[I] Lecture Notes / Study Materials for Chemistry Honours Students (CEMA), CC-1, Module: II, CCF, NEP

1. STEREOCHEMISTRY-I

(i) Study Material-1 (Part-1, PPT-1) is available here. **Contents:** Basics of stereochemistry: Scope; History; Chiral molecules and chiral samples; Chiral and achiral molecules; Ordinary light and plane polarized light; Isomers and their importance [uploaded on 12. 08. 2023]

(ii) Study Material-3 (Part-2, PPT-2) is available here. **Contents:** Molecular symmetry and chirality: Introduction; Molecular dissymmetry; Symmetry operations and symmetry elements; Symmetry properties of a molecule; Symmetry designations [uploaded on 27. 08. 2023]

(iii) Study Material-3 (Part-3, PPT-3) is available here. **Contents:** Projection Formulae-I: Representation of three-dimensional diagram of a structure; Molecular representation and projection formulae; Designations of optical isomers; Fischer projection formula; *erythro*– and *threo*-nomenclature of compounds with two adjacent chiral centres; Limitations of *erythro*- and *threo*- nomenclature [uploaded on 03. 09. 2023]

(iv) Study Material-4 (Part-4, PPT-4) is available here. **Contents:** Projection Formulae-II: Introduction; Sawhorse projection formula; Definitions/Glossary; Newman projection formula; Flying wedge projection formula; Interconversions of projection formulae [uploaded on 06. 09. 2023]

(v) Study Material-5 (Part-5, PPT-5) is available here. **Contents:** Symmetry point groups; Symmetry operators and symmetry point groups; Point groups containing chiral molecules: (1) Point group C_n (2) Point group D_n; Point groups containing only achiral molecules: (1) Point group C_s (2) Point group S_n (3) Point group C_{nv} (4) Point group C_{nh} (5) Point group C_{nh} (6) Point group D_{nd} (7) Point group D_{nh} (8) Point group D_{nh} [uploaded on 22. 09. 2023]

(vi) Study Material-6 (Part-6, PPT-6) is available here. **Contents:** Stereoisomers: *meso*-compounds: Classification of stereoisomers based on symmetry criterion; Enantiomers and diastereomers; Isometry versus anisometry [uploaded on 10. 09. 2023]

(vii) Study Material-7 (Part-7, PPT-7) is available here. **Contents:** Chiral centres and number of stereoisomers (AB, AA, ABC and ABA Types [uploaded on 13. 09. 2023]

(viii) Study Material-8 (Part-8, PPT-8) is available here. **Contents:** Stereogenecity: Concept of stereogenecity and chirotopicity; Concept of chirotopicity and achirotopicity; Stereogenic units; Difference between stereogencity and chirotopicity; [uploaded on 08. 10. 2023]

[II] Lecture Notes / Study Materials for Chemistry Honours Students (CEMA), CC-2 (1B), CBCS

1. STEREOCHEMISTRY-I

(i) Study Material-1 (Part-1, PPT-1) is available here. **Contents:** Basics of stereochemistry: Scope; History; Chiral molecules and chiral samples; Chiral and achiral molecules; Ordinary light and plane polarized light; Isomers and their importance [uploaded on 19. 09. 2022]

(ii) Study Material-2 (Part-2, PPT-2) is available here. **Contents:** Rotation: Polarimetry and optical rotation; Specific rotation; Molar rotation; Numerical problems [uploaded on 19. 09. 2022]

(iii) Study Material-3 (Part-3, PPT-3) is available here. **Contents:** Molecular symmetry and chirality: Introduction; Molecular dissymmetry; Symmetry operations and symmetry elements; Symmetry properties of a molecule; Symmetry designations [uploaded on 27. 10. 2022]

(iv) Study Material-4 (Part-4, PPT-4) is available here. **Contents:** Symmetry point groups; Symmetry operators and symmetry point groups; Point groups containing chiral molecules: (1) Point group C_n (2) Point group D_n; Point groups containing only achiral molecules: (1) Point group C_s (2) Point group S_n (3) Point group C_{nv} (4) Point group C_{nh} (5) Point group C_{nh} (6) Point group D_{nd} (7) Point group D_{nh} (8) Point group D_{nh} [uploaded on 31. 10. 2022]

(v) Study Material-5 (Part-5, PPT-5) is available here. **Contents:** Projection Formulae-I: Representation of three-dimensional diagram of a structure; Molecular representation and projection formulae; Designations of optical isomers; Fischer projection formula; *erythro*– and *threo*-nomenclature of compounds with two adjacent chiral centres; Limitations of *erythro*- and *threo*- nomenclature [uploaded on 31. 10. 2022]

(vi) Study Material-6 (Part-6, PPT-6) is available here. **Contents:** Projection Formulae-II: Introduction; Sawhorse projection formula; Definitions/Glossary; Newman projection formula; Flying wedge projection formula; Interconversions of projection formulae [uploaded on 20. 11. 2022]

(vii) Study Material-7 (Part-7, PPT-7) is available here. **Contents:** Stereoisomers: *meso*-compounds: Classification of stereoisomers based on symmetry criterion; Enantiomers and diastereomers; Isometry versus anisometry; Chiral centres and number of stereoisomers (AB, AA, ABC and ABA Types [uploaded on 20. 11. 2022]

(viii) Study Material-8 (Part-8, PPT-8) is available here. **Contents:** Configurations-I: Configuration; Glossary; Specification of absolute configuration; Fischer's D, L-nomenclature; *R*, *S*-nomenclature [uploaded on 27. 11. 2022]

(ix) Study Material-9 (Part-9, PPT-9) is available here. **Contents:** Configuration-II: Nature of *cis*-*trans* isomerism; *E, Z*-descriptors for alkenes (C=C), conjugated dienes (C=C-C=C) and conjugated trienes (C=C-C=C-C=C); Combination of *R*/*S*– and *E*/*Z*-isomerisms; *E, Z*-descriptors for C=N system (for oximes, hydrazones and semicarbazones) and N=N system (for diazo compounds); *Syn*/*anti*-nomenclatures for aldols [uploaded on 04. 12. 2022]

(x) Study Material-10 (Part-10, PPT-10) is available here. **Contents:** Stereogenecity: Nature of stereoisomers; Concept of stereogenecity and chirotopicity; Concept of chirotopicity and achirotopicity; Stereogenic units; Difference between stereogencity and chirotopicity; Pseudoasymmetric carbon atom and pseudoasymmetry; Absolute configuration of a pseudoasymmetric centre [uploaded on 04. 12. 2022]

(xi) Study Material-11 (Part-11, PPT-11) is available here. **Contents:** Racemization: Racemic compounds/Racemic modifications; Racemization; Racemization through – (i) Radical intermediate formation (Thermal racemization), (ii) Cationic intermediate formation, (iii) Anionic intermediate formation and (iv) Reversible formation of stable inactive intermediate [uploaded on 11. 12. 2022]

(xii) Study Material-12 (Part-12, PPT-12) is available here. **Contents:** Resolution: Resolution of racemic modifications – (i) Resolution of racemic acids, (ii) Resolution of racemic bases and (iii) Resolution of racemic alcohols; Optical purity and enantiomeric excess; Invertomerism of chiral trialkylamines [uploaded on 11. 12. 2022]

2. GENERAL TREATMENT OF REACTION MECHANISM-II: REACTIVE INTERMEDIATES

(i) Study Material-13 (RI: Part-1, PPT-13) is available here. **Contents:** Reactive intermediates: Carbocations: Introduction; Carbenium and carbonium ions; Structure of carbocations; Classification of carbocations; Stability of carbocations; Generation of carbocations; Structure, generation and geometry of methanonium ion [uploaded on 05. 05. 2023.]

(ii) Study Material-14 (RI: Part-2, PPT-14) is available here. **Contents:** Reactive Intermediates: Carbanions: Introduction; Classification of carbanions; Geometry of carbanions; Carbon acids; Stability and structure of carbanions; Generation of carbanions [uploaded on 05. 05. 2023.]

(iii) Study Material-15 (RI: Part-3, PPT-15) is available here. **Contents:** Reactive Intermediates: Carbon free radicals: Introduction; Classification of free radical carbon atom; Generation of carbon free radical; Carbon free radical: Shape and stabilization; Stability of organic radicals; Radical philicity: Electrophilic and nucleophilic [uploaded on 05. 05. 2023.]

(iv) Study Material-4 (RI: Part-4, PPT-16) is available here. **Contents:** Reactive Intermediates: Carbenes: Introduction; Classification; Structures and bonding of carbenes; Effects of substituents on the nature of carbenes; Generation and structure of carbenes; Philicity of carbenes: Electrophilic and nucleophilic [uploaded on 05. 05. 2023.]

3. PREVIOUS YEARS QUESTIONS (PYQ) / MODEL QUESTIONS / ASSIGNMENTS

[A] PREVIOUS YEARS QUESTIONS (PYQ) / MODEL QUESTIONS

[B] ASSIGNMENTS

(i) ASSIGNMENT-1 on STEREOCHEMISTRY-I: Questions (uploaded on 18. 02. 2021) are available here.

(ii) ASSIGNMENT-2 on STEREOCHEMISTRY-I: Questions (uploaded on 24. 11. 2019) are available here.

(iii) ASSIGNMENT-3 on STEREOCHEMISTRY-I: Questions (uploaded on 29. 11. 2019) are available here.

[III] Lecture Notes / Study Materials for Chemistry General Students (CEMG), CC-2 / GE-2, CBCS

1. FUNDAMENTALS OF ORGANIC CHEMISTRY

(i) Study Material-1 (Part-1, PPT-1) is available here. **Contents:** Fundamentals of organic chemistry: Electron displacements along a chain (i) Inductive effect and (ii) Resonance effect [uploaded on 18. 09. 2022]

(ii) Study Material-2 (Part-2, PPT-2) is available here. **Contents:** Fundamentals of organic Chemistry: Electron displacements along a chain: Hyperconjugation; Nucleophiles; Electrophiles [uploaded on 31. 10. 2022]

(iii) Study Material-3 (Part-3, PPT-3) is available here. **Contents:** Fundamentals of organic Chemistry: Reactive intermediates: Introduction; Structure, classification, and stability: (i) Carbocations, (ii) Carbanions and (iii) Carbon Free Radicals [uploaded on 31. 10. 2022]

2. STEREOCHEMISTRY

(i) Study Material-1 (Part-1, PPT-4) is available here. **Contents:** Stereochemistry: Isomerism: Isomers; Types of isomers; Importance of isomerism [uploaded on 13. 11. 2022]

(ii) Study Material-2 (Part-2, PPT-5) is available here. **Contents:** Stereochemistry: Chirality: Introduction: Concept of chirality; Chiral and achiral molecules; Ordinary light and plane polarized light; Optical rotation and optical activity; Asymmetric carbon atom [uploaded on 20. 11. 2022]

(iii) Study Material-3 (Part-3, PPT-6) is available here. **Contents:** Stereochemistry: Projection formulae: Molecular representation; Projection formula; Fischer projection form; Newman projection formula [uploaded on 27. 11. 2022]

(iv) Study Material-4 (Part-4, PPT-7) is available here. **Contents:** Stereochemistry: Stereochemical designations; *Erythro* and *threo*-nomenclature of compounds with two adjacent chiral centres; *Meso*-compounds; Enantiomers and diastereomers [uploaded on 04. 12. 2022]

(v) Study Material-5 (Part-5, PPT-8) is available here. **Contents:** Stereochemistry: Specification of absolute configuration; Fischer's D, L-nomenclature; *R*, *S*-nomenclature [uploaded on 04. 12. 2022]

(vi) Study Material-6 (Part-6, PPT-9) is available here. **Contents:** Stereochemistry: Configurational nomenclature; Structure of alkenes: Nature of *cis-trans* isomerism; *E*, *Z*-descriptors for alkenes (C=C); *E*, *Z*-descriptors for C=N system (for oximes, hydrazones and semicarbazones) and N=N system (for diazo compounds) [uploaded on 11. 12. 2022]

3. NUCLEOPHILIC SUBSTITUTION

(i) Study Material-1 (Part-1, PPT-10) is available here. **Contents:** Nucleophilic substitution reactions: General features of nucleophilic substitution reaction; Nucleophiles; Mechanisms for nucleophilic substitution; Substitution nucleophilic bimolecular; Substitution nucleophilic unimolecular; Stereochemistry of the S_N2 reaction [uploaded on 11. 12. 2022]

4. ELIMINATION REACTIONS

(i) Study Material-1 (Part-1, PPT-11) is available here. **Contents:** Elimination Reactions: Introduction; Classification of elimination reactions; Mechanisms of elimination reactions; Elimination unimolecular (E1); Elimination bimolecular (E2); Orientation in E2: Saytzeff and Hofmann eliminations [uploaded on 11. 12. 2022]