Seat No.:	Enrolment No.

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

BE – SEMESTER V • EXAMINATION – WINTER - 2012

Subject code: 152601			
Subject Name: Vulcanization Time: 02:30 pm to 05:00 pm			
Instr	1. A 2. N 3. F	ns: Attempt all questions. Make suitable assumptions wherever necessary. Sigures to the right indicate full marks. Vrite the answer to the points.	
Q. 1	(a)	What do you mean by state of cure? Explain the chemical method and physical method to determine the state of cure respectively.	07
Q. 1	(b) i ii	Answer the following What are the advantages of Moving Die Rheometer over Oscillating Disc Rheometer? Explain the basic principle to calculate the degree of shrinkage for rubber vulcanizate.	04 03
Q. 2	(a)	Discuss in detail about the limitations of vulcanization temperature.	07
Q. 2	(b) i ii	Answer the following Write a short note on colloidal sulphur. List the various allotropic forms of sulphur.  OR	05 02
Q. 2	(b) i ii	Answer the following Explain the different vulcanization phases observed during the free heating. List the properties which are optimized in Natural Rubber vulcanizates with short crosslinks.	05 02
Q. 3	(a)	Discuss in detail about the accelerated sulphur vulcanization with its chemistry.	07
Q. 3	(b) i ii	Answer the following How the uniform state of cure can be achieved in thick rubber article? Explain the conventional vulcanization system with suitable example.  OR	04 03
Q. 3	(a)	Describe the guidelines for accelerated sulphur vulcanization formulations.	07
Q. 3	(b) i ii	Answer the following Explain the characteristic properties of unvulcanized rubber compound. Explain the term vulcanite.	05 02
Q. 4	(a)	Write a short note on thiozole accelerators.	07
Q. 4	(b) i ii	Answer the following Why sulphur vulcanization is preferred for diene rubbers instead of peroxides? Which different radiation sources are used in high energy radiation?  OR	04 03
Q. 4	(a)	Discuss in detail about the zinc dithiocarbamate accelerator.	07

Q. 4	(b) i ii	Answer the following Explain the vulcanization of rubber by metal oxides with suitable examples. Which different types of polarization are observed in ultra high frequency vulcanization?	04 03
Q. 5	(a)	Discuss in detail about the fluidized bed vulcanization.	07
Q. 5	<b>(b)</b>	Answer the following	
	i	Draw schematic diagram of rotocure vulcanization technique. Also mention the standard working temperature, pressure and time at which vulcanization is carried out.	04
	ii	Which are the disadvantages of saturated steam vulcanization method?  OR	03
Q. 5	(a)	Explain the influence of compound composition on liquid curing method.	06
Q. 5	<b>(b)</b>	Answer the following	
	i	Write down the merits and demerits of batch vulcanization techniques and continuous vulcanization techniques respectively.	04
	ii	Explain the construction of ultrasonic vulcanization equipment.	04

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