Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160112 Date: 26-05-2025

Subject Name: Composite Materials

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.**

			MARKS
Q.1	**(a)**	What is composite material? Classify Constituent materials.	**03**
	(b)	What is the need of Composite materials in the field of Aviation?	**04**
	(c)	Derive equations for volume and weight fractions.	**07**
Q.2	**(a)**	What is the mechanical behavior of composite materials?	**03**
	(b)	Compare Polyester resins with Epoxy resins.	**04**
	(c)	Derive In plane Shear modulus with neat sketch.	**07**
		OR	
	(c)	Determine the transverse modulus of a unidirectional lamina with neat sketch.	**07**
Q.3	**(a)**	What is FRP?	**03**
	(b)	Which metals are use in aerospace industry?	**04**
	(c)	Identify of laminate. 1. [90|0] 2. [45|0|-45] 3. ['±30] 4. [0|90|0|90] 5. [60|02|60] 6. [20|45|-20|-45] 7. [0|90]S	**07**
		OR	
Q.3	**(a)**	The E-glass fibre in a polyester resin is 35% by weight. Given ρf = 2.50 gm/ml and ρm = 1 gm/ml. Calculate Vf and ρc for the lamina.	**03**
	(b)	Explain Carbon fibres	**04**
	(c)	Stress-strain relation of specially Orthotropic Material.	**07**
Q.4	**(a)**	Define Lamina and laminate.	**03**
	(b)	What is the need of Fillers? Explain in details.	**04**
	(c)	Explain about super Alloys.	**07**
		OR	
Q.4	**(a)**	How many numbers of independent elastic constants for monoclinic material?	**03**
	(b)	What do you mean by balanced laminate?	**04**
	(c)	Explain stress-strain relation of an Isotropic Material.	**07**
Q.5	**(a)**	What is the application of laminated composite?	**03**
	(b)	What are the basic assumptions for analysis of laminated composites?	**04**
	(c)	Discuss in details anti symmetric laminates.	**07**
		OR	
Q.5	**(a)**	What are the properties of composite laminates?	**03**
	(b)	Write in detail classification of laminates.	**04**
	(c)	Derive Strain-Displacement relationship of a laminate along with neat sketch stating all the necessary assumptions.	**07**

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