Seat No.:	Enrolment No
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## **GUJARAT TECHNOLOGICAL UNIVERSITY**

Sı	ıbjec	BE - SEMESTER-V (OLD) - EXAMINATION – SUMMER 2017 et Code: 150106 Date: 15/05/20 et Name: Composite Materials and Smart Structures (Institute ve - II)	)17
Ti		02:30 PM to 05:00 PM Total Marks:	70
111		Attempt all questions.	
Q.1	(a) (b)	What is Composite Material? Classify it based on reinforcing element. What is Smart Systems and Smart Material? Write an Applications of Smart Materials.	07 07
Q.2	(a) (b)	Explain about Micro Electromechanical systems (MEMs). State its advantages and applications.  Explain the stress stain law for a single ply in laminate axes for off-Axis Laminates.	07 07
	<b>(b)</b>	OR Explain buckling of laminates and buckling of fibers.	07
Q.3	(a) (b)	Describe with neat sketch, the different wave pattern of fibers used in composite.  Explain the stress-strain relationships of a thin lamina.  OR	07 07 07
Q.3	(a) (b)	Enlist the different properties of epoxies as a matrix material.  Write a short note on Magnetostrictive materials and its applications.	07 07
Q.4	(a) (b)	What do you mean by smart fluid? Explain about ER fluid and MR fluid. Write a note on Shape Memory Alloy (SMA) and state its applications and advantages.	07 07
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Q.4	<ul><li>(a)</li><li>(b)</li></ul>	List the various manufacturing processes of composite and explain about filament winding process.  Enlist the assumption taken in laminate theory and state the stress strain law for single ply in the material axes for unidirectional laminate.	07 07
Q.5	(a) (b)	Explain about Symmetric Laminates and Balanced laminates.  Explain about Self-healing composite materials.  OR	07 07
Q.5	(a) (b)	Explain about Acoustic Emission (AE) Techniques. List the different materials used as a fiber in a composite material and explain properties of boron fiber.	07 07

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