SEMESTER-I

4. Polymer Science – I

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) **Total-50 marks**

Section-B: Two questions are from each unit will be asked with internal choice and the candidate is required to attempt five questions. **Total-50 marks**

Unit – I

Introduction of Polymer: Definition of Polymer, Classification of Polymer, Bonding in Polymer, History of Polymer.

Raw Materials: Oil, Natural gas, Coal, Types, Grades and indication of manufacturing, Source of natural Polymers and derivatives

Unit – II

Addition Polymerization: Cationic, Anionic, and Free-radical.

Kinetics of Polymerization – Free radical, cationic, anionic.

Unit – III

Coordination Polymerization: Ziegler Natta Catalysts and Stereo regular polymers **Condensation Polymerization**: Types, extent and degree of Polymerization and kinetics. Carother's equation, ring opening Polymerization.

Unit – IV

Copolymerization: Mechanism, reactivity ratio and composition – Block and graft copolymers. Kinetics of copolymerization.

Unit – V

Polymerization techniques: Bulk, Solution, Suspension, Emulsion, Melt Polycondensation

Recommended Books:

1. Polymer science: V.R. Goowarikar,N.V. Viswanathan,Jayadev Sridhar 2. Text book of polymer science: Fred W. Billmeyer
3. Polymer science & Technology: Joel R. Fried
4. Polymer Science and Technology: Premamoy Ghosh