PHARMACEUTICAL ANALYSIS - I

1. Significance of quantitative analysis in quality control, Different techniques of analysis, Preliminaries and definitions, Significant figures, Rules for retaining significant digits, Types of errors, Mean deviation, Standard deviation, Statistical treatment of small data sets, Selection of samples, Precision and accuracy. Fundamentals of volumetric analysis, methods of expressing concentration, primary and secondary standards.

2. Acid Base Titrations:

Acid base concepts, Role of solvent, Relative strengths of acids and bases, Ionization, Law of mass action, Common-ion effect, Ionic product of water, pH, Hydrolysis of salts, Henderson-Hessel. bach equation, Buffer solutions, Neutralization curves, Acid-base indicators.
Theory of indicators, Choice of indicators, mixed indicators, Polyprotic system, Polyamine and amino acid e systems, Amino acid titration, applications in assay of HIO_4, $NaOH$, $CaCO_3$ etc.

3. Oxidation Reduction Titrations :

Concepts of oxidation and reduction, Redox reactions, Strengths and equivalent weights of oxidizing and reducing agents, Theory of redox titrations, Redox indicators, Cell representations, Measurement of electrode potential, Oxidation-reduction curves, Iodimetry and Iodometry, Titrations involving ceric sulphate, potassium iodate, potassium bromate, potassium permanganate; titanous chloride and sodium 2, 6-dichlorophenol indophenol.

4. Precipitation Titrations :

Precipitation reactions, solubility products, Effect of acids, temperature and solvent upon the solubility of a precipitate. Argentometric titrations and titrations involving ammonium or potassium thiocynate, mercuric nitrate, and barium sulphate, Indicators, Gay-Lussac method, Mohr's method, Volhard's method and Fajan's method.

5. Gravimetric Analysis :

Precipitation techniques, Solubility products; The colloidal state, Supersaturation co-precipitation, Post precipitation, Digestional washing of the precipitate, Filtration, Filter papers and crocibles, Ignition, Thermogravimetric curves, Specific examples like barium sulphate, aluminium as aluminium oxide, calcium as calcium oxalate and magnesium as magnesium pyrophosphate, Organic precipitants.