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

**Coimbatore – 641 020**

Programme: B.Sc. Chemistry Course Code: 2CT02

PART-III CORE – 02 Course Title: **GENERAL CHEMISTRY- II**

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

**UNIT-I**

Chemical bonding- Valence Bond theory-formation of H2 molecule- concept of resonance-resonance energy- resonance structures of CO32- ion, O3­ and CO molecules. Molecular Orbital theory (MOT)-bonding and antibonding molecular orbitals. M.O. diagram and bond order calculations for H2, He2, N2 and O2. Valence Shell Electron Pair Repulsion (VSEPR) theory-geometry of BeF2, BF3, CH4, NH3, H2O and PCl5 only. Hydrogen bonding-intermolecular, intramolecular-consequences.

**UNIT- II**

General methods of preparation of alkynes, properties of alkynes-acidity of alkynes, hydration, hydroboration, oxidation with KMnO4, ozonolysis and polymerization.

Alkadienes-preparation-stability of conjugated dienes-1,2 and 1,4 addition. Diels- Alder reaction.

Alkyl halides-preparation by direct halogenations of alkenes, hydrohalogenation of alkenes and alkynes. Aliphatic nucleophilic substitution-SN1 and SN2 mechanisms. Grignard reagent preparation. Synthesis of alcohols, ketones, carboxylic acids and ethers from Grignard reagents.

**UNIT- III**

Cycloalkanes-synthesis by internal Wurtz reaction and Dieckmann reaction-ring opening reaction of cyclopropane and cyclobutane. Baeyer’s strain theory, Sache-Mohr theory. Aromaticity - Huckle’s rule and its applications to benzene, naphthalene, pyridine, pyrrole, cyclopropenyl cation and cyclopentadienyl anion. Aromatic hydrocarbons - mechanism of aromatic electrophilic substitution reactions- nitration, sulphonation, Friedel-Crafts alkylation and acylation of benzene.

**UNIT- IV**

Gaseous state-postulates of kinetic theory of gases-derivation of kinetic gas equation-derivation of Boyle’s law, Charles’ law, Avogadro’s law, ideal gas equation, Graham’s law of diffusion and Dalton’s law of partial pressures from kinetic gas equation. Maxwell’s distribution of molecular velocities (derivation not necessary). Root mean square velocity, average velocity and most probable velocity (derivation of equations not necessary). Collision diameter, collision frequency and mean free path (definition only).

**UNIT- V**

Colloids-classification, preparation and purification of colloids. Properties of colloids-optical, kinetic and electrical properties. Origin of charge of colloidal particles. Emulsions and gels-elementary treatment only.

Solid state-crystalline and amorphous solids-difference between them. Crystal systems- definitions of space lattice, Unit cell, Bravais lattice. Weiss and Miller indices

**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).