

SYLLABUS

Panjab University, Chandigarh

Semester-V

Paper-XVIII : ORGANIC CHEMISTRY-A

Time : 3 Hrs.

Max. Marks : 22 + 3

30 Hrs. (2 Hrs./Week)

3 Periods/Week

UNIT-I

(7 Hrs.)

Electromagnetic Spectrum : Absorption Spectra-I :

Ultraviolet (UV) absorption spectroscopy- Absorption laws (Beer-Lambert Law), molar absorptivity, presentation and analysis of UV spectra, type of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones.

Woodward Fieser Rules and their applications in calculating maximum values of conjugated alkenes (cyclic as well as acyclic) and conjugated carbonyl compounds.

UNIT-II

(7 Hrs.)

Electromagnetic Spectrum : Absorption Spectra-II :

Infrared (IR) absorption spectroscopy- Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds.

Problems pertaining to the structure elucidation of simple organic compounds using UV, IR and PMR spectroscopic techniques.

UNIT-III

(8 Hrs.)

Spectroscopy :

Nuclear magnetic resonance (NMR) spectroscopy.

Proton magnetic resonance (^1H NMR) spectroscopy, nuclear shielding and deshielding, chemical shift and molecular structure, spin-spin splitting and coupling constants, area of signals, interpretation of PMR spectra of simple organic molecules such as ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromoethane, ethyl acetate, toluene and acetophenone.

UNIT-IV

(8 Hrs.)

Carbohydrates :

Classification and nomenclature. Monosaccharides, mechanism of osazone formation, interconversion of glucose and fructose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose into mannose. Formation of glycosides, ethers and esters. Determination of ring size of monosaccharides. Cyclic structure of D (+) - glucose. Mechanism of mutarotation.

Structure of ribose and deoxyribose.

An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.

Instructions for paper setters and candidates :

- (i) Examiner will set total of NINE questions comprising TWO questions from each unit and ONE compulsory question of short answer type covering whole syllabi.
- (ii) The students are required to attempt FIVE questions in all, ONE question from each unit and the Compulsory question.
- (iii) Compulsory question carries six marks and remaining all questions carry four marks each.