

SEMESTER-III
Paper S-3043-B
Modern Interfaces of Organic Chemistry

Time: 3 Hrs.

M.M. 75 marks

Note: The paper will be divided into two sections.

Section-A One question with 10 parts (short answer word limit 20) spread over whole syllabus. Each part will be of 1 mark and candidate is required to attempt all the ten parts

Total 10 marks

Section-B Five questions (answer not exceeding 500 words) are from each Unit with internal choice will be asked and the candidate is required to attempt all five questions. Each question will be of 13 marks **Total 65 marks**

UNIT-I

Selective organic name reactions: Hoffmann-Loffer-Fretag reaction, chichibabin reaction, Sharpless, asymmetric epoxidation, Barton reaction, ene reactions, Stork enamine reaction, Aldol, Perkin, Stobbe, Dieckmann, Condensation, Michael addition, Mannich reaction.

UNIT-II

Disconnection approach: Elementary idea of disconnection, an introduction to synthons, synthetic equivalents, functional group one and two group C-x & C-C disconnection). Interconversions, Chemoselectivity, Diels-Alder reaction, 1,3-and 1,5 difunctionalised-unsaturated compounds, carbonyl compounds, α,β Michael reaction, Robinson annelation.

Protecting group: Principle of protection of hydroxy, amine and carbonyl groups

UNIT-III

Oxidation: Introduction, different oxidative processes, hydrocarbons (alkenes aromatic rings, activated and inactivated saturated C - H groups), alcohols, diols aldehydes, ketones, ketals and carboxylic acids, singlet oxygen, ruthenium tetroxide and Tl (III) nitrate as oxidizing agent, Prevost-Wieland react degradation

UNIT-IV

Reduction: Introduction, different reductive processes, hydrocarbons (cyclo alkanes, alkenes, conjugated system, alkynes and aromatic rings), carbonyl compounds, nitro, azo and oxime compounds, hydrogenolysis, re Meerwein -Pondrof - Verley reduction.

UNIT-V

Applications of the following in the organic synthesis: Phase transfer catalysts, polymer supported reagents, Biocatalysts, microwave and ultrasound induced reactions.

Chemistry of fullerenes: Structure bonding physical and chemical properties, compounds of fullerenes

Books Recommended:

1. Modern Synthetic Reactions, H.O. House, W.A Benjamin
2. Some Modern Methods of Organic Synthesis, W. Carruthers, Cambridge Univ. Press.
3. Principles of Organic Synthesis, R.O.C Norman and J.M. Coxon, Blackie Academic & Professional
4. Advanced Organic Chemistry, F.A Carey and R.J. Sundberg.
5. Rood's Chemistry of CoffeyCarbon. Compounds, S.
6. Organic Synthesis-Concept, Methods and Starting Materials, J. Fuhmop and G. Penzillin
7. Guide Book to Organic Synthesis, R.K. Mackie & D.M. Smith, ELBS.
8. Organic Synthesis, V.K. Ahuwalia and Renu Agarwal, Narosa
9. Synthesis, Approaches in Organic Chemistry, R.K. Bansal, Narosa
10. Advanced Organic Chemistry -Reactions, Mechanism and Structure, Jerry March, John Wiley.