

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VII EXAMINATION – SUMMER 2026

Subject Code:3172316

Date:08-06-2026

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	(a) Define Additives and Compounding. Explain in brief about significance of Additives in Plastic Industries.	03
	(b) List the compounding methods used in Plastic Industries. List the advantages of Twin-Screw Extruder.	04
	(c) List and explain in brief about Technical requirements of Additives.	07
Q.2	(a) Define: (1) Anti-oxidants (2) Polymer Blends (3) Polymer Alloys	03
	(b) Explain Mechanism of Polymer Oxidation.	04
	(c) Give detail classification of Additives used in Plastic with suitable examples.	07
	or	
	(c) Explain Inhibition mechanism by Antioxidants for Plastic. Also draw Anti-oxidants cycle and give classification of Anti-oxidants with examples.	07
Q.3	(a) Define: (1) Miscible Polymer Blend (2) Engineering Polymer. List types of Dry Mixers used for Compounding of Plastics.	03
	(b) Draw line diagram of Ribbon Blender.	04
	(c) Draw and Explain construction and working of Banbury Mixer.	07
	or	
Q.3	(a) List the various techniques used for manufacturing Polymer blends and alloys.	03
	(b) List the reasons for making Polymer Blends.	04
	(c) Short Note: (1) Latex Blending (2) Solution Blending	07
Q.4	(a) Define Blowing Agents. List the types of Blowing Agent. Explain working of Physical Blowing agent in brief.	03
	(b) Compare: Dyes and Pigments	04
	(c) Give properties and applications of PC/ABS Blends	07
	or	
Q.4	(a) Define and Explain in brief basic mechanism of action of Antiblocking Agents.	03
	(b) Define Impact modifier. Explain working action of Impact modifier in PVC.	04
	(c) List the types of Antistatic Agents. Explain about basic principles and action of Antistatic Agents.	07

- Q.5** (a) Discuss effect of Plasticizer on plastic properties. **03**
(b) Short Note: Additives for recycling of Plastics. **04**
(c) Define Flame Retardant. Explain mode of action of Flame Retardant. Give example of Flame Retardant used in plastic material. **07**
- or**
- Q.5** (a) Discuss various steps to select the blend components. **03**
(b) 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 $-20\text{ }^{\circ}\text{C}$ and that of polymer B is $70\text{ }^{\circ}\text{C}$, calculate the T_g of the blend. **04**
(c) Describe Differential scanning Calorimeter (DSC) with neat diagram. **07**
