

Paper-II: ORGANIC CHEMISTRY**UNIT-I****❖ AROMATICITY**

- Concept of aromaticity
 - ✓ Aromaticity of five membered
 - ✓ six membered rings
 - ✓ fused systems
- Non benzenoid aromatic compounds
 - ✓ cyclopropenyl cation
 - ✓ Cyclobutadienyldication
 - ✓ cyclopentadienyl anion-tropyllium cation
 - ✓ cyclo octatetraenyl dianion
- Metallocenes
 - ✓ Ferrocene
 - ✓ Azulenes
 - ✓ Fulvenes
 - ✓ Annulenes
 - ✓ Fullerenes
- Homo aromaticity
- Anti aromaticity

UNIT - II: HETEROCYCLIC COMPOUNDS & NATURAL PRODUCTS**❖ Heterocyclic Chemistry****➤ Synthesis and Reactions**

- Furan
- Thiophene
- Pyrrole
- Pyridine
- Quinoline
- Isoquinoline
- Indole
 - ✓ Skraup synthesis
 - ✓ Fisher indole synthesis

❖ Heterocyclic compounds more than one hetero atom**➤ Synthesis and Properties**

- Pyrazole
- Imidazole
- Oxazole
- Iso-Oxazole
- Thiazole
- Isothiazole

❖ Natural Products**➤ Importance of natural products as drugs****❖ Terpenoids**

- General methods in the structure determination of terpenes
- Isoprene rule
- Structure determination and synthesis of
 - α -terpeniol
 - β -terpiniol
 - β -carotene
 - camphor

UNIT - III: STEREOCHEMISTRY

- ❖ Molecular representations of organic molecules
 - Wedge
 - Fischer
 - Newman
 - Saw-horse formulae
 - Inter conservation
- ❖ Stereoisomerism
 - Definition
 - Classification
- ❖ Concept of Chirality and Molecular Symmetry
 - Symmetry operations
 - Recognition of symmetry elements (C_n , C_i and S_n)
 - Dissymmetric and asymmetric molecules
- ❖ Chiral structures (one and more than one chiral centres)
 - D-L and R-S nomenclature
- ❖ Diastereoisomerism
 - Threo and Erythro isomers
 - Racemic mixture
 - Racemization
 - Methods of resolution
 - Stereo specific synthesis
 - Stereo selective synthesis
- ❖ Stereochemistry of compounds containing
 - Nitrogen
 - Sulphur
 - Phosphorous
- ❖ Geometrical isomerism

- E, Z- nomenclature
- Spectral and chemical methods of determining the configuration of geometrical isomers
- Determination of configuration in
 - ✓ Aldoximes
 - ✓ ketoximes

UNIT - IV: CONFORMATIONAL ANALYSIS-I

- ❖ Conformation of acyclic molecules
 - Alkanes
 - Substituted alkanes
 - ✓ Ethane
 - ✓ 1,2-disubstituted ethane derivatives
 - ✓ Butane
 - ✓ Dihalobutane
 - ✓ Halohydrin
 - ✓ Ethylene glycol
 - ✓ Butane-2,3-diol
 - ✓ Amino alcohols
 - ✓ 1,1,2,2-tetrahalobutanes
- ❖ Klyne-Prelog terminology for conformers and torsion angles.
- ❖ Factors affecting the conformational stability and conformation equilibrium-Attractive and Repulsive interactions
- ❖ Use of Physical and Spectral methods in conformational analysis
- ❖ Conformational effects on the stability and reactivity of diastereomers in cyclic molecules-steric and stereo electronic factors-examples

UNIT-V: Conformational Analysis-II

- ❖ Conformations of monocyclic compounds
 - cyclohexane chair, boat and twist boat conformations
 - energy profile diagram
 - mono- and di-substituted cyclohexanes conformations
 - Effect of conformation on stability and reactivity in mono and disubstituted cyclohexane derivatives
- ❖ Conformations of unsaturated acyclic compounds
 - Propylene
 - 1-Butene
- ❖ Elementary treatment of fused and bridged ring systems
 - Decalines
 - Bornanes
- ❖ Conformation of sugars
- ❖ Steric strain due to unavoidable crowding