**ANDHRA UNIVERSITY**

**SEMESTER – I SYLLABUS**

**M.SC., CHEMISTRY ( PREVIOUS )**

**( For the batch during the academic year 2020-2021 )**

**PAPER-III: ORGANIC CHEMISTRY**

UNIT - I

**Aliphatic Nucleophilic Substitutions**: The SN2, SN1, SNi and SET mechanisms. Substitution reactions of ambident nucleophiles, anchimeric assistance, the neighbouring group mechanism: neighbouring group participation by O, N, S, halogens, aryl groups, alkyl and cycloalkyl groups in nucleophilic substitution reactions. Sigma, Pi bond participation in acylic and bicyclic systems (Non- classic carbocations). Nucleophilic Substitution at allylic, trigonal and Vinylic carbons. Effect of substrate, attacking nucleophile, leaving group and reaction medium.

**Aliphatic Electrophilic Substitutions**: SE1 SE2 and SEi mechanisms. Reactivity- effects ofsubstrate, leaving group and solvent. Reactions- hydrogen exchange, migration of doublebonds, halogenation of aldehydes, ketones, carboxylic acids, acyl halides, sulphoxides and sulphones.

A) UNIT-II

**Stereochemistry and conformational analysis :** Optical Isomerism: optical activity, molecular dissymmetry and chirality - elements ofsymmetry. Fisher's projection D,L. and R,S. configurations - relative and absolute configurations optical isomerism due to asymmetric carbon atoms - optical isomerism in biphenyls, allenes and spirans- optical isomerism of nitrogenous compounds, racemisation and resolution.

Geometrical isomerism: E, Z -configurations, properties of geometrical isomers. Conformational analysis: Conformations of acyclic molecules –alkanes and substituted alkanes- compounds having intramolecular hydrogen bonding. Conformations of cyclohexane, mono and disubstituted cyclohexanes and decalins, effect of conformations on reactivity.

UNIT-III

**Chemistry of heterocyclic compounds :** Structure, reactivity and synthesis of reduced three membered Heterocycles: (a) Oxirane:Sharpless method, Shi epoxidation, Jacobsen epoxidation, etc, (b) Aziridine; four memberedHeterocycles: (b) Oxetane (b) Azetine; five membered Heterocycles: (a) Pyrrole: Paal Knorr,Hantzsch Methods, etc, (b) Thiophene: Paal Knorr, Hinsberg method, etc. (c) Furan: PaalKnorr, Fiest-Benary, Industrial Method, etc.; (d) Pyrazole, Imidazole, Oxazole, Thiazole; Sixmembered Heterocycles: (a) Pyridine, Pyridazine, pyrimidine and Pyrazine; Aromaticheterocyclics: a) Indole: Fischer indole synthesis, Bischler synthesis, Madelung synthesis,Domino and cascade methods of indole synthesis, (b) Quinoline and Isoquinoline, (c)Coumarins and Chromones

UNIT-IV

**Chemistry of Natural Products**

**A) Terpenoids: -** Occurrence, Isolation, isoprene rule, structure elucidation and synthesis of α- Terpineol and α- pinene

**B) Steroids:-** Nomenclature of steroids, structure elucidation and synthesis and

stereochemistry of cholesterol and progesterone

C) **Lipids:-** Classification, chemistry, properties and function-free fatty acids, triglycerides, phospholipids, glycolipids & waxes conjugated lipids-lipoproteins

**Reference Books**

1. Advanced Organic Chemistry: Reactions Mechani;sms and Structure by Jerry March,

 Mc.Graw Hill and Kogakush.

2. Organic Chemistry Vol. I (Sixth Ed.) and Vol. II (Fifth Ed.) by I L Finar ELBS.

3. Organic Chemistry (fifth Ed., ) by Morrison and Boyd, PHI, India.

4. Organic Chemistry (fifth edition) by Francis A. Carey Tata Mc Graw Hill publishing

 Company Limited, New Delhi.

5. Stereochemistry of Organic compounds by Ernest L. Eliel, Samuel H. Wilen

6. Chemistry of natural products by S. V. Bhat, B. A. Nagasampangi and M. Sivakumar

 Narosa Publishing House, 6th reprint 2010

 **Note : The above highlighted unit shall be studied under self study cum assignment mode by the students and considered for mid-II examination**