Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2023

Subject Code:3160112 Date:10-07-2023

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)**	Define Lamina and laminate.	**03**
	(b)	What is FRP? Write characteristics and advantages of FRPs.	**04**
	(c)	Derive Longitudinal Strength and stiffness for composite ?	**07**
Q.2	**(a)**	Why are Composites used in Aerospace?	**03**
	(b)	Discuss the various applications of composite materials.	**04**
	(c)	Derive Volume and Weight fraction for composite ?	**07**
		OR	
	(c)	Discuss in details anti symmetric laminates.	**07**
Q.3	**(a)**	Write a note on Poisson's ratio with reference of composite material.	**03**
	(b)	Define a composite material and give its classification in detail.	**04**
	(c)	Describe the behavior of Young's modulus Ex, Ey and Shear modulus Es with orientation angle.	**07**
		OR	
Q.3	**(a)**	What is prepegs?	**03**
	(b)	What is a composite material?	**04**
	(c)	Write short notes. 1) Types of fiber. 2) Types of matrix.	**07**
Q.4	**(a)**	Explain stress-strain relation of an Isotropic Material.	**03**
	(b)	Explain particulate and fiber reinforced composite materials.	**04**
	(c)	Derive inplane shear modulus for unidirectional lamina.	**07**
		OR	
Q.4	**(a)**	What are the most widely used metal material for aircraft construction?	**03**
	(b)	Write a note on Equilibrium equations.	**04**
	(c)	Derive Strain-Displacement relationship of a laminate along with a neat sketch stating all the necessary assumptions.	**07**
Q.5	**(a)**	What is the need of Fillers? Explain in details.	**03**
	(b)	What is transformation of stress and strain?	**04**
	(c)	Explain different types of thermoset polymers.	**07**
		OR	
Q.5	**(a)**	How many number of independent elastic constants for monoclinic material?	**03**
	(b)	Write a note on Equilibrium equations.	**04**
	(c)	Explain different types of fibers.	**07**

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