

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII(NEW) EXAMINATION – SUMMER 2019

Subject Code: 2182103/2182116
Date: 17/05/2019
Subject Name: Composite Materials
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.

		MARKS
Q.1	(a) What are the advantages and limitations of composites over the other class of materials?	03
	(b) Draw labeled sketch and give suitable examples particulate strengthened composites	04
	(c) Enumerate the applications of composites in the field of:	07
	1) Electrical and electronics, 2) Recreational and Sports equipments and 3) Aerospace industries.	
Q.2	(a) Explain structural composites in detail.	03
	(b) Derive an expression of rule of mixture to calculate stresses on composites.	04
	(c) Classify the composite materials based on the geometry of the reinforcement and explain briefly any two of them.	07
OR		
	(c) Explain the influence of size, shape and distribution of particles on mechanical properties of metal matrix composites.	07
Q.3	(a) Justify the statement, “Glass fiber reinforced polymer matrix composites are well suited to manufacture boats”.	03
	(b) Explain the role of interfaces in composites.	04
	(c) Describe briefly the desirable characteristics of fibers in fiber reinforced composites.	07
OR		
Q.3	(a) Explain wettability with suitable figures.	03
	(b) Differentiate between discontinuous and continuous fiber composites.	04
	(c) What is critical fiber length? Distinguish between Optimal, Short & Continuous size fibers.	07
Q.4	(a) What are advantages of ceramic matrix composites over other two classes of composites?	03
	(b) What are different methods used for metal matrix composites? List them.	04
	(c) Explain with a neat sketch, filament winding process and mention the method and its applications.	07

- Q.4** (a) List the advantages of hybrid composites over normal fiber composites. **03**
- (b) Describe with neat sketch the following reinforcements, **04**
- 1) Whiskers and
- 2) Flakes
- (c) Explain the process of squeeze casting of metal matrix composites. **07**
- Q.5** (a) Explain green composites in detail. **03**
- (b) Draw a lay out for synthesis of Nano-composites. Describe unique properties exhibited by Nano- composites **04**
- (c) Explain the In-situ chemical reaction techniques used to fabricate ceramic matrix composites. **07**

OR

- Q.5** (a) Discuss the application of fiber reinforced composites in automobiles. **03**
- (b) Briefly explain functionally graded composites. **04**
- (c) Write a note on surface metal matrix composites and their applications. **07**

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