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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