

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024****Subject Code:3172316****Date:01-06-2024****Subject Name:Plastic Additives, Compounding 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.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1**
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|---|-----------|
| (a) List the reasons for making polymer blend. | 03 |
| (b) Discuss various steps to select the blend components. | 04 |
| (c) Define additives. Classify types of additives used in plastic industry. | 07 |

- Q.2**
- | | |
|---|-----------|
| (a) Give advantages of compounding. Give types of Batch mixers and continuous mixers. | 03 |
| (b) Write about: Plasticizers. | 04 |
| (c) Discuss UV stabilizer mechanism along with examples and applications. | 07 |

OR

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| (c) Explain the construction and working of a high speed mixture with a neat diagram. | 07 |
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- Q.3**
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|---|-----------|
| (a) Describe the properties and application of PPO/HIPS blends. | 03 |
| (b) Differentiate between co-rotating and counter rotating twin screw extruder. | 04 |
| (c) What is the role of Flame retardants? Explain the mechanism of functioning of flame retardants. | 07 |

OR

- Q.3**
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|--|-----------|
| (a) How antistatic agent works? Explain. | 03 |
| (b) Give function and applications of (1) Nucleating agent (2) Mould releasing agents. | 04 |
| (c) Discuss role of Antioxidants. Explain the mechanism of antioxidant in polymers with example. | 07 |

- Q.4**
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|---|-----------|
| (a) Explain function of anti-blocking agent with suitable examples | 03 |
| (b) Describe construction and working of Two roll mill with neat diagram. | 04 |
| (c) List various impact modifiers used in plastic industry and explain its mechanism of action. | 07 |

OR

- Q.4**
- | | |
|---|-----------|
| (a) Two miscible polymers A and B are blended in weight ratio of 20:80. If the glass transition Temperature, T _g of polymer A is -10 °C and that of polymer B is 80 °C, calculate the T _g of the blend. | 03 |
| (b) Give properties and applications of (i) PC/ABS (ii) PVC/ABS Blends. | 04 |

- (c) With neat diagram discuss principles of operation and design of Banbury mixer. **07**
- Q.5** (a) Define: Immiscible polymer blend, miscible polymer blends and Polymer alloy. **03**
- (b) Define: Compatibilization. Discuss any one method of Compatibilization. **04**
- (c) Discuss with neat diagram working principal of SEM along with sample preparation and advantages. **07**
- OR**
- Q.5** (a) What are Blowing agents? Discuss. **03**
- (b) Describe construction and working of Ribbon blenders. **04**
- (c) What is the role of Lubricants? Explain the internal and external lubricants with suitable examples. **07**
