

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. Sem. - V - Examination – June- 2011****Subject code: 152601****Subject Name: Vulcanization****Date: 20/06/2011****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) Answer the following
- (i) Which structural changes are brought about due to vulcanization of rubber? **04**
- (ii) Explain the efficient vulcanization system and semi-efficient vulcanization system with suitable example. **04**
- (b) Write a short note on structure of rubber vulcanizate. **06**
- Q. 2** (a) Discuss in detail about Oscillating Disc Rheometer with its characteristic features. **09**
- (b) Define the following terms: (i) Post Cure (ii) Peak Cure (iii) Rate of Cure (iv) State of Cure (v) Crosslink Density **05**
- OR**
- (b) Write a short note on various allotropic forms of sulphur. **05**
- Q. 3** (a) Answer the following
- (i) Explain the effect of sulphenamides accelerators on the sulphur vulcanization **04**
- (ii) Explain the effect of temperature and thermal stability on the vulcanization process. **04**
- (b) How vulcanization of thick rubber article is carried out? **06**
- OR**
- Q. 3** (a) Answer the following
- (i) Explain the effect of dithiocarbamate on sulphur vulcanization. **04**
- (ii) How is state of cure determined by chemical method? **06**
- (b) Answer the following
- (i) What do you mean by Dynamic Vulcanization? What is its aim? **02**
- (ii) How many ways the sulphur can combine in vulcanization network? **02**
- Q. 4** (a) Answer the following
- (i) What do you mean by co-agent? Give examples of co-agent. **02**
- (ii) Write a short note on urethane crosslinkers. **04**
- (b) Discuss in detail about the non sulphur vulcanization system for olefin rubber. **08**

OR

- Q. 4 (a)** Explain the effect of crosslink density and crosslink types on the modulus and strength respectively. **06**
- (b)** Answer the following
- (i)** Write down the advantages and disadvantages of peroxide cure. **06**
- (ii)** List the various types of sulphur donors. **02**
- Q. 5 (a)** Write a short note on microwave vulcanization. **08**
- (b)** Answer the following
- (i)** Explain the rotocure vulcanization **04**
- (ii)** Why the ballotini is used as a floating medium in fluidized bed **02**
- OR**
- Q. 5 (a)** Write a short note on electron beam vulcanization. **07**
- (b)** Answer the following
- (i)** How is vulcanization carried out in autoclave. **04**
- (ii)** Write on cold cure. **03**
