Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2014

Subject Code: 150106 **Date: 24-06-2014**

Subject Name: Composite material and smart structures

Time: 10.30 am - 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.**

Q.1	**(a)**	Briefly explain about composite materials and compare the characteristics of composite materials with metallic materials.	**07**
	(b)	Give the detail classification of composite on the basis of matrix material and reinforcing element.	**07**
Q.2	**(a)**	Enlist the properties of Poly-Ether-Ether-Ketone (PEEK) as a matrix material.	**07**
	(b)	Explain about the micro electro mechanical systems (MEMs) and list its application.	**07**
		OR	
	(b)	Explain about Acoustic Emission (AE) Techniques.	**07**
Q.3	**(a)**	Explain about magnetostrictive materials and discuss its applications.	**07**
	(b)	Describe the metal matrix composite material.	**07**
		OR	
Q.3	**(a)**	List the different materials used as a fiber in a composite material and explain properties of boron fiber.	**07**
	(b)	Explain about A-scan, B-scan and C-scan.	**07**
Q.4	**(a)**	Explain the stress stain law for a single ply in laminate axes for off-Axis Laminates.	**07**
	(b)	Describe with neat sketch, the different wave pattern of fibers used in composite.	**07**
		OR	
Q.4	**(a)**	Explain about self-healing composite material.	**07**
	(b)	List the criteria used during ply orientation in laminate composite and explain about symmetric lay up with coding.	**07**
Q.5	**(a)**	Describe the statistical analysis of tensile strength for fiber composite material.	**07**
	(b)	Explain the Tsai-Wu tensor failure criteria in detail.	**07**
		OR	
Q.5	**(a)**	Explain the stress concentration and edge effect.	**07**
	(b)	Explain buckling of laminates and buckling of fibers.	**07**

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