**Sri Ramakrishna Mission Vidyalaya College of Arts and Science**

**Coimbatore – 641 020**

Programme: B.Sc. Chemistry Course Code: 1CTO1

PART-III CORE –01 Course Title: **GENERAL CHEMISTRY- I**

Year: I Semester: I Credits: 5 Total Hours: 6 x15 = 90

**UNIT- I**

Structure of atom-discovery of electron, determination of e/m ratio, determination of charge of electron. Rutherford’s experiment and atomic model, Bohr’s atomic model. Black body radiation-failure of Wien and Raleigh-Jeans laws in explaining black body radiation. Planck’s quantum theory. Bohr’s explanation of atomic absorption spectrum of hydrogen. Einstein’s theory of photoelectric effect. de Broglie equation- derivation. Heisenberg’s uncertainty principle.

**UNIT-II**

Atomic orbitals, quantum numbers- principal, azimuthal, magnetic and spin quantum numbers and their significance, Pauli’s exclusion principle, Hund’s rule, aufbau principle, (n + l) rule, stability of half filled and completely filled orbitals.

Classification of s, p, d & f block elements, atomic volume, atomic and ionic radii, ionization potential, electron affinity and electronegativity – variation along periods and groups. Factors influencing periodic properties.

**UNIT- III**

Chemical bonding- Ionic bonding- factors influencing the formation of ionic bond-characteristics of ionic compounds-Born-Haber cycle. Covalent bond - factors influencing the formation covalent bond-partial ionic character in covalent bond-Fajan’s rule and coordinate bond.

**UNIT- IV**

Classification of organic compounds, functional group, homologous series. IUPAC system of nomenclature of alkanes, alkenes, alkynes, alcohols, aldehydes, ketones, carboxylic acids. Priority rules for multifunctional groups. Polar, non polar molecules, electron donating and withdrawing groups. Polar effects-inductive, mesomeric, electromeric and hyperconjugation. Homolytic and heterolytic fission- free radicals, carbocations, carbanions and their stabilities. Electrophiles and nucleophiles.

**UNIT- V**

Alkanes-general methods of preparation of alkanes, Hybridisation in methane. Chemical properties of alkanes-halogenation, nitration, sulphonation, oxidation, thermal decomposition, isomerisation and aromatization.

Alkenes-general methods of preparation of alkenes. Hybridisation in ethylene. Chemical properties of alkenes-hydrogenation, halogenation, hydrohalogenation(Markovnikoff’s rule and peroxide effect), hydration, hydroboration, oxidation by KMnO4 and ozonolysis.

**Text Books**

1. B. S. Bahl and Arun Bahl, Advanced Organic Chemistry,S.Chand&Company, Edn. (2010).

2. B. R. Puri and L. R. Sharma, Principles of Inorganic Chemistry , Milestone Publication, Edn.31 (2011).

3. B. R .Puri and L. R. Sharma, Principles of Physical Chemistry, Vishal Publication, Edn. 44 (2011).