Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V(NEW) EXAMINATION – SUMMER 2022

Subject Code:3152601 Date:04/06/2022

Subject Name:Vulcanization

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 the given terms: (i) Optimum Cure (2) Marching (3) Reversion	**03**
	(b)	Compare vulcanized rubber with unvulcanized rubber.	**04**
	(c)	Explain the term 'coefficient of vulcanization'. Also describe the limitations of vulcanization temperature.	**07**
Q.2	**(a)**	List out characteristic properties of unvulcanized rubber. Brief out any one.	**03**
	(b)	Indentify reasons for less solubility of sulphur in rubber phase of latex than aqueous phase.	**04**
	(c)	With labeled diagram, explain the construction and working of Moving Die Rhoemeter (MDR).	**07**
		OR	
	(c)	Explain the chemistry of accelerated sulphur vulcanization with suitable example.	**07**
Q.3	**(a)**	Why sulphur vulcanization is not preferable in case of saturated rubbers?	**03**
	(b)	Classify sulphur cured vulcanization system used for general purpose rubbers. Write on any one with suitable example with desired vulcanizate properties.	**04**
	(c)	Explain in detail about Dithiocarbamate class accelerators.	**07**
		OR	
Q.3	**(a)**	Which major aspects decide the activity of sulfonamide accelerators?	**03**
	(b)	Distinguish the vulcanization properties of Natural Rubber (NR) and Synthetic Rubber (SR).	**04**
	(c)	Explain in detail about 'Thiourea' class accelerators.	**07**
Q.4	**(a)**	What do you mean by mould shrinkage? How it is calculated?	**03**
	(b)	Compare hot air vulcanization with steam vulcanization.	**04**
	(c)	Explain the peroxide vulcanization with its reaction chemistry.	**07**
		OR	
Q.4	**(a)**	Which points are taken in account for optimization of vulcanization system?	**03**
	(b)	Classify methods for assessment of state of cure. Write on any one.	**04**
	(c)	With labeled diagram and reaction chemistry, explain post vulcanization network reactions.	**07**
Q.5	**(a)**	What do you mean by cold cure?	**03**
	(b)	With labeled diagram, write about rotocure curing.	**04**
	(c)	Explain in detail about fluidized bed vulcanization.	**07**
		OR	
Q.5	**(a)**	Which points are taken in account during autoclave curing?	**03**

(b) Indentify advantages of superheated steam vulcanization over saturated steam vulcanization. **04**

(c) Explain detail about microwave vulcanization technique. **07**

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