GOVT.DEGREE COLLEGE

RAJAMPETA

DEPARTMENT OF CHEMISTRY

CBCS CHEMISTRY SYLLUBUS

I SEMESTER

(w.e.f. 2015-16)

Affiliated

to

YOGI VEMNA UNIVERSITY

KADAPA

SEMESTER – I

Paper I - Inorganic & Organic Chemistry 60hrs (4h/w)

INORGANIC CHEMISTRY 30 hrs (2h / w)

UNIT –I

p-block elements –I **15h**

Group-13: Synthesis and structure of diborane and higher boranes (B_4H_{10} and B_5H_9**),** boron-nitrogen compounds ($B_3N_3H_6$ and BN)

Group - 14: Preparation and applications of silanes and silicones. Group - 15: Preparation and reactions of hydrazine, hydroxylamine.

UNIT-II

1. p-block elements -II **8h**

Group - 16: Classifications of oxides based on (i) Chemical behaviour and (ii) Oxygen content.

Group-17: Inter halogen compounds and pseudo halogens.

2. Organometallic Chemistry **7h**

Definition - classification of Organometallic compounds - nomenclature, preparation, properties and applications of alkyls of Li and Mg.

ORGANIC CHEMISTRY 30hrs (2h /w)

UNIT-III

Structural theory in Organic Chemistry **10 h** Types of bond fission type of organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like H_2O, NH_3 & $AlCl_3$).

Inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance or Mesomeric effect, application to (a) acidity of phenol, and (b) acidity of carboxylic acids. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes,

Types of Organic reactions : Addition - electrophilic, nucleophilic and free radical. Substitution - electrophilic, nucleophilic and free radical reactions. Elimination-Examples.

UNIT-IV

l. **Acyclic Hydrocarbons** **6 h**

Alkenes - Addition of halogen. Addition of HX, Markonikov's rule (with mechanism), addition of H_2O, HOX, H_2SO_4 and addition of HBr in the presence of peroxide (anti - Markonikov's addition). Dienes - Types of dienes, reactions of conjugated dienes - 1,2 and 1,4 addition of HBr to 1,3 - butadiene and Diel's - Alder reaction.

Alkynes – Terminal and non terminal Alynes, Properties; Acidity of acetylenic hydrogen (formation of Metal acetylides). Electrophilic addition of X_2, HX, H_2O (Tautomerism), Oxidation with $KMnO_4$, OsO_4, Metal Ammonia reduction and Polymerisation reaction of acetylene.

2. **Alicyclic hydrocarbons (Cycloalkanes)** **4 h**

Nomenclature, Preparation by Freunds method, Wislicenus method. Properties - Stability of cycloalkanes - Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory.

UNIT-V

Benzene and its reactivity **10h**

Concept of aromaticity - aromaticity (definition), Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation), Molecular structure of Benzenebased on modern concepts (VBT and MOT).

Reactions - Mechanism of nitration, Friedel Craft's alkylation and acylation. Orientation of aromatic substitution - Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (i) Amino, methoxy and methyl groups

(ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens

List of Reference Books

1. Inorganic Chemistry by J.E.Huheey
2. Basic Inorganic Chemistry by Cotton and Wilkinson
3.A textbook of qualitative inorganic analysis by A.I. Vogel
4. Organic Chemistry by Morrisson and Boyd
5. A Text Book of Organic chemistry by I L Finar Vol I
6. Concise Inorganic Chemistry by J.D.Lee

LABORATORY COURSE-I **30** hrs (2 h / w)

Practical-I Simple Salt Analysis

(At the end of Semester-I)

Qualitative inorganic analysis

Analysis of simple salt containing one anion and cation from the following

Anions: Carbonate,sulphate,chloride,bromide, acetate, nitrate, borate, phosphate.

cations: Lead,copper, iron, aluminum, zinc, manganese, nickel, calcium, strontium, barium, potassium and ammonium.