

**SARDAR PATEL UNIVERSITY**  
**Programme: MSC (Integrated Biotechnology)**  
**Semester: I**  
**Syllabus with effect from: June 2010**

<b>Paper Code:</b> PS01CIGB02	<b>Total Credits: 3</b>
<b>Title Of Paper:</b> Organic Chemistry	

Unit	Description in detail	Weightage (%)
<b>1</b>	<p><b>IUPAC nomenclature:</b>                      Systemic IUPAC nomenclature of different class of organic compounds including alkanes, alkenes, alkynes, cycloalkanes, polycyclic, spiro and aromatic compounds.</p> <p><b>Reactive intermediates:</b>                      Generation, structure, stability and reactions of carbocation, carbanion, free radical and carbene (singlet and triplet). Ylide and enamines.</p> <p><b>Tautomerism :</b>                      Cationotropy and anionotropy. Prototropic shifts in different systems, ring chain tautomerism and valence tautomerism.</p>	
<b>2</b>	<p><b>Alkanes :</b>                      Physical properties, methods of preparation and reactions. Reactions of cycloalkanes. <b>Stereochemistry :</b> Elements of symmetry - centre, plane and axis of symmetry. Classification of stereoisomers. Separation of enantiomers. Absolute configuration (R and S). Conversion of projection formulae. Stereochemistry of compounds containing two asymmetric C-atoms. Conformations around a C-C bond in acyclic compounds. Structure of cycloalkanes, different kinds of strain in cyclic compounds. Cyclohexane conformations. Stereochemistry of disubstituted cyclohexanes.</p>	
<b>3</b>	<p><b>Alkenes :</b>                      Methods of preparations. Geometrical isomerism concept, E- and Z-nomenclature, Stereoselective and specific reactions. Reactions : Hydrogenation, addition of hydrogen halide, Markownikoff rule with explanation and peroxide effect, oxymercuration-demercuration, hydroboration-oxidation reaction, hydroxylation, ozonolysis, oxidation.                      Dienes - types of dienes and their characteristic reactions, effect of conjugation on stability and reactivity. Diels-alder reaction.</p>	
<b>4</b>	<p><b>Alkyl halides</b>                      Classification and nomenclature of alkyl halides. Preparation of alkyl halides and their reactions. <b>Functional derivatives of carboxylic acid:</b>                      Structure, nomenclature. Preparation of esters, anhydride and amide. Their reactions. Alkaline hydrolysis, tracer study and acidic hydrolysis of esters and transesterification. <b>Amines and Heterocyclic compounds:</b>                      Nomenclature of amines, basicity of amines, selected reactions and Hinsberg test. Nomenclature of single ring heterocyclic compounds, structures, preparation, properties and reactions of pyrrole, furan, furfural, thiophene and pyridine.</p>	
	<b>Practical:</b>	
	<b>Separation and identification of Organic binary [(A + B) (A + P) (A + N) (P + B) (P + N) (B + N)] compounds :</b>	
	<ul style="list-style-type: none"> <li>• Salicylic acid</li> </ul>	



	<ul style="list-style-type: none"><li>• Cinnamic acid</li><li>• Benzoic acid</li><li>• Phthalic acid</li><li>• <math>\alpha</math>-Naphthol</li><li>• <math>\beta</math>-Naphthol</li><li>• o-nitroaniline</li><li>• m-nitroaniline</li><li>• p-nitroaniline</li><li>• Naphthalene</li><li>• Benzamide</li><li>• p-dichlorobenzene</li><li>• Anthracene</li><li>• m-dinitrobenzene</li></ul>	
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**Basic Text & Reference Books:**

- Organic Chemistry by Morrison & Boyd VI<sup>th</sup> Ed.
- Stereochemistry by P. S. Kalsi.
- A text book of organic chemistry by Arun Bahl & B. S. Bahl, 16<sup>th</sup> Edition.
- Advance Organic Chemistry by Jerry March.
- Organic reaction mechanism, 3<sup>rd</sup> Ed. V. K. Ahluwalia & R. K. Parashar.
- An advance course in practical Chemistry by Ghoshal , Mahapatra, Nad.

