

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - V EXAMINATION - SUMMER 2025

Subject Code: 3152601

Date: 15-05-2025

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.**

	Marks
Q.1 (a) Define the given terms: (i) Plateau (2) Reversion (3) Marching	03
(b) Distinguish vulcanized rubber and unvulcanized rubber.	04
(c) Explain effect of type of crosslink on the properties of rubber vulcanizate.	07
Q.2 (a) Which points are taken in account to carry out the optimum vulcanization of rubber?	03
(b) Identify properties of unvulcanized rubber compound. Also elaborate them.	04
(c) Explain the radical mechanism associated with sulphur vulcanization of Natural Rubber (NR).	07
OR	
(c) Explain ionic mechanism associated with sulphur vulcanization of Natural Rubber (NR).	07
Q.3 (a) What is effect of material thickness on the rate of vulcanization?	03
(b) Compare CV(Conventional Vulcanization) system with EV(Efficient Vulcanization) system. Also give suitable examples for the same.	04
(c) Explain in detail about 'Dithiocarbamate' class accelerators.	07
OR	
(a) What is effect of temperature on the rate of vulcanization?	03
(b) Classify accelerators with single example with its structure.	04
(c) Explain in detail about 'Thiuram' class accelerators.	07
Q.4 (a) Which vulcanizing agent is chosen to cure 'Butyl Rubber' (IIR)? Why?	03
(b) Compare pressurized vulcanization technique with pressure less vulcanization technique.	04
(c) Explain in detail about the reaction mechanism of peroxide cure with suitable example.	07
OR	
(a) Which vulcanizing agent is chosen to cure 'Nitrile Rubber'? Why?	03

- (b)** Compare batch vulcanization technique with continuous vulcanization technique. **04**
- (c)** Explain in detail about major issues associated with peroxide curing. **07**
- Q.5 (a)** What do you mean by half life with respect to peroxide cure? How is it determined? **03**
- (b)** Simply physical method to assess the state of cure of any rubber vulcanizate. **04**
- (c)** Explain in detail about vulcanization in microwave vulcanization technique. **07**

OR

- (a)** What are key benefits of peroxide cure? **03**
- (b)** Simplify chemical method to assess the state of cure of any rubber vulcanizate. **04**
- (c)** Explain in detail about electron beam vulcanization technique. **07**
