

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VIII EXAMINATION – SUMMER 2016****Subject Code:182103****Date:16/05/2016****Subject Name:Composite Materials (Department Elective - II)****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 discuss the importance of composites over other conventional materials. **07**
- (b) Compare Properties & Application of Carbon-fiber, Glass Fiber and Aramid fiber reinforced composites **07**
- Q.2** (a) What is critical length fiber?? Distinguish between optimal fiber, short fiber & long fiber **07**
- (b) Discuss detailed classification of composites on the basis of reinforcement and matrix **07**
- OR**
- (b) Draw labeled sketch and give suitable examples, Dispersion strengthening and Particulate strengthened composites **07**
- Q.3** (a) Compare properties of Ceramic matrix and Metal matrix composites. **07**
- (b) Describe with neat sketch the following reinforcements **07**
- (i) Particulates (ii) Flakes (iii) Whiskers (iv) Prepegs
- OR**
- Q.3** (a) Explain the role of matrix materials & reinforcements. Also distinguish their mechanical/chemical/physical properties, in brief. **07**
- (b) Explain with suitable examples different strengthening mechanisms in composites. **07**
- Q.4** (a) Explain in brief, various types of interfaces develop in composites and also state the significance of “wettability” in the design of interfaces. **07**
- (b) Explain reasons why glass fibers are most commonly used for reinforcement? Why is the surface perfection of glass fibers so important? **07**
- OR**
- Q.4** (a) Explain with Neat schematic the “filament winding process” & the components/parts being manufactured using this method **07**
- (b) Explain the characteristics of fibers & resin materials in PMC’s. **07**
- Q.5** (a) Explain with schematic Pultrusion Process of fabricating Polymer matrix composite & mention common products manufactured by this method. **07**
- (b) Briefly describe Sandwich Panels and explain prime reason for fabricating these structural Composites. **07**
- OR**
- Q.5** (a) What is a “Hybrid” composite? List two important advantages of hybrid composites over normal fiber composites **07**
- (b) Draw a lay out of synthesis of “Nano-composites” and explain unique properties exhibited by Nano- composites. **07**