

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
B.E SEM-V Examination-Nov/Dec.-2011

Subject code: 150106

Date: 03/12/2011

Subject Name: Composite Material and Smart Structures

Time: 02.30 pm-05.00 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) Explain about composite materials and write advantages and disadvantages of it. **07**
- (b) List the different materials used as a fiber in a composite materials. Explain about different composition used for a glass fiber. **07**
- Q.2** (a) What do you understand by smart material? And enlist different smart Materials and explain about them in brief. **07**
- (b) Explain about Acoustic Emission (AE) Techniques. **07**
- OR**
- (b) Explain about A-scan, B-scan and C-scan. **07**
- Q.3** (a) Explain about Micro Electromechanical systems (MEMs). State its advantages and applications. **07**
- (b) Explain about Magnetostrictive materials. And write its applications. **07**
- OR**
- Q.3** (a) Explain about Shape Memory Alloy (SMA) and state its applications and advantages. **07**
- (b) What do you mean by smart fluid? Explain about ER fluid and MR fluid. **07**
- Q.4** (a) Enlist the properties and application of Carbon fiber. **07**
- (b) Enlist important properties of PEEK as a matrix material. **07**
- OR**
- Q.4** (a) Explain about different metal used in MMC. **07**
- (b) Explain wave pattern of fibers with sketch. **07**
- Q.5** (a) Explain about Cross Laminates and Angle Ply laminates. **07**
- (b) Explain the stress stain law for a single ply in laminate axes for off-Axis Laminates. **07**
- OR**
- Q.5** (a) Explain the edge effect for laminate with neat sketches. **07**
- (b) Briefly Explain about Finite Element Solution Process. **07**
