

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024****Subject Code:3174403****Date:04-12-2024****Subject Name: Sustainable Polymer Engineering****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define: Monomer, Polymer and Oligomer. **03**  
 (b) What is repeating units, structural units, degree of polymerization and molecular weight? **04**  
 (c) Write a note on classification of polymer. **07**
- Q.2** (a) Define: homopolymer, co-polymer and elastomer **03**  
 (b) What is fibre, plastics and its application? **04**  
 (c) Discuss poly dispersity and molecular weight distribution. **07**
- OR**
- (c) Write a note on Mark-Houwink Sakurada equation. **07**
- Q.3** (a) Define: structures, configuration and polymerization. **03**  
 (b) Write about mechanism and kinetics of polymerization. **04**  
 (c) Explain effect of molecular weight on polymer end properties functionality principle. **07**
- OR**
- Q.3** (a) What is addition, condensation and co-polymerization? **03**  
 (b) Difference between thermoset and thermoplastic. **04**  
 (c) Write a note on various types of polymerization reactions in detail. **07**
- Q.4** (a) Define: Bulk solution and Emulsion polymerization **03**  
 (b) Write a short note on suspension polymerization. **04**  
 (c) Discuss techniques of polymerization. **07**
- OR**
- Q.4** (a) What is mechanical, thermal and photo degradation? **03**  
 (b) Write advantages and disadvantages of polymer degradation. **04**  
 (c) Discuss methods of degradation of polymers in detail. **07**
- Q.5** (a) Define: compression molding, transfer molding and injection molding **03**  
 (b) Comparison of bulk solution, emulsion and suspension polymerization techniques. **04**  
 (c) Write a short note on rubber processing in two roll mill. **07**
- OR**
- Q.5** (a) What is calendaring molding, thermoforming and internal mixer? **03**  
 (b) Write a note on unit operations in polymer industries. **04**  
 (c) Write various types of molding in polymer processing. **07**

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