

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V EXAMINATION – SUMMER 2025

Subject Code:3152303

Date:17-05-2025

Subject Name:Plastic Recycling & Waste Management

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 Primary Recycling & list the technical problems associated with primary recycling of plastics.	03
	(b) Draw a neat labeled flow diagram showing flow of plastics products and plastic waste.	04
	(c) Define Incineration. Discuss about incineration of predominantly plastic waste & the problems associated with it.	07
Q.2	(a) Define i) Nuisance Plastics ii) Secondary Recycling iii) Quaternary Recycling	03
	(b) Define Pyrolysis and list the advantages of Pyrolysis.	04
	(c) Discuss about different Plastic Identification codes with applications of those plastics.	07
	OR	
	(c) Discuss about the Recycling of PET.	07
Q.3	(a) Describe various sources of plastic waste.	03
	(b) Explain the recycling of HDPE containers with a neat flow diagram.	04
	(c) List the properties which are used as a basis for separation processes. Explain about the Float/Sink separation technique to separate mixtures of plastic with a neat flow diagram.	07
	OR	
Q.3	(a) Describe the use of plastic waste as fillers.	03
	(b) Discuss about Landfill and explain Sanitary Landfill.	04
	(c) Explain the Mitshubishi Reverzer for secondary recycling of plastics with a neat diagram.	07
Q.4	(a) Explain the recycling of PP/HDPE woven sacks to pellets	03
	(b) List and explain the parts of a typical incinerator.	04
	(c) Discuss about different pyrolysis reactors used for the pyrolysis of municipal solid waste.	07
	OR	
Q.4	(a) Discuss the concept of 4 R's in recycling of plastics.	03
	(b) List and explain the environmental implications of recycling and Polymer degradation.	04
	(c) Explain the Union Carbide Cryogenic grinding system for reprocessing of granulating difficult materials.	07

- Q.5** (a) Explain the working of a Klobbie machine used for secondary recycling of plastics. **03**
- (b) Discuss the construction and working of Granulators used in Primary recycling. **04**
- (c) Explain the Secondary Recycling of plastics through Co-Injection molding with a neat diagram. **07**

OR

- Q.5** (a) Draw a line diagram of inline automatic recycling system and explain it briefly. **03**
- (b) Explain the electro dynamic separation technique to separate paper/plastic mixture. **04**
- (c) List the problems encountered in pyrolysis of plastics and explain the working of Union Carbide Pyrolysis system used for continuous pyrolysis of plastics. **07**
