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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V- EXAMINATION – SUMMER 2016

Subject Code: 152302 **Date: 21/05/2016**

Subject Name: Physics Of Plastics

Time: 02:30 PM to 05:00 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)**	Discuss factors affecting crystallinity in detail	**07**
	(b)	Discuss Process of polymer dissolution in detail	**07**
Q.2	**(a)**	What is intrinsic viscosity? Discuss Gaussian Duistribution.	**07**
	(b)	Discuss Boltzmann's superposition Principle	**07**
		OR	
	(b)	Discuss Flory Huggins Theory in detail.	**07**
Q.3	**(a)**	Discuss Structural and Stereo Isomerism in detail	**07**
	(b)	Discuss Amorphous v/s. Crystalline polymers	**07**
		OR	
Q.3	**(a)**	Define : Spherulites , Crystallisability; theta temperature; Rayleigh ratio; Mesogens; Polymer Configuration ; contour length.	**07**
	(b)	Discuss Size Exclusion Chromatography	**07**
Q.4	**(a)**	Discuss Mark Houwink equation and its significance	**07**
	(b)	What is Avogadro's number? If a PE molecule has 3000 nos.of monomers , each with a molar mass of 28 g/mol, calculate the weight of each molecule?	**07**
		OR	
Q.4	**(a)**	Explain the effects of chemical structure on Tg	**07**
	(b)	Gradient elution technique, explain.	**07**
Q.5	**(a)**	How do we Measure Mn by osmotic pressure	**07**
	(b)	What is Chain length and contour length? Calculate the chain length and contour length of a PE molecule whose –C-C- chain is 1.54A˚ and bond angle is 109˚ 28'. Assume n=1000.	**07**
		OR	
Q.5	**(a)**	What is mean end to end distance? Consider an ideal polyethylene chain with molar mass $M=10^a$ g/mol; where a=6 . Its mean end to end distance is given by $\langle R^2 \rangle = Cb^2N$, where the monomer length is b=2.5A˚ and the coefficient C=5.5, Estimate its root end square end to end distance $\sqrt{\langle R^2 \rangle}$ if the molar mass M_{mon} = 28 g/mol.	**07**
	(b)	1. Discuss RANDOM WALK Probability 2. radius of gyration	**07**

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