ORGAINC CHEMISTRY SYLLABUS

1 Purification and characteristics of organic compounds
Purification Crystallization, sublimation, distillation, differential extraction, and chromatography principles and their applications
Qualitative analysis Detection of nitrogen, sulphur, phosphorus, and halogens.
Quantitative analysis Estimation of carbon, hydrogen, nitrogen, halogens, sulphur, phosphorus, Calculations of empirical formula and molecular formulae, Numerical problems in organic quantitative analysis.

2 Some basic principle of organic chemistry
Tetravalency of carbon: Shapes of simple molecules, hybridization (s and p),
Classification of organic compounds based on functional groups and those containing halogens, oxygen, nitrogen, and sulphur, Homologous series, Isomerism structural and stereoisomerism.
Nomenclature Covalent bond fission- Homolytic and heterolytic, free radicals, carbocations, and carbanions, stability of carbocations and free radicals, electrophiles, and nucleophilesInductive effect, electromeric effect, resonance, and hyperconjugation, Substitution, addition, elimination, and rearrangement.

3 Hydrocarbons
nomenclature, general methods of preparation, properties, and reactions

Alkanes Conformations- Sawhorse and Newman projections of ethane, Mechanism of halogenation of alkanes
Alkenes Geometrical isomerism, Mechanism of electrophilic addition- addition of hydrogen, halogens, water, hydrogen halides (Markownikoffs and peroxide effect), Ozonolysis and polymerization
Alkynes Acidic character, Addition of hydrogen, halogens, water and hydrogen halides, Polymerization
Aromatic hydrocarbons Nomenclature, benzene: structure and aromaticity, Mechanism of electrophilic substitution, halogenation, nitration Friedel - Crafts, alkylation and acylation, directive influence of the functional group in monosubstituted benzene

4 Organic compounds containing halogens
General methods of preparation, properties, and reactions, Nature of C-X bond,
Mechanisms of substitution reactions, Uses, Environmental effects of chloroform, iodoform freons, and DDT

5 Organic compounds containing oxygen
Alcohols Identification of primary, secondary, and tertiary alcohols, mechanism of dehydration
Phenols Acidic nature, electrophilic substitution reactions: halogenation. nitration and sulphonation. Reimer - Tiemann reaction
Ethers Structure
Aldehyde and ketones Nature of carbonyl group, Nucleophilic addition to >C=O group, relative reactivities ofaldehydes and ketones, Important reactions such as Nucleophilic addition reactions, Grignard reagent, oxidation, reduction ,the acidity of hydrogen, aldol condensation, Cannizzaro reaction. Haloform reaction, Chemical tests to distinguish between aldehydes and Ketones
Carboxylic acid Acidic strength and factor affecting it.

6 Organic compound containing nitrogen
General methods of preparation, Properties, reactions, and their uses
Amine
Nomenclature, classification structure, basic character and identification of primary, secondary, and tertiary amines and their basic character, Importance in synthetic organic chemistry

7 Polymers
General introduction and classification of polymers, general methods of polymerization,

Addition and condensation, copolymerization, Natural and synthetic, rubber and vulcanization, some important polymers with emphasis on their monomers and uses, polythene, nylon, polyester and bakelite

8 Biomolecules
General introduction and importance of biomolecules,
CARBOHYDRATES Classification, aldoses and ketoses, monosaccharides (glucose and fructose) and constituent monosaccharides of oligosaccharides (sucrose, lactose, and maltose),
PROTEINS Elementary Idea of a-amino acids, peptide bond, polypeptides, primary, secondary, tertiary, and quaternary structure (qualitative idea only), denaturation of proteins, enzymes,
VITAMINS functions, Classification and Nucleic acid Chemical constitution of DNA and RNA, Biological functions of nucleic acids

9 Chemistry in everyday life
Chemicals in Medicines-Analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, anti-fertility drugs, antibiotics, antacids.
Antihistamines and their meaning and common examples Chemicals in food artificial sweetening examples Soap and detergents and their cleansing agents