



- (v) Discuss in detail about self ionization of water and prove that  $\text{pH} + \text{pOH} = \text{pK}_w = 14$ .
- (vi) Calculate the solubility of AgCl in pure water.  
[Given  $K_{sp}$  of AgCl =  $2.8 \times 10^{-10}$ ].
- (vii) Describe Lassaigne test for the detection of nitrogen and Sulphur.
- (viii) Draw E, Z structure for 2-Chloro-2-butene.
- (ix) Draw all possible isomeric structure for aliphatic compound having molecular formula  $\text{C}_4\text{H}_{10}$  and give their IUPAC name.
- (x) Define : Ligands and Coordination sphere.
- (xi) Give the structural formula for,  
(a) Potassium hexacyanoferrate (III)      (b) Dichloroargentate (I) ion.
- (xii) Differentiate between : Double salt and complex compound.

Q-3 Give broad classification and application of chemical analysis. [10]

OR

Q-3 Give classification of error and list out different methods for the minimization of systematic error and describe any three of them. [10]

- Q-4 [A] Explain selective precipitation with suitable example. [4]
- [B] "All Lowri – Bronsted bases are Lewis bases whereas all Lowri – Bronsted acids are not Lewis acids." Explain. [3]
- [C] Calculate the solubility of  $\text{PbSO}_4$  in (i) pure water and in (ii) 0.1 M  $\text{Pb}(\text{NO}_3)_2$ . [3]  
[Given  $K_{sp}$  of  $\text{PbSO}_4 = 1.8 \times 10^{-8}$ ].

OR

- Q-4 [A] Discuss the Arrhenius concept of acids and bases. What are the limitation of this concept ? [4]
- [B] Define : (i) Sparingly soluble salt (ii) common ion effect [3]  
(iii) Lowery- Bronsted acids.
- [C] Calculate the solubility of  $\text{CaF}_2$  in (i) pure water and in (ii) 0.1 M  $\text{Ca}(\text{NO}_3)_2$ . [3]  
[Given  $K_{sp}$  of  $\text{CaF}_2 = 1.7 \times 10^{-10}$ ].

- Q-5 [A] The names given below are objectionable. Write their structure and correct IUPAC name. [4]
- (i) 2-isopropyl-1-propene (ii) 2,4,5-trimethylpentane  
 (iii) 2,2-diethylbutane (iv) 2-ethyl-1-pentane.
- [B] Explain : Boiling point of n-pentane, isopentane and neopentane are 36°, 28° and 9.5°C respectively. [3]
- [C] Combustion of a 5.17 mg sample of a compound gave 10.32 mg of CO<sub>2</sub> and 4.23 mg of H<sub>2</sub>O. The molecular weight of compound is 88 gm/mole. What is the molecular formula of the compound ? [3]  
 (Given : Atomic Weight of C = 12.01, H = 1.008, O = 16.0 gm/mole)

OR

- Q-5 [A] Draw the structure for the following and write their IUPAC name. [4]
- (i) Vinyl chloride (ii) Isobutane (iii) Allyl bromide (iv) Neopentane.
- [B] Write kjeldahal's method for the quantitative analysis of nitrogen. [3]
- [C] What is the percentage composition of C, H and Cl in the molecular formula of C<sub>3</sub>H<sub>7</sub>Cl ? [3]  
 (Given : Atomic Weight of C = 12.01, H = 1.008, Cl = 35.45 gm/mole)

- Q-6 [A] Define Chelates and describe their uses. [4]
- [B] Describe the possible geometries of complex having coordination number six. [3]
- [C] Give the name and structure for the following abbreviations. [3]
- (i) en (ii) (dmg)<sup>-</sup> (iii) pn

OR

- Q-6 [A] Give the classification of ligands. [4]
- [B] Define : (i) Ambidentate ligand (ii) Coordination number (C.N.) [3]  
 (iii) Simple salt
- [C] Write IUPAC name for the following coordination compounds: [3]
- (i) [Ag(NH<sub>3</sub>)<sub>2</sub>]<sup>+</sup> (ii) [Co(NH<sub>3</sub>)<sub>6</sub>]Cl<sub>3</sub> (iii) Na<sub>3</sub>[Fe(CN)<sub>6</sub>]

