Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III(Textile Production)Examination December 2009

Subject code: 132804 **Subject Name: Polymer Chemistry**

Date: 29 /12 /2009 **Time: 11.00 am – 1.30 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)**	What is polymerization ? Explain emulsion polymerization in detail.	**07**
	(b)	Discuss Acrylic polymers in detail.	**07**
Q.2	**(a)**	What is thermo setting polymer? Discuss any two thermo setting polymer details	**07**
	(b)	What is natural rubber? Explain vulcanization reaction in detail.	**07**
		OR	
	(b)	Explain classification of polymers.	**07**
Q.3	**(a)**	What is weight average molecular weight and number average molecular weight? Determine $Mn = \frac{\sum niMi}{\sum ni}$, $M_w = \frac{\sum niMi^2}{\sum niMi}$	**07**
	(b)	Explain end group analysis in detail.	**07**
		OR	
Q.3	**(a)**	Explain geometry of polymers in detail.	**07**
	(b)	Determine the equation $\frac{1}{M_w} = \left(\frac{KC}{R_\theta}\right)_{c,\theta\to 0}$	**07**

Where C = concentration of solution

R_θ = Rayleigh ratio at any angle

K = light scattering calibration constant

Q.4	**(a)**	Explain IR spectroscopy method in detail.	**07**
	(b)	Explain X ray diffraction ?Explain X ray diffraction pattern of highly crystalline and amorphous polymer.	**07**
		OR	
Q.4	**(a)**	Explain thermal analysis of polymers technique.	**07**
	(b)	Discuss microscopy method to determine polymers	**07**
Q.5	**(a)**	What is addition and substitution reaction ? explain with suitable examples.	**07**
	(b)	Discuss extrusion and blow molding in detail.	**07**
		OR	
Q.5	**(a)**	Give your inputs to minimize pollution by polymers.	**07**
	(b)	Explain hydrolysis and hydrogenation reaction with detail.	**07**

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