**M. PH. 1.5B STEREO CHEMISTRY OF DRUGS AND REACTION MECHANISM**
**THEORY** **3 Hrs/Week**

## UNIT – I

### I. Stereochemistry of Carbon & Nitrogen Compounds:

(i) Optical Isomerism (due to Asymmetric carbon atoms)

Compounds with one asymmetric carbon atoms, compounds with two or more unequal asymmetric carbon atoms, compounds containing like asymmetric carbon atoms, compounds with asymmetric carbon atoms in branched chains.

(ii) Stereo-chemistry of Biphenyls.

(iii)Racemic modification:

Nature of modifications, formation of racemic modifications, (a) by mixing (b) by synthesis, (c) by racemization and by chemical transformation.

(iv)Configuration:

Definition, rotation, absolute configuration and relative configuration.

(v) Synthesis of optically active compounds

: Stereo selective synthesis.

(vi)Stereochemistry of Nitrogen compounds :

## UNIT – II

### II. Reaction with at least one application:

Free Radical Reaction: Kinetic characteristics of chain reaction, Structure reactivity relationship. Free radical substitution reaction, free radical addition reaction, Intramolecular free radical reaction, and Rearrangement and fragmentation reactions of free radical.

- Nucleophillic addition to carbonyl group
- Nucleophillic substitution at carbonyl group
- Nucleophillic substitution at carbonyl group with loss of C=O
- Nucleophillic substitution at saturated carbon
- Elimination reactions
- Electrophillic addition to Alkenes.
- Electrophillic Aromatic Substitution

Concerted Pericyclic Reaction**:** Electrocyclic reaction, Sigmatropic reaction, Cycloaddition reaction

## UNIT – III

**Oxidation & Reduction Reactions:** Alcohol to carbonyl using chromium (VI) Oxidants, modified chromium (VI) Oxidants, dimethyl sulfoxide oxidation, Oxidation with other metal derivatives like TPAP, $MnO_2$, Oppenauer oxidation, oxidation with silver

### III. .

- Formation of Phenols & Quinone, Conversion of Alkenes to Epoxide, Conversion of Alkenes to Diols, Bayer-villeger Oxidation, Oxidative bind cleavage using $KMnO_4$, Osmium reagents, Ruthenium reagents and chromium reagents, LTA, Sodium per-iodoate, Oxidation of alkyl or alkenyl fragments, Oxidation of sulphur , Selenium and nitrogen
- Reduction with complex metal hydrides, Alkoxy Aluminate reducing agents, Reduction with Boro hydradies, Alkoxy and alkyl Boro hydradies, Borane, aluminum hydride & derivatives, Catalytic hydrogenation, Dissolving metal reductions, Reduction with non-metallic reducing agents.

## UNIT – IV

**IV.Named Reactions :** Acyloin condensation, Allylic rearrangement, Arndt-Eistert reaction, Bayer-villeger rearrangement, Beckmann rearrangement, Bischler Napieralski synthesis, Claisen condensation , Claisen-Schmidt reaction, Dakin reaction, Curtius reaction, Dieck-Mann reaction, Diels –Alder reaction , Fittig reaction, Fries rearrangement, Gabriel synthesis, Hell-Volhard Zelinsky reaction , Knoevenagel reaction , Leuckart reaction , Mannich reaction, Perkin reaction , Pechmann reaction, Pinacol-pinacolone Rearrangement, Reformatsky reaction, Schmidt reaction, Stobbe condensation, Wagner-Meerwein rearrangement. Willgerodt reaction, Wittig reaction, Wolff rearrangement, Suzuki coupling.