

**SARDAR PATEL UNIVERSITY**  
**Programme : B. Sc.**  
**Semester : II**  
**Syllabus Effective From : June 2018**  
**(30+70 Marks, 4 hrs per week)**

<b>Subject code : US02CCHE21</b>	<b>Total credits : 4</b>
<b>Title of subject: GENERAL CHEMISTRY- II</b>	

<b>Unit</b>	<b>Description In Detail</b>	<b>Weightage</b>
<b>I</b>	<b>ALKYL AND ARYL HALIDES</b> Homolytic and Heterolytic chemistry, Classification, Preparation, Reaction: Nucleophilic aliphatic substitution, SN2 Reaction: Mechanism & kinetics, Reactivity & steric hindrance, SN1 Reaction: Mechanism & kinetics, Carbocation, Structure of carbocation, Relative stability of carbocations, Stability of carbocation: polar effect, Rearrangement of carbocation, Reaction, Low reactivity of aryl and vinyl halides, Structure of aryl and vinyl halides, Nucleophilic aromatic substitution, Bimolecular displacement for nucleophilic aromatic substitution, Reactivity in nucleophilic aromatic substitution, Orientation in nucleophilic aromatic substitution, Electron withdrawal by resonance, Elimination-Addition mechanism, Benzyne, Problems.	<b>25%</b>
<b>II</b>	<b>CHEMICAL BONDING</b> The Lewis Theory, Sidgwick-powell Theory, Valence shell Electron pair Repulsion Theory (VSEPR), Effect of Lone Pair, Effect of electron negativity, Isoelectronic Principle, Some examples using VSEPR Theory like BF <sub>3</sub> and the [BF <sub>4</sub> ] <sup>-</sup> ion, Ammonia NH <sub>3</sub> , Water H <sub>2</sub> O, Phosphorus pentachloride PCl <sub>5</sub> , Chloride trifluoride ClF <sub>3</sub> , Sulphur tetrafluoride SF <sub>6</sub> , The triiodide ion I <sub>3</sub> <sup>-</sup> , Sulphur tetrafluoride SF <sub>4</sub> , Iodine heptafluoride IF <sub>7</sub> .  LCAO method, s-s combination of orbitals, s-p combination of orbitals, p-p combination of orbitals, Rules of linear combination of atomic orbitals, Examples of molecular orbital Treatment for Homo Nuclear Diatomic Molecules (H <sub>2</sub> <sup>+</sup> , H <sub>2</sub> , He <sub>2</sub> <sup>+</sup> , He <sub>2</sub> , C <sub>2</sub> , O <sub>2</sub> , B <sub>2</sub> , F <sub>2</sub> ).	<b>25%</b>
<b>III</b>	<b>[A] CHEMISTRY OF D-BLOCK ELEMENTS</b> Position of d-block elements in the periodic table, Electronic configuration and definition, Classification of d-block elements in 3d, 4d, 5d and 6d series.	<b>25%</b>

	<b>[B] FUNDAMENTAL CONCEPT OF COORDINATION CHEMISTRY</b> Definition of some terms, Classification of ligands, Chelate, chelating ligand and Chelation, Classification of chelates, Uses of Chelates, Co-ordination number and Stereochemistry of complexes, Nomenclature of co-ordination compounds.	
<b>IV</b>	<b>CHEMICAL KINETICS</b> Introduction, Reaction rate constant, Concentration Effects, Differential Rate Law, Integrated Rate Law (including first order, second order with one reactant and two reactant and zero order, Half lifeTime of a reaction, Methods of determining Order of reaction, Mechanism and rate law, reaction rates and equilibria, temperature effect, Numerical Problems based on above topics.	<b>25%</b>

**Basic text and Reference Books :**

1. Barrow, G. M., *Physical chemistry* (6<sup>th</sup> Edition).
2. Bahl, B.S., Tuli J. D., and Bahl, A, *Essentials of Physical Chemistry*.
3. Prakash S., Tuli, G. D., Basu, S. K., Madan R. D., *Advance inorganic chemistry* (Vol. - II).
4. Mahan, B.H. *University Chemistry*, 3rd Ed. Narosa.
5. Morrison, R. T. & Boyd, R. N., *Organic chemistry* (6<sup>th</sup> edition).
6. Cotton, F.A. & Wilkinson, G. *Basic Inorganic Chemistry*, Wiley.
7. Lee J. D., *Concise Inorganic Chemistry* ( 5th Edition).
8. Selected Topics in Inorganic Chemistry, Wahid U. Malik, G.D. Tuli, R.D. Madan.
9. Sharma K. K and Sharma L. K. , *A Text Book of Physical chemistry*, (5<sup>th</sup> Edition), Vikas Publishing House.
10. Clayden, J., Greeves, N., Warren, S., *Organic Chemistry* 2nd Edition, Oxford University Press.