Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER • 2015

Subject Code: 170103 **Date:14 /05/2015**

Subject Name: Mechanics of Composite Materials

Time: 02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define composite materials. Write a note on different types of composite materials.	**07**
	(b)	Explain the applications of composite materials in various fields.	**07**
Q.2	**(a)**	Define: Ply, Principal axis, Reference axis, In-plane stress, On-axis system, Orthotropic material, Transversely isotropic material.	**07**
	(b)	Write a note on anisotropic material. State Clark-Maxwell theorem.	**07**
		OR	
	(b)	Write a note on Stress-Strain relations of a thin lamina.	**07**
Q.3	**(a)**	Define Off-axis system. Derive the relationship between principal axis and reference axis of stress for a unidirectional lamina.	**07**
	(b)	Write a note on constituents of fibre reinforced composite materials.	**07**
		OR	
Q.3	**(a)**	Define stress resultants and write a note on laminate stiffness.	**07**
	(b)	What do you mean by failure in materials? Explain the use of failure criteria.	**07**
Q.4	**(a)**	Explain aramid fibres and glass fibres along their applications.	**07**
	(b)	Explain strain-displacement relationship for a laminate along with all the assumptions.	**07**
		OR	
Q.4	**(a)**	Explain Poission's ratio and explain Poission's mismatch effect.	**07**
	(b)	Write a note on volume and weight fractions.	**07**
Q.5	**(a)**	Write note on types of laminates.	**07**
	(b)	Write a note on Maximum Stress theory.	**07**
		OR	
Q.5	**(a)**	Write the types of local failure modes at micro-level. Explain longitudinal tension.	**07**
	(b)	Explain failure in transverse tension and compression.	**07**

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