

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER V • EXAMINATION – WINTER - 2012****Subject code: 150106****Date: 23-01-2013****Subject Name: Composite Materials and Smart Structures****Time: 02:30 pm to 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 material and give its detail classification. **07**
(b) Compare the characteristics of composite materials with metallic materials. **07**

- Q.2** (a) Describe about the micro electro mechanical systems (MEMs). **07**
(b) Explain buckling of laminates and buckling of fibers. **07**

OR

- (b) What is the meaning of shape memory alloy? Enlist its advantages. **07**

- Q.3** (a) Classify the aramid fibers and list its properties and application. **07**
(b) Explain the function of matrix material in a composite. **07**

OR

- Q.3** (a) Differentiate the thermosets and thermoplastics. **07**
(b) Describe about the metal matrix composite material. **07**

- Q.4** (a) Explain about symmetric lay-up code with suitable example. **07**
(b) Explain the stress strain law for a single ply in the material axes for unidirectional laminates. **07**

OR

- Q.4** (a) Explain major poisson's ratio and in-plane shear modulus of fiber composite material. **07**
(b) Describe the stress concentration around holes in orthotropic laminate composite material. **07**

- Q.5** (a) Write the short note on edge effects of composite material. **07**
(b) Describe the statistical analysis of tensile strength for fiber composite material. **07**

OR

- Q.5** (a) What is the meaning of smart material? Explain different types of smart material. **07**
(b) Describe the fracture mechanics of fiber composite material. **07**
