Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II EXAMINATION – SUMMER 2017

Subject Code: 2712407 **Date: 11/05/2017**

Subject Name: Polymer Alloys and Blends

Time: 02:30 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)**	What are the different thermal analysis methods used to characterize polymer blends? Explain in detail about Differential thermal analysis.	**07**
	(b)	Explain the following terms (i) Compatibilizer (ii) Interpenetrating polymer network (iii) Immiscible polymer blend (iv) Homologous polymer blend (v) Pseudo IPN (vi) Graft copolymer (vii) Miscible polymer blend	**07**
Q.2	**(a)**	Which techniques are used to study the phase morphology of the blend component? Explain any one of them.	**07**
	(b)	Explain the two roll mill with suitable figure.	**07**
		OR	
	(b)	Define the term LCST and UCST, why most of the polymer blends demonstrate LCST rather than UCST ?	**07**
Q.3	**(a)**	What is degree of compatibility? List various compatibilization methods and explain addition block and graft copolymerization method.	**07**
	(b)	Discuss the Banburry mixer in detail with appropriate figure.	**07**
		OR	
Q.3	**(a)**	Discuss the differential scanning calorimetry with a suitable graph. What are the factors the affecting the T_g ?	**07**
	(b)	Differentiate between single screw and twin screw extruder with suitable sketches.	**07**
Q.4	**(a)**	Mention various techniques for preparation of polymer blends. Explain melt blending process in detail.	**07**
	(b)	Explain in detail the compatibilization mechanism of blend components by reactive compatibilization.	**07**
		OR	
Q.4	**(a)**	How will determine the molecular weight by light scattering method ?	**07**
	(b)	Describe the selection criteria for preparation of polymer blends and alloys. Explain any blend with a suitable example.	**07**
Q.5	**(a)**	Describe the working principle and applications of Transmission Electron Microcopy (TEM) with respect to polymer blends.	**07**
	(b)	Discuss the advantages and application of styrene based blends.	**07**
		OR	
Q.5	**(a)**	Write a short note on X-ray scattering technique.	**07**
	(b)	Discuss any two polymer blends along with it properties and applications.	**07**

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