

# **GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VIII (NEW) EXAMINATION – WINTER 2017**
**Subject Code: 2182302**
**Date: 02/11/2017**
**Subject Name: Polymer Alloys and Blends**
**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.

		MARKS
Q.1	(a) What are Blends and Alloys? Discuss.	03
	(b) Which are the reasons to make Polymer alloy/blends?	04
	(c) How scanning electron microscope (SEM) is working? Discuss with neat diagram along with sample preparation and advantages.	07
Q.2	(a) Define the followings: 1) Homologous Polymer blend 2) Compatible polymers blend 3) Immiscible polymer blends	03
	(b) Which are the techniques used for the preparation of polymer blends? Discuss.	04
	(c) Discuss techniques for determination of polymer-polymer miscibility.	07
<b>OR</b>		
Q.3	(c) Explain the Huggins-Flory theory for polymer blends.	07
	(a) Two miscible polymers A and B are blended in weight ratio of 40:60. If the glass transition Temperature, $T_g$ of polymer A is $-10^\circ\text{C}$ and that of polymer B is $70^\circ\text{C}$ , calculate the $T_g$ of the blend.	03
	(b) How to select the blend components? Explain.	04
	(c) Explain thermodynamics of polymer blends. Give Phase diagram with LCST and UCST.	07
<b>OR</b>		
Q.3	(a) Define: Block copolymer, graft copolymer and Interpenetrating Polymer Networks.	03
	(b) Explain the significance of Gas lattice model in blends.	04
	(c) Discuss properties and applications of PVC/NBR & PC/PBT.	07
Q.4	(a) Describe the properties and application of PPO/HIPS blends.	03
	(b) Describe the working of Two roll mills in polymer mixing with neat diagram.	04
	(c) What is compatibilizer? List various compatibilization methods and explain addition block and graft copolymerization method.	07
<b>OR</b>		
Q.4	(a) Write about PVC/ABS Blend.	03
	(b) Discuss various blends used to improve barrier properties for packaging applications.	04
	(c) Describe Differential scanning Calorimeter (DSC) with neat diagram.	07
Q.5	(a) What are composites? Give difference between alloys/blends and composites.	03
	(b) Discuss Interfacial Adhesion and Degree of compatibility.	04



OR

- Q.5**
- (a) Which are the properties and applications of PC/ABS Blends? Discuss. **03**
  - (b) Explain Melt Blending in detail. **04**
  - (c) Describe the working of Banbury mixture with neat diagram. **07**

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