

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Regular Examination January / February 2011

Subject code: 711607N**Subject Name: Polymer Science & Synthesis of Polymers (Polymer Group)****Date: 03 /02 /2011****Time: 02.30 pm – 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
- 4.

- Q.1** (a) Discuss in detail about the Proteins & Lignin as a source of Natural Polymers. **07**
(b) How can you differentiate the Low molecular weight compound & High molecular weight compound? Explain in detail with examples. **07**

- Q.2** (a) Write a note on Ziegler-Natta Catalysts. **07**
(b) Write the Salient features of Bulk Polymerization & Solution Polymerization Techniques. **07**

OR

- (b) Explain in detail about Ring Opening Polymerization. **07**

- Q.3** (a) Explain the Number-Average & Weight Average Molecular Weight Concept. **07**
(b) A Sample of high polymer contains 20 percent by weight of macromolecules of molecular weight 10,000 and 80 percent by weight of macromolecules with molecular weight 100,000. Calculate the value of $\overline{M}_n$ and $\overline{M}_w$ **04**
(c) 28 gram of ethene was polymerized by Radical Polymerization process and the average degree of polymerization of Polythene was found to be 1000. Calculate (i) The number of molecules of ethene in original sample.(ii) Number of molecules of Polythene formed. **03**

OR

- Q.3** (a) Explain in detail about Polydispersity and Molecular weight distribution in Polymers & Discuss the Practical Significance of Polymer Molecular Weight. **07**
(b) Write the Salient features of Cationic Polymerization & Anionic Polymerization. **07**

- Q.4** (a) Explain in detail about Structural Regularity in Polymers based on Optical Isomerism. **07**
(b) Discuss the process of Polymer Dissolution. **07**

OR

- Q.4** (a) Describe about Microstructures based on Geometrical Structure. **07**
(b) Explain the nature of Polymer molecules in solution. **07**

- Q.5** (a) Define the term Polymer degradation. Explain Thermal degradation of Polymer. **07**
(b) Describe the reactions of polymer molecules with Hydroxyl groups. **07**

OR

- Q.5** (a) Explain the Mechanical Degradation of Polymer with examples. **07**
(b) Explain the Addition & Substitution reaction of Polymer Molecules. **07**
