Seat No.: _____ Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) EXAMINATION – WINTER 2017

Subject Code: 2182103 **Date: 07/11/2017**

Subject Name: Composite Materials

Time:02:30 PM TO 05:00 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)	Justify the Role of composite materials for the advanced applications.	03
	(b)	Explain with schematic, Tensile Stress–Strain Behavior of a continuous & aligned fiber composites.	04
	(c)	Give detailed classification of composites on the basis of construction	07
Q.2	(a)	Enlist the Suitable materials for Matrix &reinforements for PMC, MMc& CMC's.	03
	(b)	Explain the functions of Matrix & Reinforcements in composite material.	04
	(c)	How are glass fibers produced by using conventional method? What are the drawbacks of this method?	07
		OR	
	(c)	Compare Properties of Metal Matrix composite & Ceramic Matrix composites.	07
Q.3	(a)	What is Green Composite?	03
	(b)	Explain Structural Composites in detail & Justify the applications of Sandwich Panels in Aircraft constructions.	04
	(c)	Critically compare Properties of Carbon-fiber, Glass Fiber and Aramid fiber reinforced composites also give suitable example of each category of Fiber reinforced composites.	07
		OR	
Q.3	(a)	What is critical fiberlength ?	03
	(b)	Explain the influence of L/D ratio on the effective strengthening & stiffening of the composite materials? Distinguish between Optimal, Short & Continuous size fiber	04
	(c)	List various strengthening Mechanisms in composite and Discuss Strengthening mechanics employed in TDS-Ni & WC/ Co Composites	07

Q.4	(a)	Explain wettability with suitable figures	03
	(b)	What is interface? Explain the role of interfaces in composites and also mention some suitable treatment to enhance the interfacial bond strength in composites	04
	(c)	A composite made from 72 % volume of Glass fiber& epoxy resin.Modulus of elasticity, Tensile strength of epoxy & glass fiber are respectively, 41 ×102 MPa, 72 MPa , 76.5 ×103MPa & 2510 MPa. Evaluate, a) E & T.S. of composite material in direction of alignment of fiber. b) Load shared by Two Phases, Load is in direction of alignment of fiber.	07

OR

Q.4	(a)	Draw a lay out for synthesis of Nano-composites. Describe unique properties exhibited by Nano-composites	03
	(b)	Write Short note on : C-C composites	04
	(c)	Draw a Schematic of Resin Transfer Moulding (RTM) & list the components produced by this method.	07
Q.5	(a)	Discuss in brief with schematic the toughening mechanisms in CMC composites.	03
	(b)	Write Short note on Hybrid composites	04
	(c)	With Neat Schematic explain Sol-Gel Synthesis method of Glass fiber production method.	07

OR

Q.5	(a)	Write short note on: Pultrusion Process.	03
	(b)	Draw a neat schematic of Vacuum bag moulding& list the components produced using this process.	04
	(c)	Explain with schematic process of Filament Winding also give examples of the components produced using this technique.	07

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