

Enrolment No./Seat No _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024

Subject Code:3152303

Date:02-12-2024

Subject Name:Plastic Recycling & Waste Management

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.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) Define plastic waste. Write importance of plastic recycling.	03
(b) List all key sources of plastics waste with examples.	04
(c) Write the identification (recycling) codes of plastic and give proper example(s) of plastic for each type code.	07
Q.2 (a) Define primary recycling of plastic, and give one example of plastic product, which is recycled using this technique.	03
(b) Write the name of different techniques used for separation/segregation of plastic waste.	04
(c) What is mechanical recycling of plastic? Write different steps involved in mechanical recycling of plastic.	07
OR	
(c) Discuss separation of components of municipal solid refuse.	07
Q.3 (a) What is pyrolysis of plastic waste? What are the different products formed in pyrolysis of plastic?	03
(b) What are the four R's of plastic waste management? Discuss in detail.	04
(c) Write note on "Quaternary Recycling" (Energy Recovery)	07
OR	
Q.3 (a) Write about the use of plastic waste as fillers.	03
(b) Explain life-cycle of plastic product with proper diagram.	04
(c) Discuss on secondary recycling by Co-extrusion and Co-injection Moulding.	07
Q. 4 (a) Write short note on "PET Recycling".	03
(b) Explain the recycling of HDPE containers.	04
(c) Write note on "Incineration of Plastic Waste" and "Plastics in Landfill".	07
OR	
Q. 4 (a) What is degradation of polymers? Briefly write about mechanical degradation of polymers.	03
(b) Describe process for recycling of PP/HDPE woven sacks to pellets	04
(c) What is segregation/separation of plastic waste? Write its significance in plastic recycling. Describe separation method (i.e., X-ray based) used for separation PVC from plastic waste.	07

- | | | |
|-----------|--|----|
| Q. 5 (a) | Why are traces of PVC removed or separated from plastic waste before mechanical recycling? | 03 |
| (b) | Describe recycling of polystyrene. | 04 |
| (c) | Discuss the separation of plastics from plastic-coated fabric | 07 |
| OR | | |
| Q. 5 (a) | What is granulation? Write brief note on plastics granulator. | 03 |
| (b) | Write note on “plastic grinding and shredding”. | 04 |
| (c) | With the neat sketches discuss different reactors used in plastic pyrolysis. | 07 |
