

VEER NARMAD SOTH GUJARAT UNIVERSITY, SURAT

Syllabus on 2019

For

F. Y. B. Sc. Semester- I

Paper-II

(Organic Chemistry)

UNIT I:(A) Alkanes and Cycloalkanes: 10 Hrs.

Alkanes : IUPAC nomenclature of branched and unbranched alkanes, Alkyl group, Classification of carbon atoms in alkanes. Isomerism in Alkanes, sources, methods of formation special reference to **Wurtz reaction, Kolbe reaction and Corey-House reaction and decarboxylation of carboxylic acids**). Physical properties and chemical reactions of alkanes. Mechanism of free radical halogenations of alkanes: orientation, reactivity & selectivity.

(B) Cycloalkanes : Nomenclature, methods of formation, chemical reactions, Baeyer's strain theory and its limitations. Ring strain in small rings (Cyclo propane and cyclo butane), Theory of strainless ring. The case of cyclo propane ring: banana bonds

UNIT II : Stereochemistry 10 Hrs.

- (a) Isomerism :- Optical activity , Chiral and Achiral molecules,
- (b) Optical isomerism of tartaric acid, Enantiomers, diastereomers(Threo&Erythro), Meso compounds Resolution of Racemates, inversion retention and racemization .
- (c) Geometrical Isomerism: Alkene derivative & oximes E & Z system of nomenclature.
- (d) Relative and absolute configuration, sequence rules. D & L and R & S system of nomenclature.

UNIT III (A) Heterocyclic compounds : 5 Hrs.

Nomenclature aromaticity , and synthesis properties uses and canonical structures of Pyrrol, Benzopyrol Furan , Benzofuran, Thiophene, Benzothiophene.

(B) PolynuclearHydrocarbons : 3 Hrs.

Classification aromaticity and Industrial preparation, , properties, uses and canonical structures of Napthalene , Anthracene and Phenanthrene.

(C) Organic Qualitative Analysis 2 Hrs.

(I) Elemental Analysis (Lassaign's Test with equation)

(II) Solubility of Organic Compound (Ref. : Vogel's qualitative organic analysis)

Chemical Methods : Solubility in NaHCO_3 , NaOH and HCl , Acid, Base and Phenol and amphoteric compounds (Sulphanilic acid and Anthranilic acid)

Syllabus on 2019

For

F. Y. B. Sc. Semester- II

Paper-II

(Organic Chemistry)

UNIT: I: Reaction mechanism :10 Hrs.

- (a) Homolytic and Heterolytic fission free radicals carbonium ions (carbocations) and carbanions reactive intermediates carbenes , arynes and nitrenes.
- (b) Types of reagents, electrophiles nucleophiles .
- (c) Eletromeric, inductive, conjugative effect.
- (d) Types of reactions : Addition, substitution, elimination, rearrangments. Addition, and Substitution with respect to electrophilic and nucleophilic reaction, SN^1 & SN^2
- (e) Mechanism of (i) addition reaction to alkenes and dienes (ii) substitution in benzene Ring, nitration ,sulfonation, alkylation , acylation, halogenation., cyanohydrin formation andacetal formation,
- (f) Mechanism of Perkin reaction, Benzoin Condensation andCannizaro's reaction

UNIT II: (A) Empirical formula, Molecular formula, and Structural formula: 4 Hrs.

Determination of empirical formula and its relation with molecular formula
determination of molecular weight of (a) Organic acid by Silver salt method and
(b) organic base by chloroplatinate method and its limitations .
Numerical example.

(B) Carbohydrates:

6 Hrs.

Modern definition of carbohydrates, classification of carbohydrates, function of Carbohydrates, optical isomers, Diastereoisomers, enantiomers racimates of Glucose and Fructose, Structure of Glucose and Fructose isomers, mutarotation, glucoside linkage (Pyranose and Furanose) D & L isomers of Glucose and Fructose, derivatives of Monosaccharide, step up and stepdown synthesis, kilyani synthesis, conversion of glucose to Fructose and conversion of Fructose to glucose.

UNIT – III (A) Alkenes, dienes and alkynes : 10Hrs.

- (a) Alkenes : Nomenclature, method of preparation, properties and uses of ethylene and propylene Morkwonikoffs rule and Satytzeff rule, polymerization of ethylene styrene and vinyl chloride. Alkenes. Reactions: Hydroboration, Oxidation, Epoxidation, Ozonolysis, Oxymercuration, Hydroxylation, Hydrohalogenation, Dehydrohalogenations, Hydration.
- (b) Dienes : Nomenclature, classification of dienes methods of formation of Butadiene chemical reactions 1,2 and 1,4 additions, Diel's – Alder reaction.
- (c) Alkynes : Nomenclature , methods of formation, chemical reactions: Hydroboration, Oxidation, metal ammonia reduction, oxidation, polymerization. Electrophilic and nucleophilic addition reactions of acetylene.

Reference Books

- (1) Organic chemistry vol.I and vol. II by I.L.Finar (Longman group)
- (2) Organic chemistry by P.L.Soni
- (3) Organic chemistry by R.T.Morrison and Boyd Prentice Hall India.
- (4) Organic chemistry by B.K. Sharma.
- (5) Organic chemistry by Bahland Bahl
- (6) Organic reaction mechanism by Mukharji and singh
- (7) Fundamentals of Organic chemistry by Soloman, John Wiely