Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (New) EXAMINATION – WINTER 2018

Subject Code: 2133602 Date: 28/11/2018

Subject Name: Polymer Chemistry (Elective-I)

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.**

			MARKS
Q.1	**(a)**	What make polymer different from other material?	**03**
	(b)	Elaborate the applications of polymers.	**04**
	(c)	Draw the chemical structure of following: i. Styrene ii. Vinyl Chloride iii. Bakelite iv. Ethylene v. Butadiene vi. Urea vii. lactic acid.	**07**
Q.2	**(a)**	What is glass transition temperature?	**03**
	(b)	Write a short not on molecular weight distribution.	**04**
	(c)	Explain solution and bulk polymerization in detail.	**07**
		OR	
	(c)	Explain emulsion and suspension polymerization in detail.	**07**
Q.3	**(a)**	Explain in detail degree of polymerization.	**03**
	(b)	Explain with example ionic and copolymerization.	**04**
	(c)	Elaborate LCST & UCST.	**07**
		OR	
Q.3	**(a)**	Draw the structure of polycaprolactum, terephthalic acid, phenol formaldehyde resin	**03**
	(b)	Differentiate between thermoplastics and thermoset polymer	**04**
	(c)	Explain crude oil distillation in detail.	**07**
Q.4	**(a)**	Explain free radical kinetics.	**03**
	(b)	Explain how Mn and Mw are determined.	**04**
	(c)	Explain synthesis of caprolatum and butadiene	**07**
		OR	
Q.4	**(a)**	What are the different engineering problems associated with bulk and solution polymerization?	**03**
	(b)	Write a note on Gel Permeation Chromatography.	**04**
	(c)	Explain the synthesis of urea and melamine.	**07**
Q.5	**(a)**	What are the different ways of expressing molecular weight of a polymer? Give the formulas for expressing them.	**03**
	(b)	What are the different methods to determine the crystallinity in polymers?	**04**
	(c)	Derive an expression for the rates of all the reactions involved in anionic polymerization. Also derive expressions for degree of polymerization in anionic polymerization	**07**
		OR	
Q.5	**(a)**	Elaborate the end uses of polymers.	**03**
	(b)	Explain addition and condensation polymerization.	**04**
	(c)	Derive an expression for the rates of all the reactions involved in cationic polymerization. Also derive expressions for degree of polymerization in cationic polymerization	**07**

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