

2nd SEMESTER

PHARMACEUTICAL ANALYSIS –I

THEORY 3 hours/week

UNIT –I

- 1. Introduction to Pharmaceutical Analysis:** Significance of qualitative analysis in quality control, Different techniques of analysis, Preliminaries and definitions, Fundamentals of volumetric analysis, methods of expressing concentration, primary and secondary standards, introduction to some basic techniques used in pharmaceutical analysis. Significance of figures. Rules for retaining significant digits. Types of errors, minimization of error, selection of sample for different pharmaceutical dosage forms, precision and accuracy.

UNIT –II

- 1. Acid Base Titration:** Acid base concepts role of solvers, Relative strength of acids and bases, Ionization, Law of mass action, Common ion effect, ionic product of water, pH, Hydrolysis of salts, Henderson-Hasselbalch equation, Buffers solutions, Neutralization curves, Acid-base indicators, Theory of indicators, Choice of indicators, Mixed indicators, Polyamine and amino acid systems. Amino acid titration, applications in assay, H_3PO_4 , NaOH, $CaCO_3$ etc.

UNIT –III

- 1. Non-aqueous Titrations:** Acidimetry & Alkalimetry. Basic principles, solvents involved indicators. Typical examples of Acidic & Basic drug molecules.
- 2. Complexometric Titrations:** Types of complexometric titrations, Metal ion indicators, Complexometric titrations involving EDTA. Typical examples of complexometric titration.

UNIT -IV

- 1. Precipitation Titrations:** Precipitation reactions, solubility product, effect of acids, temperature and solvent upon the solubility of a precipitate, Argentometric titration and titrations involving ammonium or potassium thiocyanate, mercuric nitrate and barium sulphate, Indicators, Gay-Lussac method; Mohr's method, Volhard's method and Fajan's method.

UNIT-V

- 1. 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, Iodimetry and Iodometry, Titrations involving ceric sulphate, potassium iodate, potassium bromate, potassium permanganate, Titanous chloride and sodium 2, 6-dichlorophenol indophenol.

RECOMMENDED BOOKS:

1. Vogel's Text book of Quantitative Chemical Analysis (Person Education, Singapore)
2. Garratt , The Quantitative analysis of drugs
- 3 H.H.Willard, Instrumental Methods of Analysis (CBS Publishers, Delhi)
4. Indian Pharmacopoeia Vol-1,2 & 3

PHARMACEUTICAL ANALYSIS –I

PRACTICAL 3 hours/week

(A minimum of 15 experiments shall be conducted)

1. Standardization of analytical weights and calibration of volumetric apparatus.
2. Preparation and standardization of sodium carbonate, potassium hydrogen phthalate, sodium bicarbonate, oxalic acid.
3. Assay of boric acid, zinc oxide, ammonium carbonate and amino acids.
4. Preparation and standardization of silver nitrate and ammonium thiocyanate.
5. Titration according to Mohr's and Volhard's methods.
6. Preparation and standardization of perchloric acid and sodium methoxide and assay of one official drug under each type.
7. Preparation and standardization of EDTA solution and assay of calcium gluconate.
8. Preparation and standardization of some redox titrants e.g. potassium permanganate, potassium dichromate, iodine, sodium thiosulphate etc. Exercises involving potassium iodate, potassium bromate, iodine solution, sodium 2, 6-chlorophenolindophenol, and ceric ammonium sulphate.