

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-IV EXAMINATION – WINTER 2015**

**Subject Code: 143605****Date: 06/01/2016****Subject Name: Composite Materials****Time: 02:30pm to 05:00pm****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 the synthesis of unsaturated polyester with necessary chemical reactions. 07  
(b) Explain the applications of composite materials in various fields in brief. 07

- Q.2 (a) Define and explain in brief the following terms with examples: 02  
i.) Reinforcement 02  
ii.) Degree of Polymerization 03  
iii.) Polymer Composite 07  
(b) Explain the Hand lay-up technique in detail for preparing Polymer composite with neat sketch 07

OR

- (b) Write in detail about pultrusion method for preparing polymer composite with neat sketch 07

- Q.3 (a) Explain in detail the stress-strain relations and engineering constants. 07  
(b) Enlist the assumption taken in laminate theory and state the stress strain law for single ply in the material axes for unidirectional laminate. 07

OR

- Q.3 (a) Write down the preparation of Novolac phenolic resins along with its properties. 07  
(b) Describe with neat sketch, the different wave pattern of fibers used in composite. 07

- Q.4 (a) Explain filament winding process with suitable diagram. 07  
(b) Explain the working of extruder for preparing polymer composite with sketch. 07  
Write its advantages.

OR

- Q.4 (a) Prepare diagram for Spray-up technique for preparing polymer composite. Also mention its limitations. 07  
(b) Explain the synthesis of Nylon 6,6 in detail along-with its properties. 07

- Q.5 (a) Explain the production of Polypropylene polymer with flow diagram 07  
(b) Explain the cationic polymerization mechanism with suitable example. 07

OR

- Q.5 (a) Explain the method for impact strength testing of polymer composite. 07  
(b) Explain nano-composite in detail along with its advantages and limitations. 07

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