Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– V (New) EXAMINATION – WINTER 2019

Subject Code: 2152303 **Date: 04/12/2019**

Subject Name: Plastics Recycling & Waste Treatment

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.**

			MARKS
Q.1	**(a)**	Define i) Primary Recycling ii) Nuisance Plastics iii) Tertiary Recycling	**03**
	(b)	Write the Recycling codes for i) HDPE ii) PVC iii) PET iv) PP	**04**
	(c)	With a neat flow diagram, explain the flow of plastic products and plastic waste.	**07**
Q.2	**(a)**	List and explain the sources of plastic waste.	**03**
	(b)	Explain about use of plastic waste as fillers in secondary recycling.	**04**
	(c)	Write a short note on the sink-float separation method for separating mixtures of plastics.	**07**
		OR	
	(c)	Explain about granulators used in primary recycling of plastics.	**07**
Q.3	**(a)**	Explain the waste management of plastics with four R's.	**03**
	(b)	Discuss with a neat flow diagram the inline automatic recycling system for primary recycling of waste plastics.	**04**
	(c)	List the methods of separating paper/plastic mixture and explain any one.	**07**
		OR	
Q.3	**(a)**	Explain the properties used as a basis of separation for separating plastic, wood, paper, glass & metallic waste.	**03**
	(b)	List the problems encountered in incineration of pure plastic waste.	**04**
	(c)	With a neat sketch, explain the Union Carbide's cryogenic grinding system used to granulate granulating difficult materials.	**07**
Q.4	**(a)**	Discuss the technical problems encountered in primary recycling of plastics.	**03**
	(b)	Explain the types of pyrolysis system used for pyrolysing municipal solid waste.	**04**
	(c)	How is co-extrusion & co-injection technique helpful in the secondary recycling of plastics.	**07**
		OR	
Q.4	**(a)**	Write a short note on PVS scrap recycling.	**03**
	(b)	What is Landfill? Explain the Sanitary Land filling in brief.	**04**
	(c)	Define pyrolysis. List advantages of Pyrolysis. Write the principal reactions involved in pyrolysis process.	**07**
Q.5	**(a)**	List the technical problems encountered in pyrolysis of plastics.	**03**
	(b)	Explain the recycling of PET by chemical decomposition techniques through tertiary recycling.	**04**

	(c)	Explain the parts of a typical incinerator with a neat sketch.	**07**

OR

Q.5	**(a)**	Explain the recycling of HDPE containers with a flow diagram.	**03**
	(b)	Draw only the flow diagram to separate plastic from plastic coated fibre.	**04**
	(c)	Write a short note on Environmental Implications for recycling of plastics.	**07**

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