

Elective Paper I (Group B)
Organic Synthesis

60 Hrs.

I Oxidation

7 hrs.

Introduction. Different oxidative processes. Hydrocarbons-alkenes, aromatic rings, saturated C-H groups (activated and unactivated). Alcohols, diols, aldehydes, ketones, ketals and carboxylic acids. Amines, hydrazines, and sulphides. Oxidations with ruthenium tetraoxide, iodobenzene diacetate and thallium (III) nitrate.

II Reduction

7 hrs.

Introduction. Different reductive processes. Hydrocarbons- alkanes, alkenes, alkynes and aromatic rings. Carbonyl compounds- aldehydes, ketones, acids and their derivatives. Epoxides. Nitro, nitroso, azo and oxime groups.

III Rearrangements

12 hrs.

General mechanistic considerations – nature of migration, migratory aptitude, memory effects. A detailed study of the following rearrangements-Pinacol-pinacolone, Wagner-Meerwein, Demjanov, Benzil-Benzilic acid, Favorskii, Arndt-Eistert synthesis, Neber, Beckmann, Hofman, Curtius, Schimdt, Baeyer-Villigr, Shapiro reaction.

IV Protecting Groups

4 hrs.

Principle of protection of alcohol, amine, carbonyl and carboxyl group

V Two Group C-C Disconnections

10 hrs.

Diels-Alder reaction, 1,3-difunctionalized compounds, α,β -unsaturated carbonyl compounds, control in carbonyl condensations, 1,5-difunctionalized compounds. Micheal addition and Robinson annelation.

VI Ring Synthesis

8 hrs.

Saturated heterocycles, synthesis of 3-, 4-, 5- and 6-membered rings, aromatic heterocycles in organic synthesis.

VII Synthesis of Some Complex molecules

12 hrs.

Application of the above in the synthesis of following compounds: Camphor, Longifoline, Cortisone, Reserpine, Vitamin D, Juvabione, Aphidicolin and Fredericamysin A.

Books Suggested:

1. Designing of Organic Synthesis, S. Warren, Wiley.
2. Modern Synthetic Reactions, H.O. House, W.A. Benzamin.
3. Some Modern Methods of Organic Synthesis, W.Carruthers, Cambridge Univ. Press
4. Advanced Organic Chemistry, Reaction Mechanism & Structure, J. March, John Wiley.
5. Principles of Organic Synthesis, R.O.C. Norman and J.M. Coxon, Blackie Academic & Professional.
6. Advanced Organic Chemistry, Part B, F.A. Carey & R.J. Sundberg, Plenum Press.