Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – WINTER • 2014

Subject Code: 150106 **Date: 08-12-2014**

Subject Name: Composite Materials and Smart Structure

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)**	Define composite material and give its detail classification.	**07**
	(b)	Explain shape memory alloy. Enlist its advantages.	**07**
Q.2	**(a)**	Enlist the different types of fibers and list its properties and application.	**07**
	(b)	Write a short note on micro electro mechanical systems (MEMs).	**07**
		OR	
	(b)	Write a short note on filament winding method	**07**
Q.3	**(a)**	Classify the materials on the basis of mechanical properties & explain in brief.	**07**
	(b)	Derive reduced stiffness and compliance matrix for a thin lamina.	**07**
		OR	
Q.3	**(a)**	Explain about Transformation of stress and strain.	**07**
	(b)	Explain maximum stress and strain theory.	**07**
Q.4	**(a)**	Write a short note on smart materials.	**07**
	(b)	Explain piezoelectric materials and write its application.	**07**
		OR	
Q.4	**(a)**	What is electrorheological (ER) effect? Explain ER fluids.	**07**
	(b)	Write a short note on pultrusion method.	**07**
Q.5	**(a)**	Derive the equation for Inplane shear modulus.	**07**
	(b)	Write a properties of cross & angle ply laminate.	**07**
		OR	
Q.5	**(a)**	Describe with neat sketch, the different wave pattern of fibers used incomposite.	**07**
	(b)	Write a short note on lamina & Laminate.	**07**

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