

**M.Sc. Semester-IV**  
**Chemistry Paper-I**  
**Natural & Stereo Chemistry**  
**CHNN-701-(O)**

**Unit1: Purine & Nucleic Acid: 25% (15 Hours)**

**Purine & Nucleic Acid:** Chemistry of Uric acid, Adenine, Caffeine, Structure of Nucleotides, Nucleosides, DNA, RNA and Conformations, Protein Synthesis, Prebiotic Chemistry.

**Unit 2: Carbohydrates: 25% (15 Hours)**

Types of Naturally Occurring Sugars, Dexoy Sugars, Amino Sugar, General Method of Structure and Ring Size Determination with Reference to Starch and Cellulose, Photosynthesis of Carbohydrates.

**Unit 3: Steroids: 25% (15 Hours)**

General Biosynthesis Studies of Steroids, Chemistry of Ergosterol and Lanosterol

Androgens: Oestrone, Oestriol and Oestradiol

Gestogens: Progesterone Adreno Cortical Hormones: Cortisone, Diosgenine and its Utility in Hormone Synthesis, Transformation in Steroids Molecules.

**Unit4: Conformational Analysis: 25% (15 Hours)**

Conformation of Monocyclic System:

**Cyclo Propane:** Cyclopropane 1,2 Dicarboxylic Acid, 2-OH Methyl Cyclo Propane Dicarboxylic acid,

**Cyclo Hexane:** 1,3 Ditertiary Butyl Cyclohexane, 4-OH Cyclo Hexane Carboxylic Acid, Cyclohexane 1,2 di Carboxylic Acid.

**Cyclo Hexanone:** 2-Br Cyclo Hexanone, 2-Br 4,4-dimethyl Cyclo Hexanone, Cyclo Hexanol, Hexa-Chloro Cyclo Hexane, Conformation of Di substituted Cyclohexanones,

**Bridge ring system:** Bicyclic(1,1,1) pentane and Bicyclo (2,1,1) hexane, Bicyclo (2,2,1) Heptane and Bicyclo (2,2,2) Octane.

**Fused Ring System :** Per hydro Anthracene and Per Hydro Phenanthrene.

### **Basic Text & Reference Books:**

1. Natural Products by O.P. Agarwal, Vol. 1 & 2
2. Organic Chemistry of Natural Products by G.R. Chatwal, Vol. 1 & 2
3. NMR Spectroscopy : Basic Principles, Concepts and Applications in Chemistry , 3<sup>rd</sup> edition by Harald Gunther
4. Spectroscopic Identification of Organic Compounds, R. M. Silverstein and F. X. Webster, 6<sup>th</sup> edition (John Wiley & Sons)
5. Introduction to Spectroscopy, D. L. Pavia, G. M. Lampman and G. S. Kriz, 3<sup>rd</sup> edition (Thomson Brooks/Cole)
6. Spectroscopic Methods in Organic Chemistry, D. H. Williams and I. Fleming, 4<sup>th</sup> edition (Mcgraw – Hill Book Company)
7. Organic Spectroscopy, William Kemp, 3<sup>rd</sup> edition (Palgrave)
8. Organic Spectroscopy – Principles and Applications, Jag Mohan, 2<sup>nd</sup> edition (Narosa Publishing House)
9. Spectroscopy of Organic Compounds, P. S. Kalsi, 5<sup>th</sup> edition (New Age International Publishers)
10. Stereochemistry: Conformation and Mechanism, By P.S. Kalsi, 6<sup>th</sup> edition, New Age International (P) Ltd., Publishers (2005).
11. Stereochemistry and Mechanism through solved problems, By P.S. Kalsi, Wiley Eastern Ltd. (1994).
12. Stereochemistry of organic compounds, By D. Nasipuri, 2<sup>nd</sup> Edition, New Age International (P) ltd., Publishers (1994).
13. Stereochemistry of Carbon Compounds, By E.L. Eliel, Tata McGraw-Hill Pub. Co. Ltd. (1962).
14. Organic Chemistry, By J. Clayden, N. Greeves, S. Warren and P. Wothers, Oxford Uni. Press, N.Y. (2001).
15. Elementary Organic Spectroscopy: Principles and Chemical Applications (revised edition), Y. R. Sharma (S. Chand Publishing)