Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2015

Subject code: 152601 **Date: 02/05/2015**

Subject Name: Vulcanization

Time: 02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions. Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Describe the structure of rubber vulcanizate.	**06**
Q.1	**(b)**	Answer the following	
	i	Differentiate vulcanized rubber and unvulcanized rubber.	**04**
	ii	List the different allotropic forms of sulphur. Write a brief note on any two.	**04**
Q.2	**(a)**	What do you mean by rheograph? Explain the characteristic features of rheograph with its output.	**07**
Q.2	**(b)**	Answer the following	
	i	How an assessment of state of cure is done by physical method?	**04**
	ii	Explain effect of thickness on rate of vulcanization.	**03**
		OR	
Q.2	**(b)**	Answer the following	
	i	How vulcanization of thick rubber article is carried out?	**05**
	ii	Explain effect of temperature on rate of vulcanization.	**02**
Q.3	**(a)**	Discuss in detail about thiazole accelerators.	**07**
Q.3	**(b)**	Answer the following	
	i	Write down the advantages and disadvantages of peroxide cure.	**05**
	ii	Explain in brief about the conventional vulcanization system with suitable example.	**02**
		OR	
Q.3	**(a)**	Discuss in detail about the thiuram accelerators.	**07**
Q.3	**(b)**	Answer the following	
	i	With suitable reaction mechanism, explain peroxide vulcanization of unsaturated rubbers.	**05**
	ii	Explain in brief about the efficient vulcanization with suitable example.	**02**
Q.4	**(a)**	Discuss in detail about the molten salt bath vulcanization technique.	**07**
Q.4	**(b)**	Answer the following	
	i	Explain the effect of crosslink types and structure on the low temperature properties of vulcanizate.	**05**
	ii	Differentiate the scorch and overcure. Which one is preferable? Why?	**02**
		OR	
Q.4	**(a)**	Discuss in detail about the fluidized bed vulcanization technique.	**07**

Q.4	**(b)**	Answer the following	
	i	Explain the effect of crosslink types and structure on abrasion resistance of vulcanizate.	**05**
	ii	Define the given terms: (i) Crosslik Density (ii) Peak Cure	**02**
Q.5	**(a)**	Discuss in detail about the microwave curing.	**07**
Q.5	**(b)**	Answer the following	
	i	How vulcanization is carried out in autoclave?	**05**
	ii	What do you mean by cold cure?	**02**
		OR	
Q.5	**(a)**	Discuss in detail about electron beam vulcanization.	**07**
Q.5	**(b)**	Answer the following	
	i	Write a short note on rotocure.	**04**
	ii	Give the limitations of hot air vulcanization.	**03**

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