

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III(OLD) • EXAMINATION – WINTER 2016

Subject Code:132301

Date:04/01/2017

Subject Name:Introduction to Plastic Material Science

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.

- Q.1** (a) What is Glass transition temperature? Explain factors influencing the Glass transition temperature. **07**
- (b) Differentiate between polymers and low molecular weight compounds. **07**
- Q.2** (a) Explain classification of Polymer in detail. **07**
- (b) Write down the effect of crystallinity on the mechanical, chemical and thermal properties of polymer. **07**
- OR**
- (b) What is copolymer? Write down different types of copolymer. What do you mean by terpolymer? Give examples. **07**
- Q.3** (a) Explain Free radical polymerization in detail. **07**
- (b) Give difference between amorphous & crystalline polymers. **07**
- OR**
- Q.3** (a) Explain Polydispersity & Molecular weight distribution in polymers. **07**
- (b) Give difference between Step polymerization & Chain polymerization. **07**
- Q.4** (a) What do you mean by isomerism in polymers? Write down with examples about the stereoisomerism and geometrical isomerism of polymers. **07**
- (b) Explain Ziegler- Natta Polymerization in detail. **07**
- OR**
- Q.4** (a) Explain about Number Average and weight Average concept of Polymer in detail. **07**
- (b) Define: Thermoset, Thermoplastic, inhibitor, chain transfer agent, contour length, Ionic Polymerization, Monomer. **07**
- Q.5** (a) Write functionality of the following compounds. **07**
- (i) $\text{HOCH}_2\text{CH}_2\text{OH}$ (ii) $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$ (iii) $\text{H}_2\text{NCH}_2(\text{CH}_2)_4\text{CH}_2\text{NH}_2$ (iv) $\text{HOOCCH}_3\text{CH}(\text{OH})\text{COOH}$ (v) $\text{CH}\equiv\text{CH}$ (vi) CH_3NCO (vii) $\text{CH}_2=\text{CH}_2$
- (b) Explain about Initiator with suitable examples. **07**
- OR**
- Q.5** (a) Explain Bulk Polymerization with advantages of it over solution polymerization. **07**
- (b) Explain Emulsion Polymerization in detail. **07**
