

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VI • EXAMINATION – SUMMER • 2014**

**Subject Code: 163406****Date: 30-05-2014****Subject Name: Composite Technology****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) Define a composite material? What are its advantages? Mention a few important applications sector wise where it is being used? **07**
- (b) Classify composite materials based on the matrix used and based on the fibers used? What kind of materials should be chosen to make a composite? Answer this on the basis of properties. **07**
- Q.2** (a) Write about the structure & properties of epoxy resin? Also mention its drawbacks? List a few application areas where it is used? **07**
- (b) Differentiate between natural and synthetic fibers? Mention a list of both? What do you mean by a preform and a prepreg? **07**
- OR**
- (b) Discuss about the properties of carbon fiber? Also discuss the process by which it is manufactured? What are its advantages over the other fibers in terms of cost and properties? **07**
- Q.3** (a) Write about the glass fibers? Mention few commercially available glass fibers? List the applications where they are being used? **07**
- (b) Write in detail about the silicon carbide and boron fibers? Give a list of application areas where they are being used? **07**
- OR**
- Q.3** (a) Write about jute and sisal fibers? Comment on their properties and advantages over other fibers? **07**
- (b) Describe the Resin Transfer Molding (RTM) process with a neat sketch and label its parts? List the RTM products which are used in different sectors? **07**
- Q.4** (a) Write in detail about the filament winding process and explain it with a neat sketch? What kinds of products are made by this process? **07**
- (b) Explain in detail the pultrusion process with a neatly labeled sketch? What are its advantages and disadvantages? **07**
- OR**
- Q.4** (a) What is the need of additives in composite material manufacturing? Name a few important additives used? Also mention their role? **07**
- (b) What are coupling agents? What is their primary role? Give their structure? In what amounts are they used? **07**
- Q.5** (a) Write about UV stabilizers, flame retardants and toughening agents with examples? **07**
- (b) What is shelf life & gel time? How do you determine the shelf life and gel time? What is the need to determine? **07**
- OR**
- Q.5** (a) What is the need to conduct non-destructive testing? What are the various methods used for non-destructive testing? Write about any one method? **07**

- (b)** Write about the industry need of aerospace sector in terms of property? What are the challenges faced by this industry? Can composite materials cater the needs of this industry? If yes, then mention few examples of polymer matrix composites being used in this industry along with the application area? **07**

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