

B. PHARM PART-I

1.1 Pharmaceutical Chemistry-I (Organic Chemistry)

Theory

- 1. Stereochemistry-** Enantiomerism, Chirality, the Racemic Modification, Configuration (R&S, D&L, d&l), Sequence rules, Diastereomers, Meso-structures, conformational Isomers, Resolution of a racemic modification.
- 2. Nucleophilic Aliphatic Substitution-** Nucleophiles and leaving groups, S_N2 & S_N1 reactions, Duality of mechanism, Mechanism of Kinetics and Stereochemistry of S_N2 & S_N1 reactions, Carbonations and their rearrangements.
- 3. Elimination Reactions-** Geometric isomerism, Dehydro-halogenation of alkyl halides (1, 2 elimination), Kinetics of dehydrohalogenation, Duality of mechanism, mechanism of orientation and reactivity of E2 and E1 reactions, Elimination: E2 v/s E1: Elimination v/s Substitution.
- 4. Free Radical Substitution-** Halogenation of Alkanes upto four carbons & their relative reactivities, Mechanism & Orientation of Halogenation, Ease of abstraction of hydrogen atoms, Stability of free radicals, Ease of formation of free radicals, Transition state for halogenation, Orientation & reactivity, reactivity & selectivity, inhibitors.
- 5. Electrophilic and Free- Radical Addition-** Electrophilic addition: Mechanism, Reaction at the Carbon- Carbon double bond (addition) of hydrogen, Halogen, Hydrogen halides, Sulphuric acid & Water, Rearrangements in electrophilic addition, Orientation & reactivity, Mechanism & Orientation of free radical addition.
- 6. Conjugation & Resonance- Dienes-** The Carbon-Carbon bonds as a substituent, Free radical halogenation of alkenes: Substitution v/s addition, free radical substitution in alkenes: Orientation, reactivity and allylic rearrangements, Theory of resonance, The allyl radical as a resonance hybrid, stability radical & orbital picture of the allyl radical, Resonance stabilization of allyl radicals, The allyl cation as a resonance hybrid, Stabilization of carbonation.
- 7. Conjugate Addition.**
- 8. Aldehydes and Ketones-** Structure, physical properties, Nomenclature, Preparation and reaction of aldehydes and ketones with due emphasis on electrophilic addition reactions.
- 9. Aldol and Claisen condensation-** Acidity of hydrogens, reactions involving carbonions, Base promoted halogenation of ketones, Acid catalysed halogenation of ketones, Aldol condensation, Use of Aldol condensation, The witting reaction, Claisen condensation, Crossed Claisen condensation.
- 10. Alcohols-** Preparation, Physical properties and reaction.
- 11. Industrial sources, preparations, physical properties of Ethers, Epoxides & Alkynes.**

PRACTICALS

1. Basic Laboratory Techniques.
2. Qualitative Organic Analysis including preparation of derivatives.

Book Recommended:

1. R.T. Morrison & R.N. Boyd, "Organic Chemistry", Prentice Hall of India Pvt. Ltd., New Delhi.
2. I.L. Finar, "Organic Chemistry", Vol. I, ELBS, London.
3. R.D. Gupta, "A Textbook of Analytical Chemistry".
4. F.G. Mann & B.C. Saunders, "Practical Organic Chemistry", Longmans, Green and Co. Ltd. London.
5. B.S. Furniss, *et al.*, "Vogal's Textbook of "Practical Organic Chemistry", ELBS, London.
6. Wingrove, A.S. & Caret R.L.: "Organic Chemistry", Harper & Row Publishers, New York.
7. Pine, Handrikson *et al.*, "Organic Chemistry", McGraw Hill Book Co., New York.
8. Eliel L., "Stereochemistry of carbon compounds", Tata McGraw Hill, Bombay.
9. Singh and Kapoor, "Basic and Pharmaceutical Practical Chemistry", Vallabh Prakashan, Delhi.