

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – SUMMER 2013****Subject Code: 152601****Date: 14-05-2013****Subject Name: Vulcanization****Time: 10:30 pm to 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** How the vulcanized rubber differs from unvulcanized rubber? **04**
 - ii** Give the classification of accelerated sulphur vulcanization system. Which one is preferable? Why? **03**
- Q.1 (b)** List the possible reaction mechanisms for sulphur vulcanization. Discuss any one in detail. **07**
- Q.2 (a)** With neat sketch, discuss the rheograph and related features. **07**
- Q.2 (b)** Answer the following
- i** Write a short note on structure of rubber vulcanizate. **05**
 - ii** Explain the term ebonite. **02**
- OR**
- Q.2 (b)** Answer the following
- i** Write about the construction and working of moving die rheometer. **04**
 - ii** How the cure temperature is determined for thick circular rubber slab? **03**
- Q.3 (a)** Write a short note on thiozole accelerators. **07**
- Q.3 (b)** Answer the following
- i** Explain the effect of crosslink types and crosslink density on modulus and strength of rubber vulcanizate. **05**
 - ii** What do you mean by dynamic vulcanization? **02**
- OR**
- Q.3 (a)** Write a short note on dithiocarbamate accelerators. **07**
- Q.3 (b)** Answer the following
- i** Explain the effect of crosslink types and crosslink density on ageing and fatigue properties of rubber vulcanizate. **04**
 - ii** How an assessment of state of cure is done by physical method? **03**
- Q.4 (a)** Discuss in detail about the advantages and disadvantages of peroxide cure. **07**
- Q.4 (b)** Answer the following
- i** What are the prime requirements for the rubber compound to be cured by microwave vulcanization technique? **04**

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- ii** Explain the principle of ultrasonic vulcanization. **03**

OR

- Q.4 (a)** Discuss the peroxide vulcanization of saturated rubber and unsaturated rubber respectively with suitable examples. **07**
- Q.4 (b)** Write a short note on electron beam vulcanization. **07**
- Q.5 (a)** Discuss in detail about the liquid curing method. **08**
- Q.5 (b)** Answer the following
- i** How the vulcanization is carried out in autoclave? **04**
 - ii** Write a brief note on high velocity gas curing. **02**
- OR**
- Q.5 (a)** Discuss the limitations of vulcanization temperature. **07**
- Q.5 (b)** Answer the following
- i** Write a short note on rotocure. **04**
 - ii** Give the limitations of fluidized bed vulcanization. **03**
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