Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VIII(NEW) EXAMINATION – SUMMER 2019**

**Subject Code:2182302 Date:15/05/2019**

**Subject Name:Polymer Alloys and Blends**

**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 are Blends and Alloys? Differentiate between polymer alloy and blend. | **03** |
| | **(b)** | List various steps to select the blend components. | **04** |
| | **(c)** | Define following<br>1. Interfacial adhesion 2. Immiscible polymer blend<br>3. Homologous Polymer blend 4. Compatible polymer blend<br>5. Compatibilizer 6. Metastable miscibility<br>7. IPN | **07** |
| **Q.2** | **(a)** | Explain Compatibilization method using block and graft copolymers. | **03** |
| | **(b)** | What are the reasons for making polymer blend? Discuss. | **04** |
| | **(c)** | Discuss various techniques for determination of polymer-polymer miscibility. | **07** |
| | | **OR** | |
| | **(c)** | Discuss with neat diagram working principal of SEM along with sample preparation and advantages. | **07** |
| **Q.3** | **(a)** | Which are the properties and applications of PC/ABS Blends? Discuss. | **03** |
| | **(b)** | Explain working of Two roll mills in polymer mixing with neat diagram. | **04** |
| | **(c)** | Discuss thermodynamics of polymer blends. Give Phase diagram with LCST and UCST. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | What are composites? Give difference between alloys/blends and composites. | **03** |
| | **(b)** | Explain the significance of Gas lattice model in blends. | **04** |
| | **(c)** | Writa a note on: Flory-Huggins theory | **07** |
| **Q.4** | **(a)** | Describe the properties and application of PPO/HIPS blends. | **03** |
| | **(b)** | Which are the techniques used for the preparation of polymer blends? Discuss. | **04** |
| | **(c)** | Describe Differential scanning Calorimeter (DSC) with neat diagram. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Write about PVC/ABS Blend. | **03** |
| | **(b)** | List various compatibilization methods for Polymer blends. Discuss degree of compatibility. | **04** |
| | **(c)** | Explain Twin screw extruder and its importance in preparation of polymer blends. | **07** |

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|---|---|---|---|
| **Q.5** | **(a)** | Two miscible polymers A and B are blended in weight ratio of 30:70. If the glass transition Temperature, Tg of polymer A is -10ºC and that of polymer B is 80ºC, calculate the Tg of the blend. | **03** |
| | **(b)** | Discuss various blends used to improve barrier properties for packaging applications. | **04** |
| | **(c)** | Describe the working of Banbury mixture with neat diagram. | **07** |

**OR**

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|---|---|---|---|
| **Q.5** | **(a)** | Write about Reactive Blending. | **03** |
| | **(b)** | Discuss fundamental principles for development of polymer alloys and blends. | **04** |
| | **(c)** | What is FTIR? Discuss working of FTIR and its applications. | **07** |

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