Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code: 170103 **Date: 09/12/2015**

Subject Name: Mechanics of Composite Materials

Time: 10:30am to 1:00pm **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. Classify and explain types of composite materials.	**07**
	(b)	Explain the applications of composite materials in different fields.	**07**
Q.2	**(a)**	Define and explain a lamina and laminate with necessary sketches.	**07**
	(b)	What do you understand by mechanical behavior of composite materials?	**07**
		OR	
	(b)	What are the properties of composite materials? How they help for selection of composite material.	**07**
Q.3	**(a)**	Discuss elastic properties of unidirectional laminate and explain its engineering constants.	**07**
	(b)	Explain transverse modulus and in-plane shear modulus.	**07**
		OR	
Q.3	**(a)**	Derive longitudinal strength of a lamina.	**07**
	(b)	Explain transformation of strain and stress in detail.	**07**
Q.4	**(a)**	Derive the laminate stiffness; [A], [B], and [D]. Start from in plane forces and moments of a laminates.	**07**
	(b)	Write a short note on symmetric laminates.	**07**
		OR	
Q.4	**(a)**	Derive strain displacement relationship in detail and also explain the significance of each term.	**07**
	(b)	Write a short note on anti-symmetric laminates.	**07**
Q.5	**(a)**	Explain failure in transverse tension and compression.	**07**
	(b)	Explain Poisson's ratio and Poisson's mismatch effect.	**07**
		OR	
Q.5	**(a)**	Write a short note on micromechanics of failure of unidirectional lamina including longitudinal compression.	**07**
	(b)	What do you mean by failure in materials? Explain the use of failure criteria.	**07**

****