U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester:VI**

Branch: Institutional Elective **Duration: 3 hrs.**

Course Code: 23CH6OECOM / 22CH6OECMS **Max Marks: 100**

Course: Composite Materials

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		What are ceramics? Describe the general properties of ceramics.	*CO1*	*PO 1*	**05**
	b)		Why are ceramics brittle in nature while metals are ductile?	*CO1*	*PO1*	**05**
	c)		Define traditional ceramics. Discuss various types of traditional ceramics in detail.	*CO2*	*PO2*	**10**
			OR			
2	a)		What is reaction bonding? Explain the steps involved in the Reaction Bonded Silicon Carbide (RBSC) method.	*CO2*	*PO2*	**06**
	b)		Draw a flow-chart for sol-gel process.	*CO2*	*PO2*	**06**
	c)		What is a preceramic polymer? Explain steps involved in the production of silicon carbide ceramic using polymer pyrolysis route.	*CO2*	*PO2*	**08**
			UNIT - II			
3	a)		Define sintering and discuss the various driving forces involved in sintering in detail.	*CO3*	*PO3*	**10**
	b)		Draw a labelled diagram of the tape casting method used for producing ceramic films.	*CO3*	*PO3*	**05**
	c)		Differentiate between wet-beg pressing and dry-beg pressing.	*CO3*	*PO3*	**05**
			OR			
4	a)		List the various types of CVD reactor used for thin film disposition. Discuss any two in detail.	*CO3*	*PO3*	**10**
	b)		Define glass fiber and describe the steps involved in the production of glass fibers along with a diagram.	*CO3*	*PO3*	**10**

			UNIT - III			
	5	a)	What are the key characteristic of synthesized advanced ceramic powder?	*CO1*	*PO1*	**05**
		b)	Define comminution. List the equipment's used for comminution and discuss any two in detail.	*CO2*	*PO2*	**10**
		c)	Draw a neat, and labelled diagram of the spray drying process.	*CO2*	*PO2*	**05**
			OR			
	6	a)	Define polymer-clay nanocomposite. Discuss various methods for their preparation.	*CO4*	*PO7*	**10**
		b)	Explain the mechanism of self-healing composites with a suitable diagram.	*CO4*	*PO7*	**10**
			UNIT - IV			
	7	a)	Differentiate between extensive and intensive mixing.	*CO4*	*PO7*	**05**
		b)	List the equipment used for blending. Discuss any two in detail.	*CO4*	*PO7*	**10**
		c)	Define metal matrix composites (MMCs) and discuss their applications.	*CO5*	*PO12*	**05**
			OR			
	8	a)	Explain the stir casting methods for preparing metal matrix composites (MMCs). Discuss its advantage and disadvantages.	*CO4*	*PO7*	**10**
		b)	Draw a labelled diagram of spray forming for the production of MMCs and explain.	*CO5*	*PO12*	**10**
			UNIT - V			
	9	a)	Explain the role of fiber orientation in fiber-reinforced polymer composites.	*CO5*	*PO12*	**05**
		b)	Write short note on the following manufacturing methods: (i) Hand lay-up (ii) pultrusion	*CO5*	*PO12*	**10**
		c)	List any five applications of polymer composites in the automobile industry.	*CO5*	*PO12*	**05**
			OR			
	10	a)	Define polymer composites. Name any two fibers used in fiber-reinforced polymer composites.	*CO5*	*PO12*	**05**
		b)	Write short note on the following manufacturing methods: (i) Filament winding (ii) sheet molding compound (SMC)	*CO5*	*PO12*	**10**
		c)	List any five major applications of polymer-reinforced composites.	*CO5*	*PO12*	**05**

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