

SEMESTER-I
2. Organic chemistry

Time: 3 Hrs.

M.M. 100 marks

Note: The paper will be divided into two sections.

Section-A M.C.Q.50 (10 from each section)
marks

Total-50

Section-B: Two questions are from each unit will be asked with internal choice and the candidate is required to attempt five questions.
marks

Total-50

Unit I

Structure and bonding : localized and delocalized chemical bond, Vander walls interaction, charge transfer complexes, Resonance, hyper conjugation, Aromaticity, electromeric, inductive and field effects, hydrogen bonding, types of organic reactions, energy consideration, brief idea of reactive intermediates (formation and stability), neighboring group participation.

Unit II

Reagents in organic synthesis: use of the following reagents in organic synthesis and functional group transformation, Gilman's reagent, LDA, DCC, 1,3-dithiane, trimethylsilyl iodide, tributyltin hydride, DDQ, Baker yeast, Petersons synthesis, Merrifield resins, Wilkinsons catalyst, selenium dioxide, Osmium tetroxide, Lithium diisopropyl amide, Phase transfer catalyst, crown ethers.

Unit III

Addition to carbon – carbon multiple bond : mechanistic and stereochemical aspects of addition reaction involving electrophiles, nucleophiles and free radicals. region and chemo selectivity, orientation and reactivity.

Addition to carbon – hetero multiple bonds . Mechanism of metal hydride reduction of saturated and unsaturated carbonyl compounds, acids, esters and nitriles.

Unit IV

Free radical reaction: Type of free radical reactions. Free radical substitution mechanism, neighbouring group assistance, reactivity for aliphatic and aromatic substrate at a bridgehead, reactivity in the attacking radicals, effects of solvents on the reactivity, allylic halogenation (NBS), oxidation of aldehydes to carboxylic acids, auto-oxidation, coupling of alkynes and arylation of aromatic compounds by diazonium salts, Sandmeyer reaction, free radical rearrangement, Hunsdiecker reaction.

Unit V

Green chemistry: principles, design for polymer degradation, polymers from renewable resources, and polymer recycling, industrial case studies in context with green chemistry.
Photochemistry: cis-trans isomerisation, Paterno – Buchi reaction, Norrish type I and II reaction, photo reduction of ketones, dimethane rearrangement, photochemistry of alkanes.

Recommended Books:

1. Organic reaction mechanism. K. Ahluwalia
2. Reaction mechanism in organic chemistry: S. M. Mukherji, S.P. Singh

