CY-127 Physical Chemistry-I

Introduction to Phase Equilibria: Phase, component and degree of freedom, Phase rule and its applications, One component system (water, carbon dioxide), Polymorphism, **Enantiotropy**, Two component systems (sulphur, Pb, Ag system), Vapour pressure diagram, Temperature composition diagrams, Azeotropes, Liquid-liquid phase, Liquid- solid phase.

Chemical Dynamics in Gases: The Postulates of kinetic theory of Gases, Translational K.E. of molecules, kinetic theory of temperature, Energy units for PV and RT, Mean Square velocity & Root mean square velocity, Graham's law of effusion, Distribution of molecular velocities, Vander Waal's equation.

Kinetic Theory of Matter: Theories pertaining to distribution of energies into different groups, Maxwell Boltzmann distribution law for energies of molecular systems, Method for the determination of Avogadro'snumber.

Solution: The properties of mixtures/solutions, Concentration terms, Thermodynamic description of mixtures, Partial molar quantities, Chemical potential of liquids, Ideal solutions, Raoult's Law, The properties of solutions: liquid mixtures, Colligative properties, Common features of colligative properties, Elevation of boiling point, Depression of freezing point, Solubility, Osmosis and Osmotic pressure, Solvent and solute activity, Vant Hoff's theory of dilute solutions.

Conductance: Theory of electrolytes, Electrolytic conduction, Conductance, Specific, Equivalent and molar conductance, Circuit of conductivity meter, Measurements of cell constant, Arrhenius theory of ionization, Debye Hackle theory, Asymmetry or relaxation effect, Solvent effect, Electrophoretic effect, Debye Huckel Onsagar equation, Ion pair, Ion triplet formation, Transport numbers, Ion motilities and their calculations, Types of conductometric titrations, Applications of conductance in relation to Aa & Ka for weak and strong electrolyte, Determination of absolute ionic motilities, Solubility of sparingly soluble salts, Kw, Basicity of an organic acid, Speed ratio by transport number, Advantages of conductometric titration over volumetric titration.

Electrochemistry: Introduction to electrochemical processes: Redox Reactions, Electrode potential of a cell,Nernst theory of electrode potential, Laws of electrolysis, Corrosion, Rate of corrosion, Inhibition of corrosion, Electrical currents in ionic solutions.