

P.B.SIDDHARTHA COLLEGE OF ARTS & SCIENCE
DEPARTMENT OF CHEMISTRY
M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
III SEMESTER

Paper Code & Title: 22CH3E4: ASYMMETRIC SYNTHESIS, PHOSPHORUS & SULPHUR REAGENTS, SYNTHETIC POLYMERS, BIOMOLECULES & BIO ORGANIC CHEMISTRY

No. of hours per week: 04
Total marks: 100

Total credits: 04
(Internal: 30 M & External: 70M)

Course:ASYMMETRIC SYNTHESIS, PHOSPHORUS & SULPHUR REAGENTS, SYNTHETIC POLYMERS, BIOMOLECULES & BIO ORGANIC CHEMISTRY (code 20CH3T3B)		
S.No	COURSE OUTCOMES	PO'S
	The student will be able to	
1	Memorize the concepts of asymmetric synthesis, formation of carbon double bond, synthetic polymers, biomolecules and bio inorganic chemistry.	1,2,4,7
2	Comprehend various organic synthesis.	1,2,4,7
3	Apply the conceptual knowledge gained in determining the mechanism involved in asymmetric synthesis, as well as reactions involving various reagents.	1,2,7
4	Analyse as to how far various reagents are useful in carrying out asymmetric synthesis and other organic reactions.	1,3,4
5	Evaluate the role of various reagents in asymmetric synthesis and other organic reactions.	1,2,6,7

UNIT – I

Asymmetric Synthesis

Topocity - Prochirality- Substrate selectivity - Diastereoselectivity and enantioselectivity-Substrate controlled methods-use of chiral substrates - examples

Auxiliary controlled methods-Use of chiral auxiliaries-Chiral enolates-alkylation of chiral imines – Stereoselective Diels-Alder reaction

Reagent controlled methods-Use of chiral reagents-Asymmetric oxidation-Sharplessepoxydation-Asymmetric reduction-Use of lithium aluminium hydride and borate reagents.

UNIT – II

Phosphorus Reagents

Formation of carbon-carbon double bonds-Functional group transformations – deoxygenation reactions-reactivity as electrophiles- conversion of alcohols to alkyl halides, Wittig reaction and nucleophiles - Corey-Winters reaction, Michaelis-Arbusov reaction-Perkow reaction and Mitsunobu reaction.

Sulphur Reagents- Sulphurylides, stabilized and non-stabilized – Preparation and reactivity Pummerer reaction – sulphonylcarbanions-Julia reaction.

UNIT – III

Synthetic Polymers

Polymer Reactions-Addition and condensation polymerization processes- Bulk, Solution, Suspension and Emulsion polymerization.

Stereospecific Polymers-Preparation and significance- classification of polymers based on physical properties-Thermoplastics-Thermosetting plastics-Fibers and elastomers- General applications.

Preparation of Polymers-Preparation of Polymers based on different types of monomers Industrial applications-olefin polymers-Diene polymers-nylons-Glyptal resins-Urea-formaldehyde, phenol-formaldehyde and melamine resins- Epoxy resins - Ion exchange resins.

UNIT – IV

Biomolecules

Peptides and Proteins-Methods of peptide synthesis, sequence determination, structure of oxytocin, proteins-classification, structure, conformation and properties. Nucleic acids- Nucleosides,

Nucleotides, DNA and RNA, structure and conformations, replication, translation of genetic material, genetic code, gene expression, gene mutation, protein synthesis.
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UNIT – V

Bioorganic Chemistry

Carbohydrates: Structure and biological functions of mucopolysaccharides, glycoproteins, and glycolipids- Role of sugars in biological recognition- Blood group substances

Enzymes: Nomenclature and classification, properties, factors affecting enzyme catalysis, enzyme inhibition- reversible and irreversible inhibition. Uses of enzymes in food drink industry and clinical laboratories.

References:

1. Advanced Organic Chemistry-Reactions, Mechanism and Structure, Jerry March, John Wiley.
2. Polymer Chemistry by V.R.Gowariker, N.V.Viswanathan, JayadevSreedhar, New Age International (P) Limited, Publishers.
3. Advanced Organic Chemistry, F.A. Carey and R.J Sundberg, Plenum.
4. Principles of Organic Synthesis, R.O.C. Norman and J.M Coxon, Blackie
5. Structure and Mechanism in Organic Chemistry C.K.Inglod, Cornell University Press.
6. Modern Synthetic Reactions, H.O. House, W.A. Benjamin.