

SYLLABUS

PANJAB UNIVERSITY, CHANDIGARH

B.Sc. II (Semester-III)

ORGANIC CHEMISTRY

- Note :**
- Question paper will consist of NINE questions comprising TWO questions from each unit and ONE compulsory question of short answer type covering whole syllabus.
 - The students are required to attempt FIVE questions in all, ONE question from each unit and the Compulsory question.
 - Compulsory question carries six marks and remaining all questions carry four marks each.

UNIT-I

(8 Hrs.)

Alcohols and Phenols

Classification and nomenclature

Monohydric alcohols-Nomenclature, methods of formation by reduction of aldehydes, carboxylic acids and esters. Hydrogen bonding. Acidic nature. Reactions of alcohols.

Dihydric and Trihydric alcohols-Nomenclature, methods of formation, chemical reaction of vicinal glycols and glycerol.

Preparation of phenols; physical properties and acidic character, Comparative strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols-electrophilic aromatic substitution, acylation and carboxylation. Mechanisms of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, and Reimer-Tiemann reaction.

UNIT-II

(8 Hrs.)

Aldehydes and Ketones-I

Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1, 3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties.

UNIT-III

(8 Hr

Aldehydes and Ketones-II

Mechanisms of nucleophilic additions to carbonyl group with particular emphasis on benzaldehyde, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction, Mannich reaction.

Use of acetals as protecting group. Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones. Cannizzaro reaction, MPV, Clemmensen, Wolff-Kishner, LiAlH_4 and NaBH_4 reductions.

UNIT-IV

(8 Hr

Carboxylic Acids

Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids. Effects of substituents on acid strength. Preparation of carboxylic acids, Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Synthesis of acid chlorides, esters and amides, Reduction of carboxylic acids, Mechanism of decarboxylation.

Methods of formation and chemical reactions of halo acids. Hydroxy acids, malic, tartaric and citric acids. (Structural Formulae only).

Methods of formation and chemical reactions of unsaturated monocarboxylic acids.

Dicarboxylic acids: Methods of formation and effect of heat and dehydrating agents.