Paper 402102 Physical Chemistry 3 Credits, 75Marks(45 Hrs)

3 Hrs/Week

I) Phase Equilibrium: 15 Hrs

Statement and Meaning of the terms:Phase,Component,Degree of freedom,Derivation of phase rule equation.

Phase Equilibria of the one component system:Water system.

Phase Equilibria of two components system:solid-liquidequilibria, simple eutectic Pb-Ag system, desilverisation of lead.

Solid solutions : compound formation with congruent melting point (Mg-Zn) and incongruent melting point ($FeCl_3$ –H_2O)system, freezing mixture, acetone-dry ice, liquid-liquid mixture, Raoult's law and Henry's law.

Ideal and non-ideal system :azotropes, HCl-H2O and ethanol – water system. Partially miscible liquids:phenol-water,trimethyl amine-water, nicotine-water system,lower and upper consulate temperature. Effect of impurity on consulate temperature

II) Electro chemistry-I 15 Hrs

Electrical Transport:Conduction in metals and in electrolytesolutions : specific conductance and equivalent conductance,measurement of equivalent conduction,variation of equivalent and specific conductance with dilution. Numerical problems.Kohlrausch's law and its application weak and strong electrolytes,Ostwald'sdilution law ,its use and limitations. Transportnumber:Definition,Determination by Hittorf's method and moving boundary method. Conductometric titration: types and its advantages.

III) Electrochemistry-II 15Hrs

Types of reversible electrodes:gas-metalion,metal-metal ion,metal-insoluble salt anion and redox electrodes. Nernst equation,derivation ofcell,E.M.F.and single electrode potential,standard hydrogen electrode,referenceelectrode,standard electrode potential,signsconventions,electro-chemical series and its significance,electrolytic and galvanic cells,reversible and irreversible cells,conventionalrepresentation of electro chemical cells E.M.F.of a cell and its measurement,calculation of thermodynamic quantities of cell reactions (G,H and K).

Definition of pH,pKa-determination of pH using SHE and Glass electrode by potentiometer method. Buffer-Acidic and basic buffers,mechanism of Buffer Action,Henderson-Hasselbalch equation.