

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2023

Subject Code:3152601

Date:07-12-2023

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) Thermoplasticity (2) Induction Time (3) Scorch Time **03**
(b) Distinguish vulcanization properties of Natural Rubber (NR) and Synthetic Rubber (SR). **04**
(c) Explain the effect of vulcanization temperature on performance and properties of vulcanization process and vulcanizate respectively. **07**
- Q.2** (a) What do you mean by polymeric sulphur? Give it's example with key properties. **03**
(b) Compare performance of Oscillating Disc Rheometer (ODR) with Moving Die Rheometer (MDR). **04**
(c) With labeled diagram, explain major components of structure of rubber vulcanizate. **07**
OR
(c) Explain in detail about the classification of accelerated sulphur vulcanization system. **07**
- Q.3** (a) What is practical significance of sulphur donor in vulcanization process? **03**
(b) Outline the importance of accelerators in sulphur vulcanization. **04**
(c) Explain Dithiocarbamate class accelerators with it's major features. **07**
OR
- Q.3** (a) Selenium as well as Tellurium are not chosen as vulcanizing agent, though they find their position similar to that of sulphur-Justify this statement. **03**
(b) With schematic diagram, analyze the role of Pre Vulcanization Inhibitor (PVI) in vulcanization process. Also give its single example with structure. **04**
(c) Explain amine class accelerators with it's major features. **07**
- Q.4** (a) Which organic peroxides are most popularly used in rubber industry? Also give it's key properties. **03**
(b) How the vulcanization of polychloroprene or neoprene is carried out? **04**
(c) With suitable reaction chemistry, explain the peroxide vulcanization of olefin rubber. **07**
OR
- Q.4** (a) What do you mean by coagent? What is it's role in peroxide vulcanization? **03**
(b) Identify the role of Phenol Formaldehyde resin in vulcanization of rubber with suitable example. **04**
(c) With suitable reaction chemistry, explain the peroxide vulcanization of non- olefin rubber. **07**
- Q.5** (a) Which different types of rubber products are cured by means of autoclave? **03**
(b) Classify water vulcanization technique. Write on any one. **04**
(c) Explain construction and working of microwave assembly used in rubber vulcanization. **07**

OR

Q.5	(a)	Which different types of rubber products are cured by means of rotocure?	03
	(b)	Differentiate hot air vulcanization and steam vulcanization.	04
	(c)	Explain principle, construction and working of fluid bed assembly used in rubber vulcanization.	07
