

SEMESTER-IV
2. Polymer Product Technology

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

Pneumatic Tyre: Functions of tyre, tube and rim assembly. Components of a tyre and their function. Tyre Construction (Bias, Radial, Bias-belted). Tyre Types. Tread design (Lug, Rib and Semi Lug). Compounding for casing, tread and bead. Tyre reinforcing materials (Rayon, Nylon, Polyester, Aramid, Glass Fiber and Steel Wire). Organic cord treatment (Dipping), Metal to rubber bonding.

Tyre Design and performance: Criteria for cycle, motorcycle, truck, aircraft and tube-less tyres. Tyre Manufacturing process, Defects observed and remedial action.

Lateral Stiffness, Torsional Stiffness, Cornering power, Rolling Resistance, Friction and Wet Grip. Destructive and Non-destructive tests of tyre.

Unit– II

Tube and Valves: Principles of Tube Design, Manufacturing of Tubes: Tube extrusion, valving, splicing, inflation, curing. Compounding of tube and tube valve. Tube Defects and Tube Testing.

Conveyor Belting: Functions, Components, component requirement, compounding and Belt design. Defects and testing of belt.

Flat Belt and V-Belt: Functions, Components, component requirement, compounding and Belt design. Defects and testing of belt.

Unit – III

Hoses: Hose Design and Construction, Reinforcing Materials, Moulded, Machine made, hand made and circular woven hoses.

Rubber Footwear: Hot air vulcanized, compression molded, direct molded. Process for shoe bottoming, injection molded sole and heel units. Safety, conductive and anti static footwear. Footwear compounding.

Unit – IV

Rubber to metal bonded components: Metal cleaning, application of bonding medium, equipment lining and moulding.

Cellular Rubber: Expansion technology, sponge rubber, expanded rubber by nitrogen gas and chemical blowing agents.

Sports Goods: Tennis Ball, Football, Basketball, Volleyball and Golf Ball.

Unit – V

Cables: Compound formulations and evaluations, application of insulator and sheath, curing techniques and specialized cable components.

Latex Products: Dipped Goods, Threads and Foams. Mix design and plant design.
Rubber Rollers.

Recommended Books:

- 1 .Rubber Technology and Manufacturing: C. M. Blow.
2. Introduction of Polymer Sc. & Rubber Technology, Vol. I, Ed. By Dr. R. Mukhopadhyay.
- 3 .Rubber Engineering, Ed. By K. S. Logonathan.

