ST.JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

II SEMESTER **CHEMISTRY** TIME:4HRS/WEEK

CH 2202 (3) **ORGANIC & GENERAL CHEMISTRY** MAX.MARKS:100

w.e.f. 20-21 admitted batch-“20AH” **SYLLABUS**

**OBJECTIVES:**

**COURSE OUTCOMES:** At end of the course, the student will be able to;

* Understand and explain the differential behaviour of organic compounds based on fundamental concept learnt.
* Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
* Learn and identify many organic reaction mechanism including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.
* Correlate and describe the stereo chemical properties of organic compounds and reactions.

**ORGANIC CHEMISTRY:**

**UNIT- l: RECAPITULATION OF BASICS OF ORGANIC CHEMISTRY**

**CARBON-CARBON SIGMA BONDS (ALKANES AND CYCLOALKANES)**

General methods of preparation of alkanes- Wurtz and WurtzFittig reaction, Corey House synthesis, physical and chemical properties of alkanes, Isomerism and its effect on properties, Free radical substitutions ; Halogenation, Conformational analysis of alkanes (Conformations, relative stability and energy diagrams of Ethane, Propane and butane). General molecular formulae of cycloalkanes and relative stability, Bayer strain theory.

Carbon-Carbon pi Bonds (Alkenes and Alkynes)

General methods of preparation, physical and chemical properties. Mechanism of E1, E2, E1cb reactions, Saytzeff and Hoffmann eliminations,Electrophilic Additions, mechanism (Marownokoff/Antimakownikoff addition) with suitable examples,,*syn and* the *anti-*addition; addition of H2, X2, HX. Diels Alder reaction 1,2- and 1,4- addition reactions in conjugated dienes.

Reactions of alkynes;

acidity. electrophilic and nucleophilic additions.

**UNIT- ll: BENZENE AND ITS REACTIVITY**

Concept of aromaticity ,Huckle’s rule-application to Benzenoid (Benzene, Naphthalene) and Non-Benzenoid compounds (cyclopropenylcation, cyclopentadienyl anion and tropyliumcation)

Reactions – General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel – Craft’s alkylation and acylation. Orientation of aromatic substitution – ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO2 and phenoic). Orientation of (i) Amino, methoxy and methyl groups (ii) Caboxyl, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens

(Expained by taking minimum of one example from each type)

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**UNIT- III: CHEMISTRY OF HALOGENATED HYDROCARBONS**

Alkylhalides: Methods of preparation and properties, nucleophilic substitution reactions-SN1,SN2 and SNi mechanisms with stereochemical aspects and effect of solvent etc.;nucleophilic substitution vs elimination, Williamson’s synthesis.

Arylhalides: Preparation ( including preparation from diazonium salts) and properties, nucleophilic aromatic substitutions;SNAr,Benzyne mechanism.

Relative reactivity of alkyl,allyl,benzyl,vinyl and aryl halides towards nucleophilic substitution reactions.

**GENERAL CHEMISTRY**

**UNIT- IV: SURFACE CHEMISTRY**

* Colloids- Coagulation of colloids- Hardy-Schulze rule. Stability of colloids, Protection of colloids, Gold number.
* Adsorption-physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption.

**UNIT- V: CHEMICAL BONDING**

* Valence bond theory, hybridization, VB theory as applied to ClF3,Ni(CO)4, Molecular orbital theory- LCAO method, construction of M.O diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N2, O2, CO and NO)
* **HSAB:** Pearson’s concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.

**LIST OF REFERENCE BOOKS:**

1. **TEXT BOOK OF ORGANIC CHEMISTRY**

Morrison,R.N.& Boyd, R. N. Organic Chemistry, Dorling Kindersley (india) Pvt, Ltd.

2. **TEXT BOOK OF ORGANIC CHEMISTRY** (Pearson Education).

Finar,I. L. Organic Chemistry (Volume 1), Dorling Kindersley(india)Pvt. Ltd.(Pearson Education)

3. **TEXT BOOK OF ORGANIC CHEMISTRY** Finar,I. L. Organic Chemistry(Volume2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (india) Pvt. Ltd. (Pearson Education).

4. Stereo chemistry by Eliel, E. L. &Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994. Kalsi.P. s. Stereochemistry Conformation and Mechanism; New Age International,2005.

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ST.JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

II SEMESTER **CHEMISTRY** TIME2HRS/WEEK

CH 2252 (2) **ORGANIC & GENERAL CHEMISTRY** MAX.MARKS:50 20-21 admitted batch-“20AH” **PRACTICAL SYLLABUS – I B**

**COURSE OUTCOMES:** At the end of the course, the student will be able to;

1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory.

2. Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic equilibrium.

3. Learn and identify the concepts of a standard solutions, primary and secondary standards.

4. Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

**VOLUMETRIC ANALYSIS:**

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.

2. Determination of Fe (II) using KMnO4 with oxalic acid as primary standard.

3. Determination of Cu (II) using Na2S2O3 with K2Cr2O7 as primary standard.

4. Estimation of water of crystallization in Mohr’s salt by titrating with KmnO4

**REFERENCE BOOKS:**

1. Vogel’s Text Book of Quantitative Inorganic Analysis, IV Edition J.Bassett, R.C.Denny, G.H.Jeffery, J.Mendhan ELBS/Longman, England.

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