

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering - SEMESTER - IV EXAMINATION - SUMMER 2025

Subject Code: 3142608

Date: 19-05-2025

Subject Name: Textile & Metal Reinforcement of Elastomers

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.

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	Marks
Q.1 (a) What is Linear Density? Write its unit and significance.	03
(b) Draw the schematic diagram showing basic classification of fibers.	04
(c) Describe the single end cord treatment process using heat setting machinery.	07
Q.2 (a) Give schematic representation for Melt Spinning process.	03
(b) Give reaction mechanism for synthesis of Nylon. Write the structural difference between Nylon and Nylon 66.	04
(c) Explain the extrusion processing for the Short Fiber- Rubber Composites.	07
OR	
(c) Name the method used for production of Rayon. Explain the process with schematic diagram.	07
Q.3 (a) Write about significance of Twist for yarn. Mention the formula for tpm.	03
(b) Represent any two weave designs for Stress Warp fabric structures.	04
(c) Show the Principal of Weaving with diagram and explain in detail.	07
OR	
(a) Write advantages and disadvantages of Knitting.	03
(b) Write about the Fabric designation system. Explain with any one example.	04
(c) Mention the methods for manufacturing of Non-woven fabric. Describe any two in detail.	07
Q.4 (a) Describe the peeling by dead weight loading test used to evaluate fabric-to-rubber adhesion.	03
(b) Explain the concept of non-standard peel tests in rubber-to-metal bonded systems.	04
(c) Analyze the role of the interfacial region in short fiber composites.	07

OR

- (a) List the applications of short fiber rubber composites. 03**
- (b) Draw the schematic representation of tensile and shear stress distribution along a short fiber length in rubber composites. 04**
- (c) Explain peeling as a viscoelastic process in the context of rubber to fabric adhesion testing. 07**

- Q.5**
- (a) Draw the schematic diagram for the mechanism of bonding process. 03**
 - (b) Define the term: (i) Warp (ii) Fiber (iii) Peel Strength and (iv) Adhesion. 04**
 - (c) Discuss in detail the advantages of a Wet Blast Phosphating Plant. 07**

OR

- (a) How is the Wet Blasting done? 03**
- (b) List the ASTM standardized basic categories of bond failure. 04**
- (c) List the Chemical treatment for the Rubber to Metal Bonding. Explain any on in detail. 07**
