

**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**  
**ENGG. CHEMISTRY – III (PHYSICAL)**

**SEMESTER –IV**

**TEACHING SCHEME**

**EXAMINATION SCHEME**

**SYLLABUS :**

- i) Additive & Constitutive properties, Molar volume, Parachor Molar refraction, Optical activity, Molar polarization, dipole moment, Viscosity, spectrum analysis, visible and invisible spectrum, different types of spectra.
- ii) Phase rule and terms involved in it, 1-, 2- and 3- component systems, Distribution law & Henry's Law. Process of Extraction
- iii) Velocity of reactions, molecular & order of reaction, first & second order reactions, determination of order of reaction.
- iv) Lambert's & Beer's law, Laws of Photochemistry, Quantum yield, high & low quantum yield, Method to determine quantum efficiency, types of photochemical reactions, Luminescence.
- v) Surface Chemistry & colloids, adsorption, Freundlich, Langmuir & Gibbs adsorption isotherms, Partition & adsorption chromatography, Classification, preparation, purification & properties of colloids, Emulsion and gels, catalysis, general criteria of homogeneous & heterogeneous catalysis, theories of catalysis.
- vi) First and Second law of thermodynamics, spontaneous processes, entropy, efficiency of reversible cycles, free energy & maximum equations, Van't Hoff isochors, heat of reaction, heat of combustion, heat of formation, Hess's law of heat summation, heat of neutralization, some numerical examples.
- vii) Isotopes & isobars, definition, identification by Aston's mass spectrograph, separation of isotopes, conclusions from isotropy.
- viii) Electronic theory of valence. Electrovalent, covalent & coordinate bonds.
- ix) Proton concept of acids, Lewis concept, Hydrolysis, degree of hydrolysis, relative strength of acids & bases, theory of indicators.
- x) H<sup>+</sup> ion conc., pH & its determination by electrometric methods using hydrogen, Redox & glass electrodes, pH-metric titrations.

**TEXT BOOKS :**

1. S. Glasstone, 'Elements of Physical Chemistry' Macmillan & Co. Ltd. London.
2. B.S. Bahl & G.D.Tuli, 'Essentials of Physical chemistry' S. Chand & Co., New Delhi.
3. A.J. Mee, 'Modern Physical Chemistry'