

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII EXAMINATION – SUMMER 2025****Subject Code:3172316****Date:27-05-2025****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) Compare: Plastic Additives with Polymer Blends	03
	(b) Define : (i) Homologous Polymer Blends (ii) Miscible Polymer Blend (iii) Polymer alloy (iv) Interpenetrating Polymer Network	04
	(c) List the various compounding equipments used for mixing additives with Plastics. Explain about Ribbon Blender with neat sketch.	07
Q.2	(a) Give classification of additives.	03
	(b) List technical requirements of additives.	04
	(c) Define Antioxidants. Explain mechanism of polymer oxidation and mechanism of Antioxidants with Auto-oxidation and Anti-oxidation cycle.	07
	OR	
	(c) Explain about Plasticizer used for Plastic Materials.	07
Q.3	(a) List various types of Antioxidants used for plastic with examples.	03
	(b) List reasons for making Polymer Blends.	04
	(c) Explain Twin screw extruder used for compounding of plastic material.	07
	OR	
Q.3	(a) List methods of Blending.	03
	(b) Explain about solution blending.	04
	(c) Explain Transesterification (Ester exchange reaction) with example.	07
Q.4	(a) List properties of PC/ABS blend.	03
	(b) List fundamental steps to developed & design ideal blend.	04
	(c) Explain Antistatic agents used for plastic material.	07
	OR	
Q.4	(a) Compare : Pigments and Dyes	03
	(b) Explain in brief about Blowing Agent.	04
	(c) Explain principle and working of Scanning Electron Microscope (SEM) with neat sketch.	07
Q.5	(a) Two miscible Polymers A and B are blended in weight ratio of 30:70. If glass transition temperature, T _g of Polymer A is -10 ⁰ C and that of Polymer B is 80 ⁰ C. Calculate the T _g of Polymer Blend.	03
	(b) Explain in brief about Nucleating Agent and Curing agent.	04
	(c) Explain about Anti-blocking Agent used for plastic in detail.	07
	OR	
Q.5	(a) Define Flame retardant. Give example of Flame of Flame retardant.	03
	(b) What is impact modifier? Explain in brief with example of PVC.	04
	(c) Explain about PPO/HIPS blend in detail.	07
