VEER NARMADA SOUTH GUJARAT UNIVERSITY

Third Year B. Sc.
Chemistry
Polymers
(Effective from July 2002 – Revised in B O S dated 23/10/2002)

70 Marks (External)       Total 60 Hrs
30 Marks(Internal)       Time 3 Hrs.
(Uni. Exam)

UNIT – I

Basic:                        10 Hrs
Importance of polymers, Basic concepts : Monomers, repeat units of polymerization,
Nomenclature and classification of polymers, Isomerism in polymer chain, history of
polymers, intermolecular forces in polymers.

UNIT – II

Polymerisation:                10 Hrs
Chain and step polymerization, free radical, anionic, cationic and coordination
polymerization and their mechanism, polymerization in homogeneous and heterogeneous
system, Thermodynamic aspects of polymerization, Copolymerisation.

UNIT – III

Industrially Polymers:         10 Hrs
Synthesis of polymers (and their monomers), polyolefins, polydienes, Vinyl
polymers, Acrylic polymers, Fluoro polymers, Nylon, Polyesters, Polyurethane,
Polycarbonate, Phenolic resins Silicones.

UNIT – IV

Polymer analysis and characterisation:     10 Hrs
Identification : physical testing, introduction to application of spectral and
chromatographic methods molecular weight: polydispersity, number and weight average
molecular weight, Significance of mol. Wt., Mo. wt. determination by end group analysis,
viscometry, osmotic pressure methods.

UNIT – V

Crystalline and amorphous Polymers:       10 Hrs
Crystalline polymers, determination of degree of crystallinity, super molecular structure
of polymers.
Thermal instructions in polymers, glass transition temperature and its importance.
Dilatometric method for its determination.

UNIT – VI

Polymers reactions and processing : 10 Hrs
Dissolution of polymers chemical reactions of polymer, curing and cross linking reactions, polymer degradation, characteristic features of plastics elastomers and fibers, polymer additives, plasticizers and antioxidants. Moulding of plastic, spinning of fibers.

Reference Books: