Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2172609 Date:28/01/2021

Subject Name:Rubber Recycling & Waste Management

Time:10:30 AM TO 12:30 PM Total Marks: 56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Give the variables which affect the properties of sintered products.	**03**
	(b)	List the disadvantages of the ambient process for the production of crumb rubber.	**04**
	(c)	Explain in detail about Cryogenic process for the production of crumb rubber.	**07**
Q.2	**(a)**	How can you modify ground rubber by the reactive gas treatment?	**03**
	(b)	Give a brief note on modification of ground rubber by interfacial compatibilisation.	**04**
	(c)	Discuss in detail about use of ground rubber in virgin rubber compound.	**07**
Q.3	**(a)**	Define the role of Reclaiming agents and catalysts in reclaiming process.	**03**
	(b)	How the covalent bond energies play a role in sulfur crosslinks scission?	**04**
	(c)	Discuss in detail about the mechanism of reclaiming reaction.	**07**
Q.4	**(a)**	Show the reaction mechanism of the opening of sulfur crosslinks by nucleophilic reagents.	**03**
	(b)	Write in brief about microbiological devulcanisation technique.	**04**
	(c)	Explain in detail about the De-Link process.	**07**
Q.5	**(a)**	What is Rezofan? How crumb rubber is utilized for this application?	**03**
	(b)	Write about the employment of ground rubber for improvement of soil properties.	**04**
	(c)	Mention the basic ways for use of crumb rubber in road pavement construction. Discuss about any one.	**07**
Q.6	**(a)**	Write about the scrap tyre management in production of Flexible fixing structures.	**03**
	(b)	Give the function of cationites. Write about its synthesis from rubber flour.	**04**
	(c)	Discuss the importance of crushed vulcanizates in production of various building materials.	**07**
Q.7	**(a)**	Express the relation between Pyrolysis temperature and vapor residence time during Tyre Pyrolysis.	**03**
	(b)	Draw the diagram for Fluidized bed Pyrolysis reactor and write its working mechanism in brief.	**04**
	(c)	Show the process flow chart for Co-separation process of Tyre Pyrolysis by using single reactor scheme and write its advantage also.	**07**

Q.8 **(a)** Write in brief about Oxidative process of Tyre Pyrolysis. **03**

(b) Mention the advantage of Travelling grate Pyrolysis reactor and draw its schematic diagram. **04**

(c) Draw the basic flow chart showing pyrolytic reprocessing of scrap tyres into marketable products and explain it in detail. **07**

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