Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 132301 **Date: 02/06/2017**

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)**	Give difference between thermoplastic and thermosetting plastics. Differentiate between step-growth and chain-growth polymerization.	**07**
	(b)	Define polymers. Classify various types of polymers with suitable examples.	**07**
Q.2	**(a)**	Explain Free radical polymerization.	**07**
	(b)	Explain with suitable examples Hydrolysis and Acidolysis of polymers.	**07**
		OR	
	(b)	Differentiate between low molecular weight compound and polymers.	**07**
Q.3	**(a)**	Explain Polydispersity & Molecular weight distribution in polymers.	**07**
	(b)	What is Glass transition temperature? Discuss various factors affecting Tg.	**07**
		OR	
Q.3	**(a)**	Write functionality of the following compounds. i) NH_2CH_2COOH v) CH_3NCO ii) $CH_2=CH_2$ vi) C_6H_5COOH iii) $CH_3CH(OH)COOH$ vii) $HOC_6H_4CH_2OH$ iv) $CH_3(CH_2)_4CH_2NH_2$	**07**
	(b)	Explain bulk polymerization technique along with advantages, disadvantages and applications.	**07**
Q.4	**(a)**	Explain Emulsion polymerization in detail.	**07**
	(b)	Define: Co-polymer, Initiator, Cross-linked polymer, Graft copolymer, Degree of polymerisation, Inhibitor, Block copolymer	**07**
		OR	
Q.4	**(a)**	Explain anionic polymerization with suitable example.	**07**
	(b)	Explain Poly condensation reaction with suitable example.	**07**
Q.5	**(a)**	Explain optical isomerism by suitable examples.	**07**
	(b)	Discuss various factors affecting crystallisability.	**07**
		OR	
Q.5	**(a)**	Discuss Ziegler Natta polymerization.	**07**
	(b)	A polymer sample consists of a mixture of three monodispersed polymer with molar masses 100000, 150000 and 200000 g/mol in the ratio 2:1:1 by number of chains. Calculate Mn, Mw and PDI.	**07**

****