

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – WINTER 2013****Subject Code: 152601****Date: 27-11-2013****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) Differentiate the vulcanization properties of natural rubber and synthetic rubber. **07**

Q.1 (b) With a neat diagram, explain construction and working principle of oscillating disc rheometer. **07**

Q.2 (a) With the suitable examples, discuss the non-sulphur vulcanization of olefine rubbers. **07**

Q.2 (b) Answer the following

- i** Explain the effect of sulphur crosslink structure on the ageing behavior and permanent set of vulcanizate. **04**
- ii** Give the reasons for preference of sulphur vulcanization to diene rubbers. **03**

OR

Q.2 (b) Answer the following

- i** Explain in brief about the effect of sulphur crosslink structure on the dynamic properties of rubber vulcanizate. **05**
- ii** Define the following terms: (i) Coefficient of Vulcanization (ii) Rate of Cure **02**

Q.3 (a) Discuss in detail about thiourea accelerators. **07**

Q.3 (b) Answer the following

- i** Explain importance of organic accelerators in accelerated sulphur vulcanization. **05**
- ii** Write down the mooney- revlin equation to assess the state of cure. **02**

OR

Q.3 (a) Discuss in detail about the amine accelerators. **07**

Q.3 (b) Answer the following

- i** Write a short note on sulphur donors. **05**
- ii** What do you mean by induction time? **02**

Q.4 (a) Describe the reactions which may be envisaged during the peroxide cure. **06**

Q.4 (b) Answer the following

- i** Explain importance of preheating of rubber parts in microwave oven with suitable examples. **04**
- ii** Write about the cold vulcanization methods used to cure thin walled rubber articles. **04**

OR**PTO..**

Q.4	(a)	Describe the efficiency of peroxide with respect to rubber vulcanization.	06
Q.4	(b)	Answer the following	
	i	Explain the working principle of ultrasonic vulcanization technique.	04
	ii	Write about the equipment used for hot air vulcanization.	04
Q.5	(a)	Discuss the limitations of liquid curing method. Also give the main advantages of liquid curing method.	07
Q.5	(b)	Answer the following	
	i	How the vulcanization in water is carried out under atmospheric pressure?	04
	ii	Write a brief note on ballotini.	03
OR			
Q.5	(a)	Describe the continuous vulcanization in steam pipe.	06
Q.5	(b)	Answer the following	
	i	With the neat sketch explain the various vulcanization phases observed during the free heating.	05
	ii	Write a brief note on lead curing.	03
