Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-III • EXAMINATION – WINTER 2013

Subject Code: 132301 Date: 07-12-20 Subject Name: Introduction to Plastic Material Science		13	
Time: 02.30 pm - 05.00 pm Total Marks: 70			
	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a)	What are polymers? Give detail classification of polymers with suitable examples.	07
	(b)	What are chain and step polymerization? Give difference between them.	07
Q.2	(a)	How polymers and low molecular weight compounds are differing from each other?	07
	(b)	List various steps of free radical polymerisation and explain each with suitable example.	07
		OR	
	(b)	Explain various transitions of states associated with low molecular weight compounds and polymeric material.	07
Q.3	(a) (b)	 Define Glass transition temperature. Which factors affects the Tg? Explain. Answer the following: i) Tg and molecular Weight ii) Tg and Plasticizers 	07 07
		OR	
Q.3	(a)	What do you mean by Polydispersity? Explain Polydispersity and Molecular weight distribution in polymers.	07
	(b)	 Answer the following: i) Write a note on : Tacticity ii) Calculate the contour length and the extended chain length of PE Mol. Given: - n =4000 , Bond angle-109°28' ,Segment length -1.54 Å. 	07
Q.4	(a) (b)	Which polymerization technique forms CMC? Explain in detail with diagram. Discuss: Microstructure of polymer chain based on the chemical structure. OR	07 07
Q.4	(a)	Explain bulk polymerization technique along with advantages, disadvantages and applications.	07
	(b)	Explain cationic polymerization with suitable example.	07
Q.5	(a) (b)	Explain with suitable examples Hydrolysis and Acidolysis of polymers A polymer sample consists of a mixture of three monodispersed polymer with molar masses 200000, 250000 and 300000 g/mol in the ratio 1:2:1 by number of chains. Calculate Mn, Mw and Mw/Mn.	07 07
05	(a)	UK What are Speculities? Give folding of chains during crystal formation	07
V .2	(a) (b)	Explain glass transition temperature for amorphous, semi crystalline and crystalline polymers with the help of specific volume vs. temperature curve.	07
