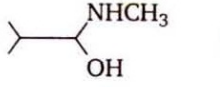
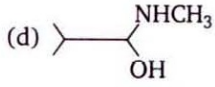
(a) 

(b) 

(c) 

(d) 

47. If 1,3-dibromopropane reacts with zinc and NaI, the product obtained is
(a) propene (b) propane
(c) cyclopropane (d) hexane

48. In the equation;
$4M + 8CN^- + 2H_2O + O_2 \longrightarrow 4[M(CN)_2]^- + 4OH^-$
Identify the metal *M*.
(a) copper (b) iron
(c) gold (d) zinc

49. Ammonia, on reaction with excess of chlorine, gives
(a) NCl_3 and HCl (b) N_4 and NH_4Cl
(c) NCl_3 and NH_4Cl (d) N_2 and HCl

50. If the supply of oxygen is limited, H_2S reacts with O_2 to form
(a) $H_2O + SO_3$ (b) $H_2O + S$
(c) $H_2SO_4 + S$ (d) $H_2O + SO_2$

Answer Key

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