CY- 126 ANALYTICAL CHEMISTRY-I

Introduction: Introduction and scope of analytical chemistry, Major steps in total chemical analysis, a general survey of all analytical methods.

Errors in Chemical Analysis: Evaluation of reliability of analytical data, Significant figures, Selection of central best value from a set of data, Precision and accuracy, Methods to measure precision, Classification of errors, Distribution of data from replicate measurements, Comparison of results, Student 't' test, Modern trends in quality control.

Gravimetric Methods of Analysis: combustion analysis, Precipitation process: solubility, filterability, purity, composition of the product, scope of gravimetric analysis, calculation of gravimetric analysis.

Acid Bases and Buffers: Acid Base strength, pH and pOH, buffer solution and buffer capacity.

Volumetric Methods of Analysis: Titration calculations, precipitation titration, acid base titration, acid base indicators, Primary standards for acids and bases, acid base titrations in non-aqueous solutions, redox titration, end point location in acid base titrations, oxidation-reduction titrants, non-aqueous redox titrations, complexation titrations, titrations for complexation titrations, complexation titration curves, end point location in complexation titrations.

Spectroscopic Methods of Analysis: Overview of spectroscopy, basic components of spectroscopic instrumentation, Absorbance of electromagnetic Radiation, Transmittance and absorbance, Beer's Law, Limitations to Beer's Law, Ultraviolet-Visible Spectrophotometer: instrumentation, Quantitative and qualitative applications. Atomic Absorption spectrophotometry: instrumentation, Quantitative and qualitative applications.

Calibrations and Standardizations: Reagents used as standards, Single point vs multiple point standardizations, External standards, Standard Additions, Internal Standards, Linear regressions and calibration curves.

Analysis of Real Samples: Sampling, Digestion of samples by dry and wet ashing with special reference to Kjeldahl's method for nitrogen determination, Fluxes.**Analysis of Real Samples:** Sampling, Digestion of samples by dry and wet ashing with special reference to Kjeldahl's method for nitrogen determination, Fluxes.