

rejection of a result, errors in a derived result, methods of checking the accuracy of analysis, significant figures, computation values.

Book Recommended:

1. Text Book of Quantitative Inorganic Analysis: A. Vogel (Chapter- I, II and XXIII).
2. Text Book of Quantitative Inorganic Analysis: I. M. Kolthoff and E. R. Sandell.
3. Concise Inorganic Chemistry: J. D. Lee.
4. General Inorganic Chemistry: J. A. Duffy.
5. Principle of Inorganic Chemistry: B. R. Puri and L. R. Sharma.
6. Basic Inorganic Chemistry: Cotton and Wilkinson and Gaus, Wiley.
7. Inorganic Chemistry (Hindi ed.): Suresh Ameta, A. Sharma and M. Mehta, Himanshu Pub.

PAPER II
ORGANIC CHEMISTRY

Time-3 Hrs.

M.M. 50

NOTE: The paper will be divided into THREE sections.

Section-A Ten questions (short type answer) two from each Unit will be asked. Each question will be of half mark and the candidates are required to attempt all questions.

Total 5 marks

Section-B Five questions (answer not exceeding 250 words) one from each Unit with internal choice will be asked and the candidates are required to attempt all questions. Each question will be of 5 marks.

Total 25 marks

Section-C Four questions may be in parts covering all the five Units (answer not exceeding 500 words) will be asked. The candidates are required to attempt any **TWO** questions. Each question will be of 10 marks.

Total 20 marks

Unit-I

Alcohols and Epoxides

Unsaturated alcohols- Vinyl and Allyl alcohol

Dihydric alcohol - Nomenclature, method of formation and chemical reactions of vicinal glycols.

Pinacol- Pinacolone rearrangement.

Trihydric alcohols - Formation and chemical reactions of glycerol.

Epoxides - Synthesis and reactions of epoxides, orientation of epoxide ring opening.

Phenols - Nomenclature, structure and bonding, preparation of phenols, physical properties and acidic character, comparative acidic strength of alcohols and phenols, resonance stabilization of phenoxide ion.

Reactions of phenols - Electrophilic aromatic substitution, acylation and carboxylation, Mechanism of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Hauben-Hoesch reaction, Lederer Manasse reaction and Reimer-Tiemann reaction.

Unit II

Aldehydes and Ketones - Synthesis, chemical and physical properties of aromatic aldehydes and ketones, mechanism of nucleophilic addition to carbonyl group with particular emphasis on Benzoin, Aldol, Perkin and Knoevenagel condensations, condensation with ammonia and its derivatives, Wittig reaction, Mannich reaction.

Use of acetals as protecting group. Oxidation of aldehydes, Baeyer- Villiger oxidation of ketones, Cannizzaro reaction, MPV, Clemmenson, Wolff-Kishner, LiAlH_4 and NaBH_4 reductions, Halogenation of enolizable ketones.

Introduction to α, β - unsaturated aldehydes and ketones.

Unit III

Carboxylic Acids and their derivatives - Nomenclature, structure and bonding, acidity of carboxylic acids, effects of substituents on acid strength, mechanism of carboxylation, Methods of formation, physical properties and chemical reactions of dicarboxylic acids oxalic, succinic and phthalic acid.

Substituted Acids - Methods of formation & chemical reactions of halo acids, hydroxy acids, malic, tartaric, citric and salicylic acids.

Unsaturated Acids - Acrylic and cinnamic acid.

Introduction to acids derivatives - Preparation, properties and uses of acid halides, amides, anhydrides and esters. Interconversion of acid derivatives by nucleophilic acyl substitution. Mechanism of HVZ reaction, Hofmann - bromamide reaction and ester hydrolysis.

UNIT - IV

Organic compounds of Nitrogen: - Preparation & chemical reactions of nitroarenes. Reactivity of nitro substituted arenes.

Aromatic amines, classification, preparation, properties and uses of primary amino compounds -aniline, acetanilide, nitroanilines.

Secondary amino compounds- diphenylamine and N-methylaniline

Tertiary amino compounds- Triphenylamine and N,N-dimethylaniline

Aryl alkyl amine- Benzylamine

Basic strength of amines- similarities and differences between aliphatic and aromatic amines.

Diazonium salt- formation, properties and synthetic uses of benzene diazonium salts, Diazo coupling & its mechanism.

Organic Sulphur Compounds: Preparation and properties of thiols, sulphonic acid, sulphonyl chloride, saccharides, chloramine - T, dichloramine-T and sulphonamides.

UNIT V

Polynuclear Hydrocarbons - Nomenclature of naphthalene and anthracene derivatives, preparation and properties of naphthalene, anthracene, naphthol, naphthylamine, naphthaquinone and anthraquinone.

Mechanism and orientation of electrophilic substitution reaction in naphthalene and anthracene.

Organometallic Compounds - Preparation, properties and synthetic uses of organo lithium and organo zinc compounds.

Books Recommended

1. A Text Book of Organic Chemistry: K. S. Tiwari, S. N. Mehrotra and N. K. Vishnoi.
2. Modern Principles of Organic Chemistry: M. K. Jain & S. C. Sharma
3. A Text Book of Organic Chemistry: (Vol. I & II) O. P. Agarwal
4. A Text Book of Organic Chemistry: B. S. Bahl and Arun Bahl.
5. A Text Book of Organic Chemistry: P. L. Soni.
6. Organic Chemistry: (Vol. I, II & III) S. M. Mukherji, S. P. Singh and R.P. Kapoor.
7. Organic Chemistry (Hindi Ed.) : Suresh Ameta, P. B. Punjabi and B. K Sharma, Himanshu Pub.