

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024****Subject Code:3152601****Date:28-11-2024****Subject Name: Vulcanization****Time:10:30 AM 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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1 (a)** Define the given terms: (i)Rate of Cure (ii)State of Cure (iii)Peak Cure **03**
- Q.1 (b)** Differentiate unvulcanized rubber and vulcanized rubber. **04**
- Q.1 (c)** Explain in detail about vulcanization conditions. **07**
- Q.2 (a)** What do you mean by ‘Vulcanite’? **03**
- Q.2 (b)** List major components of structure of rubber vulcanizate. Write on any two. **04**
- Q.2 (c)** Explain in detail about the methods used to obtain uniform vulcanization throughout thick sectioned rubber articles. **07**
- OR**
- Q.2 (c)** With labeled diagram, explain the rheograph with it’s key features. **07**
- Q.3 (a)** Show reasons for preference of sulphur vulcanization to diene rubbers. **03**
- Q.3 (b)** Identify role of accelerators in sulphur vulcanization with suitable examples. **04**
- Q.3 (c)** Explain in detail about the ‘Dithiocarbamate’ type accelerators. **07**
- OR**
- Q.3 (a)** What is full form of ‘PVI’? Also brief out it’ role in vulcanization process. **03**
- Q.3 (b)** Compare Conventional Vulcanization (CV) system with Efficient Vulcanization (EV) system suitable example. **04**
- Q.3 (c)** Explain in detail about the ‘Thiuram’ type accelerators. **07**
- Q.4 (a)** What do you mean by ‘co agent’? What is its role? **03**
- Q.4 (b)** Categorize effect of cure system on crosslink types and vulcanization properties. **04**
- Q.4 (c)** With suitable reaction chemistry, explain vulcanization of non-sulphur vulcanization of non-olefin rubber. **07**
- OR**
- Q.4 (a)** Which rubber is cured by Quione Dioxime? Why? **03**
- Q.4 (b)** Give the advantages of jacketed autoclave over un jacketed autoclave. Also name the products which can be cured in autoclave. **04**
- Q.4 (c)** With suitable reaction chemistry, explain vulcanization of non-sulphur vulcanization of olefin rubber. **07**
- Q.5 (a)** How o state of cure is assessed by Mooney-Revlin equation? **03**
- Q.5 (b)** Identify advantages of Liquid Curing Method (LCM) over autoclave. Also brief out them. **04**
- Q.5 (c)** With schematic diagram, explain rotocure vulcanization technique. **07**
- OR**
- Q.5 (a)** Tell principle of ‘Microwave Vulcanization’ technique. **03**
- Q.5 (b)** Identify the requirements to be followed during compounding of products to be cured by microwave vulcanization technique. **07**
- Q.5 (c)** Explain in detail about water cure. **07**

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