PAPER–II
PHOTOCHEMISTRY AND SUPRAMOLECULAR CHEMISTRY

Time: 3 Hrs. **M.M. 100**

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 one mark and the candidates are required to attempt all questions. **Total 10 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 10 marks.

Total 50 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 20 marks.

Total 40 marks

UNIT-I

Photochemistry

Photochemical reactions – Interaction of electromagnetic radiations with matter, types of excitations, fate of excited molecule, quantum yield, transfer of excitation energy, actinometry.

Determination of reaction mechanism – Classification, rate constants and life times of reactive energy

states - determination of rate constants of reactions, effect of light intensity on the rate of photochemical reactions, types of photochemical reactions, photodissociation, gas-phase photolysis.

Photochemistry of alkenes – Intramolecular reactions of the olefinic bond-geometrical isomerism, cyclisation reactions, rearrangement of 1,4 – and 1,5-dienes.

UNIT-II

Photochemistry of carbonyl compounds – Intramolecular reactions of carbonyl compounds-saturated, cyclic and acyclic, β, γ-unsaturated and α, β-unsaturated compounds, cyclohexadienones, inter-molecular cycloaddition reactions-dimerisations and oxetane formation.

Photochemistry of aromatic compounds - Isomerisations, additions and substitutions

Miscellaneous photochemical reactions - Photo-Fries reactions of anilides, Photo-Fries rearrangement, Barton reaction, singlet molecular oxygen reactions, photochemical formation of smog, photodegradation of polymers, photochemistry of vision.

UNIT-III

Pericyclic reactions – Electrocyclic reactions, cycloaddition reactions and sigmatropic reactions, frontier molecular orbital and perturbation molecular orbital methods, correlation diagram and selection rules.