

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V • EXAMINATION – SUMMER 2013

Subject Code: 150106**Date: 23-05-2013****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) Compare the characteristics of composite materials with metallic materials. **07**
- (b) Explain about composite material and Give the detail Classification of composite on the basis of matrix material. **07**
- Q.2** (a) Explain about Smart Materials and smart Systems? Explain about Piezoelectric material. **07**
- (b) Explain about A-scan, B-scan and C-scan. **07**
- OR**
- (b) Explain about Acoustic Emission (AE) Techniques. **07**
- Q.3** (a) Give the name of commercially available aramid fibers and enlist the properties and application of aramid fibers. **07**
- (b) Describe the ceramic matrix composite material. **07**
- OR**
- Q.3** (a) Explain about hybrid fibers and its combinations in detail. **07**
- (b) Enlist the different properties of epoxies as a matrix material. **07**
- Q.4** (a) Write short-note on self-healing composite. **07**
- (b) Explain about Micro Electromechanical systems (MEMs). State its advantages and applications. **07**
- OR**
- Q.4** (a) What do you mean by smart fluid? Explain about ER fluid and MR fluid. **07**
- Q.4** (b) Explain about Shape Memory Alloy (SMA) and state its applications and advantages. **07**
- Q.5** (a) Enlist the assumption taken in laminate theory and state the stress strain law for single ply in the material axes for unidirectional laminate. **07**
- (b) Explain Longitudinal Modulus and Transverse Modulus of unidirectional lamina for composite material. **07**
- OR**
- Q.5** (a) Explain the Stress concentration for laminate with neat sketches. **07**
- (b) Explain about Symmetric Laminates and Balanced laminates. **07**
