Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering - SEMESTER - IV EXAMINATION - WINTER 2025

Subject Code: 3142608 **Date: 24-11-2025**

Subject Name: Textile & Metal Reinforcement of Elastomers

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.**

			Marks
Q.1	**(a)**	Classify textile fibers used in industrial applications.	**03**
	(b)	Define fiber morphology. Explain its effect on fiber performance.	**04**
	(c)	Explain about the Production & properties of Nylon and Polyester fibers.	**07**
Q.2	**(a)**	List the properties requirements of industrial textile yarns.	**03**
	(b)	Describe the production method of Rayon fiber.	**04**
	(c)	Explain the production of textile cords & role in composites.	**07**
		OR	
	(c)	Describe the chemical & physical properties, advantages, limitations of Aramid fiber.	**07**
Q.3	**(a)**	List the Non-woven fabrics & its industrial advantages.	**03**
	(b)	Write the design parameters of woven fabrics.	**04**
	(c)	Explain the production of single-end reinforcement fiber with schematic diagram.	**07**
		OR	
	(a)	Define Crimp and Twist with significance.	**03**
	(b)	Differentiate between woven, non-woven and knitted structures.	**04**
	(c)	Explain about the Moisture Regain, Modulus, and Hysteresis of Textiles.	**07**
Q.4	**(a)**	What is Adhesion? Explain basic principles of textile–rubber adhesion.	**03**
	(b)	Explain the latex proofing & coating of textiles.	**04**
	(c)	List the adhesion test methods and explain any one in detail.	**07**
		OR	
	(a)	Explain Ballistic adhesion test method.	**03**
	(b)	Explain the Dead-weight peeling & direct tension testing.	**04**
	(c)	Describe the Peel tests for heavy fabrics & multi-ply.	**07**
Q.5	**(a)**	What is Corona discharge treatment?	**03**

(b)	Write steps for metal cleaning for rubber to metal bonding.	**04**
(c)	Describe the rubber–metal bonding process in detail.	**07**

OR

(a)	Explain the corrosion & its effect on adhesion.	**03**
(b)	Compare the Acid Etching and Plasma treatment.	**04**
(c)	Explain about the wet-blast preparation and phosphating process.	**07**

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