B.E/B.Tech (Full-Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY2011

MATERIALS SCIENCE AND ENGINEERING BRANCH

SIXTH SEMSTER-REGULATION 2008

ML9353 COMPOSITE MATERIALS

Time: 3Hr **Max.Mark:100**

Answer ALL Questions

Part –A (10x2=20 Marks) 26

1. What are the functions of matrix materials
2. Distinguish between dispersion strengthened and particle reinforced composite.
3. What does $(0/+45/-45)_S$ stand for?
4. Name at least four thermoplastic polymers used as a matrix material.
5. What are the ways to control the interface reaction between Al and SiC?
6. What are the effects of preheating of ceramic reinforcements?
7. What are the matrix materials for CMC?
8. What are the applications of CMC?
9. Distinguish between high strength and high modulus fibers.
10. List out the applications of C/C composites.

Part – B (5x16 = 80 Marks)

11	(i)	List out the matrix and reinforcement materials for PMC, MMC and CMC	(8)
	(ii)	Discuss the important properties of the matrix and reinforcement materials for PMC, MMC and CMC	(8)
12a		Discuss the following process in detail (a)Filament winding (b) Resin transfer molding (c) Resin reaction injection molding	(16)
		OR	
12b		What is interface? What are the factors controlling the bonding at the interface?	(16)
13a	(i)	Explain the benefits and drawbacks associated with liquid sate processing of MMC	(6)
	(ii)	How the interface reaction is controlled during the processing of Al/SIC composite?	(10)
		OR	
13b		Explain the following processing methods (i) liquid melt impregnation (ii) diffusion bonding	(16)
14a	(i)	Explain the toughening mechanism of CMC	(6)
	(ii)	Explain any two methods to process CMC	(10)
		OR	
14b		Derive an expression for E_{11} and E_{22}	(16)
15a	(i)	Explain the significance and applications of C/C composites	(8)
	(ii)	Explain any one technique to process C/C composite	(8)
		OR	
15b		Explain the processing methods of PAN and PITCH based carbon fibers	(16)