Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2014

Subject Code: 152601 **Date: 11-06-2014**

Subject Name: Vulcanization

Time: 10:30 am - 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.**

Q. 1	**(a)i**	Write down the drawbacks of unvulcanized rubber.	**04**
	ii	Define the given terms:(i)Cure Rate (ii) Marching Curve (iii)Reverting Curve	**03**
	(b)	Discuss in detail about the various allotropic forms of sulphur.	**07**
Q. 2	**(a)**	Discuss the continuous method to assess the state of cure.	**07**
	(b)i	Write a short note on vulcanization of thick wall articles.	**05**
	ii	Give the difference between optimum cure and peak cure.	**02**
		OR	
Q. 2	**(b)**	Discuss in detail about the chemistry of sulphur vulcanization.	**07**
Q. 3	**(a)i**	Which points are kept in mind during the compounding of rubber cured by peroxide?	**04**
	ii	When dicumyl peroxide is used as a vulcanizing agent for Natural Rubber, the crosslinking efficiency is 1.0. What does it mean? Also write about its effect on Butyl Rubber.	**03**
Q. 3	**(b)**	Discuss in detail about sulphenamide accelerators.	**07**
		OR	
Q. 3	**(a)i**	With suitable example, explain the peroxide cure of saturated elastomer.	**04**
	ii	What do you mean by co-agent? Write about the role of co-agent with suitable example.	**03**
Q. 3	**(b)**	Discuss in detail about the thiazole accelerators.	**07**
Q. 4	**(a)i**	Explain an importance of accelerator in sulphur vulcanization.	**05**
	ii	Write down the effect of crosslink type and structure on the swelling resistance of vulcanizate.	**02**
Q. 4	**(b)**	Discuss the limitations of vulcanization temperature.	**07**
		OR	
Q. 4	**(a)i**	Which guideline is to be followed during compounding of accelerated sulphur vulcanization?	**05**
	ii	Write down the effect of crosslink type and structure on the hardness of rubber vulcanizate.	**02**
Q. 4	**(b)**	Discuss in detail about the fluidized bed vulcanization.	**07**
Q. 5	**(a)i**	Differentiate hot air vulcanization and steam vulcanization.	**05**
	ii	Write a note on lead curing.	**02**
Q. 5	**(b)**	Discuss in detail about the microwave vulcanization technique.	**07**
		OR	
Q. 5	**(a)i**	Write a short note on rotocure.	**05**
	ii	What do you mean by peachy process?	**02**
Q. 5	**(b)**	Discuss in detail about the liquid curing method.	**07**

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