

BP102T. PHARMACEUTICAL ANALYSIS (Theory) 45 Hours

Course Content:

Unit-I

10 Hours

Pharmaceutical analysis: Definition and scope.

- i) Different techniques of analysis.
- ii) Methods of expressing concentration.
- iii) Primary and secondary standards.
- iv) Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, sulphuric acid, potassium permanganate and ceric ammonium sulphate.

Errors: Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures.

Pharmacopoeia, Sources of impurities in medicinal agents, limit tests.

Unit-II

10 Hours

Acid base titration: Theories of acid base indicators, classification of acid base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves.

Non-aqueous titration: Solvents, acidimetry and alkalimetry titration and estimation of Sodium benzoate and Ephedrine HCl.

Unit-III

10 Hours

Precipitation titrations: Mohr's method, Volhard's, Modified Volhard's, Fajan's method, estimation of sodium chloride.

Complexometric titration: Classification, metal ion indicators, masking and demasking reagents, estimation of Magnesium sulphate, and calcium gluconate.

Gravimetry: Principle and steps involved in gravimetric analysis. Purity of the precipitate: co-precipitation and post precipitation, Estimation of barium sulphate.

Basic Principles, methods and application of diazotization titration.

Unit-IV

08 Hours

Redox titrations: Concepts of oxidation and reduction, Types of redox titrations (Principles and applications).

Cerimetry, Iodimetry, Iodometry, Bromometry, Dichrometry and titration with potassium-iodate.

Unit-V**07 Hours****Electrochemical methods of analysis:****Conductometry-** Introduction, Conductivity cell, Conductometric titrations, applications.**Potentiometry-** Electrochemical cell, construction and working of reference (Standard hydrogen, silver chloride electrode and calomel electrode) and indicator electrodes (metal electrodes and glass electrode), methods to determine end point of potentiometric titration and applications.**Polarography** - Principle, Ilkovic equation construction and working of dropping mercury electrode and rotating platinum electrode, applications.

BP108P. PHARMACEUTICAL ANALYSIS (Practical)

4 Hours / Week

I Limit Test of the following:

- (1) Chloride.
- (2) Sulphate.
- (3) Iron.
- (4) Arsenic.

II Preparation and standardization of

- (1) Sodium hydroxide.
- (2) Sulphuric acid.
- (3) Sodium thiosulfate.
- (4) Potassium permanganate.
- (5) Ceric ammonium sulphate.

III Assay of the following compounds along with Standardization of Titrant:

- (1) Ammonium chloride by acid base titration.
- (2) Ferrous sulphate by Cerimetry.
- (3) Copper sulphate by Iodometry.
- (4) Calcium gluconate by Complexometry.
- (5) Hydrogen peroxide by Permanganatometry.
- (6) Sodium benzoate by non-aqueous titration.
- (7) Sodium Chloride by precipitation titration.

IV Determination of Normality by electro-analytical methods:

- (1) Conductometric titration of strong acid against strong base.
- (2) Conductometric titration of strong acid and weak acid against strong base.
- (3) Potentiometric titration of strong acid against strong base.

Recommended Books: (Latest Editions)

- Vogel's Textbook of Quantitative Chemical Analysis by Mendham J., Denny R.C., Barnes J.D., Thomas M, Jeffery G.H., Pearson Education Asia.
- A Textbook of Pharmaceutical by Connors K.A., Wiley Inter-science.
- Practical Pharmaceutical Chemistry by Beckett A.H., and Stenlake J.B., Vol. I & II. Athlone Press, University of London.
- British Pharmacopoeia, Her Majesty's Stationary Office, University Press, Cambridge.
- Quantitative Analysis by Alexeyev V., CBS Publishers & Distributors, New Delhi.
- The Pharmacopoeia of India, the Controller of Publications, Delhi.
- Bentley and Driver's Textbook of Pharmaceutical Chemistry, Oxford University Press, New Delhi.
- Analytical Chemistry Principles by John H. Kennedy, Cengage Learning, Delhi.