

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- V EXAMINATION-SUMMER 2023

Subject Code: 3152601

Date: 26/06/2023

Subject Name: Vulcanization

Time: 02:30 PM TO 05:00 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)Vulcanization (ii)Vulcanizate (iii)Rate of Cure **03**
(b) Indentify drawbacks of unvulcanized rubber. **04**
(c) With schematic diagram, explain the major components of structure of rubber vulcanizate. **07**
- Q.2** (a) List out different allotropic forms of sulphur. Brief out any one. **03**
(b) Differentiate the Vulcanization properties of Natural Rubber (NR) and Synthetic Rubber (SR). **04**
(c) Explain the construction and working of Moving Die Rheometer (MDR). **07**
- OR**
- Q.2** (c) Explain the limitations of vulcanization temperature. **07**
- Q.3** (a) What do you mean by sulphur donors? Give any two examples with their structure. **03**
(b) Which points are taken in account before selecting an accelerator system for manufacturer of particular rubber product? **04**
(c) Explain in detail about the sulphenamide type accelerators. **07**
- OR**
- Q.3** (a) With schematic diagrams, show the role of retarder in vulcanization process. **03**
(b) Classify the accelerated sulphur vulcanization system. Also outline any one with suitable example. **04**
(c) Explain in detail about the amine type accelerators. **07**
- Q.4** (a) Which rubber is cured by metal oxide? Why? **03**
(b) Give the advantages of peroxide cure over sulphur curing. **04**
(c) Explain in detail about autoclave curing. **07**
- OR**
- Q.4** (a) Which rubber is cured by phenolic resin? Why? **03**
(b) Give the advantages of superheated steam over saturated steam with respect to vulcanization process. **04**
(c) Explain in detail about fluidized bed vulcanization. **07**
- Q.5** (a) What do you mean by pressurized vulcanization technique? Also give it's examples. **03**
(b) With labeled diagram, write about rotocure. **04**
(c) Explain in detail about microwave vulcanization technique. **07**

OR

- Q.5** (a) What do you mean by pressure less vulcanization technique? Also give it's examples. **03**
(b) Compare hot air vulcanization with steam vulcanization. **04**
(c) Explain in detail about electron beam vulcanization technique. **07**
