Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. SEMESTER III–EXAMINATION – WINTER 2015

Subject code: 2731603 **Date: 04/12/2015**

Subject Name: Polymer Structure & Property Prediction

Time: 2:30 PM to 5:00 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)**	**Explain the effect of Structure regularity, molecular stiffness & intermolecular attraction on Polymer properties with diagram.**	**(07)**
	(b)	**Discuss in detail about General features of Chemical Composition & its effects on Polymer Properties.**	**(07)**
Q.2	**(a)**	**"Carbon is an important element in organic chemistry." Justify the statement.**	**(07)**
	(b)	**How the monomeric ingredients impurities have a variety of effects upon the properties & uses? Explain in detail.**	**(07)**
		OR	
	(b)	**Discuss the different additives in compounding to produce the final commercial composition and properties.**	**(07)**
Q.3	**(a)**	**Explain the conversion of 100% Total Solids from Low to High Molecular Weight by giving examples of Thermosetting Resins & Monomer Casting.**	**(07)**
	(b)	**What do you mean by Mechanical Failure? How it may be observed in Polymeric materials? Describe in detail.**	**(07)**
		OR	
Q.3	**(a)**	**"The molecular weight of the polymer molecule has a number of significant effects upon its chemical properties." Explain the statement in detail.**	**(07)**
	(b)	**Discuss the effects of molecular weight on Thermodynamic Properties.**	**(07)**
Q.4	**(a)**	**List the different structural factors which restrict the rotation of polymer molecule. Explain these factors in detail.**	**(07)**
	(b)	**Write in detail about effect of Polymer molecular flexibility on Thermal Properties.**	**(07)**
		OR	
Q.4	**(a)**	**Discuss about effect of Polymer molecular flexibility on Mechanical Properties.**	**(07)**
	(b)	**Discuss the important effect of Copolymerization & Plasticizer Structure on molecular flexibility.**	**(07)**
Q.5	**(a)**	**Discuss the different Stretching process for Polymer Orientation.**	**(07)**
	(b)	**Discuss the Relations between Orientation and Crystallization.**	**(07)**
		OR	
Q.5	**(a)**	**Write about Mono & Biaxial Orientation.**	**(07)**
	(b)	**How Orientation of Polymer molecules affect the Thermal & Electrical properties of Polymer? Describe in detail.**	**(07)**