

SCA-S-404

Andhra University

Department of Inorganic and Analytical Chemistry

M.Sc Final Chemistry

Syllabus for IV th Semester

Specialisation : *Analytical Chemistry*

Paper - IV : Instrumental Methods of Analysis -II

W.E.S-2005-2006 Admi Hall Batch

Unit - I : Spectroscopic Methods - 1

- (a) *Mass Spectroscopy*: principle, basic instrumentation, energetics of ion formation, types of peaks observed, resolution, qualitative analysis, molecular weight determination, quantitative analysis, advantages
- (b) *X-ray Spectroscopy (XRF)*: chemical analysis by X-ray spectrometers, energy dispersive and wavelength dispersive techniques, evaluation methods, instrumentation, matrix effects, applications.

Unit - II : Spectroscopic Methods - 2

- (a) *Infrared spectroscopy*: units of frequency, wavelength and wave number molecular vibrations, factors influencing vibrational frequencies, instrumentation, sampling techniques, detectors, characteristic frequencies of organic molecules, qualitative and quantitative analysis with reference to (petroleum refinery and polymer industry), selected molecules like CO, CO₂, non-destructive IR method for the analysis of CO and other organic compounds, principles of Fourier transform IR.
- (b) *Raman Spectroscopy*: Raman effect and spectra, differences between Raman spectra and IR spectra, instrumentation, Raman spectra of CO, CO₂, N₂O, H₂O.

Unit - III Thermal methods of Analysis

- (a) Thermo gravimetry-theory, instrumentation, applications with special reference to CuSO₄.5H₂O, CaC₂O₄.2H₂O, CaCO₃, (COOH)₂.2H₂O
- (b) Differential thermal analysis-principle, instrumentation, difference between TG and DTA, applications with special reference to the clays and minerals, coals (fuels)
- (c) Differential scanning calorimetry-principle, instrumentation, applications to inorganic materials like chlorates and per chlorates, ammonium nitrate.
Organic compounds and Drugs.