Subject Code : P8AP11

CORE COURSE - XI ANALYTICAL INSTRUMENTATION

Unit I- X-Ray, UV, IR and Raman Spectroscopy

Classification of instrumental methods – introduction to spectroscopy – properties of EMR – EM Spectrum – X-ray – Instrumentation for X-ray spectrometry- X-ray diffractometer- X-ray absorption- UV spectroscopy- Orgin and theory-Instrumentation – applications- Theory of IR – Instrumentation –Applications- Raman spectroscopy- Mechanism for Raman effect- Instrumentation – Applications.

Unit II- NMR, ESR and Emission Spectroscopy

Introduction to NMR – Quantum description of NMR – Instrumentation – Chemical shift – spin – spin coupling –applications- Theory of ESR – Instrumentation – Hyperfine splitting – determination of 'g' value – line width – theory of emission spectroscopy – instrumentation- applications

Unit III – Mass and Atomic absorption Spectroscopy

Theory of mass spectrometer – components of mass spectrometer -applications– Principles of atomic Absorption Spectroscopy – Instrumentation – Single and Double beam Atomic Absorption Spectrometers

Unit IV -Thermal methods and Chromatography

Introduction to thermal methods analysis – thermo gravimeter – differential thermal analysis- Chromatography- Basic parts of chromatography- Methods of measurement – Liquid chromatography – Types- amino acid analyzer- Gas Chromatography

Unit V – Electromechanical Instruments

Electrochemical cell- Types of Electrodes- Conductivity meter- Polorography- Coulometers- Amperometers- Aqua meter- P^H measurement- Principle- P^H meters- Selective ion electrodes.

Books for study

1. H.H. Willard, L.L. Merit, J.A. Dean, F.A. Settle, Instrumental Methods of Analysis, CBS Publishers and Distributors, New Delhi, (1986). (Unit I, II & III)
2. R.S. Khandpur, Handbook of analytical instrumentation, Tata McGraw Hill Pvt Ltd., New Delhi, (2001). (Unit IV & V)

Books for Reference

1. G.Chatwal, S.Anand, Instrumental Methods of Chemical Analysis, Himalaya Publications House, New Delhi, (1996).
2. Robert, D. Braun, Introduction to Instrumental analysis, McGraw Hill Book House, New Delhi, (1986).