

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

Subject Code: 182103**Date: 09/05/2013****Subject Name: Composite Material****Time: 10:30 am TO 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 materials in brief and state reasons with suitable examples - Why composite materials are the best suitable for the advanced applications. **07**
- (b)** Give detailed classification of composites on the basis of their construction. **07**
- Q.2 (a)** Draw labeled sketch and give suitable examples, Dispersion strengthening and Particulate strengthened composites. **07**
- (b)** Write Properties & Application of Carbon-fiber, Glass Fiber and Aramid fiber reinforced composites. **07**

OR

- (b)** A composite made from 64 % volume of Glass fiber & epoxy resin. For Epoxy, $E = 34 \times 10^2$ MPa, T.S = 62 MPa & glass fiber $E = 76.5 \times 10^3$ MPa & T.S.= 2613 MPa. Evaluate, 1. E & T.S. of composite material 2. Load shared by Two Phases, Load is in direction of alignment of fiber. **07**
- Q.3 (a)** What is critical fiber length? Distinguish between Optimal, Short & Continuous size fiber. **07**
- (b)** Compare Properties of Metal Matrix composite & Ceramic Matrix composites. **07**

OR

- Q.3 (a)** Describe with neat sketch the following reinforcements (i) Particulates (ii) Flakes (iii) Whiskers (iv) Prepregs **07**
- (b)** Briefly describe Sandwich Panels and explain prime reason for fabricating these structural composites. **07**
- Q.4 (a)** Explain reasons why glass fibers are most commonly used for reinforcement and Why is the surface perfection of glass fibers so important? **07**
- (b)** Explain the role of interfaces in composites and explain various types of interfaces developed in the composite. **07**

OR

- Q.4 (a)** Explain with schematic Pultrusion Process of fabricating Polymer matrix composite. **07**
- Q.4 (b)** Explain with Schematic Vacuum Bag assembly process of manufacturing of composite. **07**
- Q.5 (a)** Briefly describe Sandwich Panels and explain prime reason for fabricating these structural composites. **07**
- (b)** Explain the role of fiber & Matrix materials in composite. **07**
- OR**
- Q.5 (a)** Explain with Neat schematic the filament winding process & the components/parts being manufactured using this method. **07**
- (b)** Mention various strengthening Mechanisms in composite and explain any one. **07**
