

SEMESTER-III
Paper S-3051

Polymer chemistry

Time: 3 Hrs.

M.M. 75 marks

Note: The paper will be divided into two sections.

Section-A One question with 10 parts (short answer word limit 20) spread over whole syllabus. Each part will be of 1 mark and candidate is required to attempt all the ten parts

Total 10 marks

Section-B Five questions (answer not exceeding 500 words) are from each Unit with internal choice will be asked and the candidate is required to attempt all five questions. Each question will be of 13 marks

Total 65 marks

Unit-I

General Introduction: Introduction, classification and Nomenclature of Polymers, Industrial scenario, Conformations in polymer chains, polymer waste disposal and remedies.

Unit-II

Synthesis of polymers: Chain growth polymerization (addition polymerization), Mechanism of polymerization (Free radical, Cationic, Anionic), Coordination polymerization, phase system in polymerization, Industrial polymerization, thermodynamic aspects of polymerization, copolymerization, Mechanism of polycondensation, phase technique in polycondensation, synthesis and application of some common industrial polymers.

Unit-III

Polymer Analysis and Characterization: Identification, (Physical testing, spectral method, chromatographic methods), Testing methods (thermal, electrical, chemical), Characterization (molecular weight distribution, fractionation), Determination of molecular weight of polymers, molecular weight distribution (MWD) curves.

Unit-IV

Polymer technology: physical properties versus Applications of Plastics, fibers, Elastomers, adhesives and polymer additives, polymer processing such as Casting, Thermoforming, Foaming, Lamination, Reinforcing, processing of fibers and Moulding processes.

Unit-V

Specialty polymers: Polyelectrolytes, Ionomers, conducting polymers, solid polymers, Electroluminescent polymers, Block copolymers, polymer colloids, thermoplastic elastomers(TPE), polyblends, polymer composites, thermally stable, liquid crystalline, telechelic and biomedical polymers, polysilicones and polyphosphazenes