Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – SUMMER 2013

Subject Code: 132301 Date: 04-06-2013

Subject Name: Introduction to Plastic Material Science

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.**

Q.1	**(a)**	How do you classify the polymers based on their chemistry of formation? State with examples.	**07**
	(b)	Differentiate between polymers and low molecular weight compounds.	**07**
Q.2	**(a)**	Write down the types of transition in polymers. Explain glass transition temperature for both amorphous and crystalline polymer with the help of specific volume vs. temperature curve.	**07**
	(b)	Which are the types of Addition Polymerization? Explain Free radical Polymerization in detail.	**07**
		OR	
	(b)	Define: Resin, plastic, inhibitor, chain transfer agent, contour length, Ionic polymerization.	**07**
Q.3	**(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.3	**(a)**	What is copolymer? Write down different types of copolymer. What do you mean by terpolymer? Give examples.	**07**
	(b)	Explain about effect of Molecular Weight on solubility of Polymer.	**07**
Q.4	**(a)**	What is glass transition temperature? How is the glass transition temperature of a polymer affected by hydrogen bonding in the polymers?	**07**
	(b)	Write down the differences between graft and block copolymer. Give examples.	**07**
		OR	
Q.4	**(a)**	Write down the difference between suspension and emulsion polymerization.	**07**
	(b)	Calculate Mn & Mw for a polymer consisting of three fractions with molecular weights, 100000,200000 and 300000. The mole fractions of each of these fractions are found to be 0.1, 0.5 and 0.4 respectively.	**07**
Q.5	**(a)**	Write down the effect of crystallinity on the mechanical, chemical and thermal properties of polymer.	**07**
	(b)	Write down the differences between the thermoplastics and thermoset polymers.	**07**
		OR	
Q.5	**(a)**	Define crystallinity. How is crystallinity of a polymer determined?	**07**
	(b)	Write down the characteristics of crystalline and amorphous polymers.	**07**

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