Q-1 Multiple choice questions. (mention the correct option in the given answer book).

1. From the following which analysis is based on amount of sample?
   (a) Proximate analysis    (b) Qualitative Analysis
   (c) Macro analysis        (d) Complete Analysis

2. Which one of following is based on spectroscopic properties measurements?
   (a) Chromatography        (b) Flame photometry
   (c) Potentiometry          (d) Titrimetry

3. The digits of a number which are needed to express the precision of the measurements from which the numbers was derived are known as.....
   (a) Standard Deviation    (b) Significant Figures
   (c) error                 (d) mean

4. The conjugate base of H$_3$O$^+$ is.....
   (a) H$_2$O           (b) OH$^-$     (c) HCO$_3^-$ (d) None of these

5. According to Lewis concept, acid is:
   (a) electron donor      (b) electron acceptor
   (c) proton donor         (d) proton acceptor

6. During combustion of organic compound CuO is used as:
   (a) catalyst           (b) oxidizing agent
   (c) solvent            (d) reducing agent

7. The correct name of 6-octene is:
   (a) 2-octene        (b) octane
   (c) 3-octene         (d) none of these

8. The abbreviation "en" is used for
   (a) Ethylene diaminetetraacetato (b) Ethylene diamine
   (c) Dimethyl glyoxime            (d) Diethylene triamine

9. The ligands which can be coordinated to the central metal ion through either of the two donor atoms are called.........
   (a) bi-dentate Ligand          (b) Bridging Ligand
   (c) Polydentate Ligand         (d) Ambidentate Ligand

10. In co-ordination compound primary valency of a central metal ion is satisfied by,
    (a) cation      (b) ligand
    (c) carbocation (d) negative ions
Q-2 Attempt Any Ten Questions.

1. Discuss the stages of analysis.
2. The following values were obtained for the determination of Cadmium in a sample of dust 4.3, 4.1, 4.03, 3.2 µg. g⁻¹ should the last value 3.2 be rejected? Qcritical is 0.831.
3. "Precision always accompanies accuracy but high degree of precision does not mean accuracy" justify.
4. Define and explain sparingly soluble salts with the example.
5. Discuss the concept of Lowry-Bronsted acid-base with suitable example.
6. The solubility product of AgCl is 2.8x10⁻¹⁰. Determine the solubility of AgCl in pure water.
7. Explain Lassaign's test for the detection of elements in organic compounds.
9. "As number of branch increases in n-alkane, boiling point decreases"—why?
10. Give IUPAC nomenclature of: $\text{H}_3\text{CoCl}_6$, $K_4[\text{Ni(CN)}_4]$.
11. Defines terms: Bridging Ligand, Co-ordination Sphere.
12. Discuss on chelation.

Q-3 (a) Discuss the any five methods for minimization of systematic errors. Give classification of quantitative analysis and discuss any one in detail. OR
(b) Write applications of Analytical chemistry in various fields.
(c) Define Accuracy. Discuss methods for determination of accuracy.

Q-4 (a) Discuss on self-ionization of water and prove that $\text{pH} + \text{pOH} = 14$.
(b) Explain on: Lewis concept of acids and bases.
(c) Calculate solubility of $\text{CaF}_2$ in pure water and in 0.1M $\text{Ca(NO}_3)_2$. If Ksp of $\text{CaF}_2$ is $1.7\times10^{-10}$.

OR
Q-4 (a) Write a note on: Selective precipitation.
(b) Discuss on Arrhenius theory of acid-base.
(c) Explain on strength of acids and bases.

Q-5 (a) Explain on quantitative analysis of carbon and hydrogen in organic compounds.
(b) Draw $E-Z$ isomers for the following.
   (a) 2-pentene  (b) 1-bromo-1,2-dichloro ethane
(c) Explain: Boiling point of n-butane, n-pentane and n-hexane are 0°, 36° and 69° respectively.

OR
(b) In C and H analysis of organic sample having weight 50 mg gave 150 mg of C and 72 mg of H₂O. Determine percentage of carbon, hydrogen and oxygen.
(c) Explain: 1-butene does not show geometric isomerism while 2-butene shows it.

Q-6 (a) What is Ligand? Give classification of Ligand based on dentate character.
(b) Discuss co-ordination theory or Werner's co-ordination theory.

OR
Q-6 (a) Define chelates and give uses of chelates.
(b) Discuss geometry and draw the structures of complexes having co-ordination numbers 4 and 6.

***ALL THE BEST***