

**CURTAILED SYLLABUS**  
**B. Sc. (Physical Chemistry)**  
**For Session 2020-2021 Only**

---

**B.Sc Part-I**

**1. GASES**

Kinetic theory of gases and gas laws, specific heat ratio  $C_p/C_v$ . Non-ideality of gas behavior, Van der Waals equation of state, critical constants and their determination. Law of corresponding states, Maxwell Law of distribution (Quantitative treatment).

**2. THE FIRST LAW OF THERMODYNAMICS**

Thermodynamic terms and statement of the first law, thermodynamic reversibility and maximum work, enthalpy of a system, heat capacity at constant volume and constant pressure. Extensive and intensive properties, state functions and exact differentials, cyclic rule. Variation of internal energy with temperature and volume, enthalpy as a function of temperature and pressure, relation between  $C_p$  and  $C_v$ . Joule-Thomson effect, Van der Waals equation and J-T effect. Important thermodynamic properties ( $W$ ,  $Q$ ,  $E$  and  $H$ ) in an isothermal expansion of an ideal gas and adiabatic expansion of an ideal gas.

**3. CHEMICAL KINETICS:**

Reaction rate, order and molecularity of reaction, zero, first, second and third order reactions. Methods of determining the order of a reaction, Complex reactions-opposing reactions, consecutive reactions and side reactions with reference to first order reactions. Energy of activation and collision theory of bi-molecular reactions.

**4. ELECTROCHEMISTRY:**

Electrolytic conductance, equivalent conductance, molecular conductance, variation of conductance with concentration, Qualitative treatment of interionic attraction theory. Ionic mobilities and transport number, determination of transport number (Hittorf and moving boundary method), Some applications of conductance measurements, hydrolysis of salts, pH and  $pK_a$ , acid-base concept in non-aqueous media, Buffer solutions.

**5. THERMOCHEMISTRY AND CHEMICAL EQUILIBRIUM**

Hess's law and its applications, Bond energy and resonance energy, Law of mass action and its applications to homogeneous and heterogeneous equilibria.

**SYLLABUS FOR B. Sc.-I**  
**CHEMISTRY PRACTICAL**

1. Analysis of inorganic mixture including insoluble and interfering radicals (Three radicals only). 12 Marks
2. Use of  $K_2Cr_2O_7$  (Determination of iron) and 12 Marks  
Iodometry and Iodimetry (Determination of Copper, dichromate, permanganate)
3. Detection of functional group or element in the given compound. 16 Marks
4. Record and viva-voce (5+5) = 10 Marks