U.S.N.										

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

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Mechanical Engineering **Duration: 3 hrs.**
Course Code: 20ME5DECMT **Max Marks: 100**
Course: Composite Material Technology **Date: 14.09.2023**

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

UNIT - I

1.	a)	Discuss in detail Fibrous, Particulate and Laminated composites.		**09**
	b)	Elaborate classification of composite materials.		**06**
	c)	Compare vacuum bag molding and pressure bag molding techniques.		**05**

OR

2.	a)	Illustrate Filament winding process.		**10**
	b)	Discuss the future potential of composite materials.		**05**
	c)	Justify the application of composite materials in Automobile industry.		**05**

UNIT - II

3.	a)	List the assumptions made in micro mechanical analyses of a lamina.		**04**
	b)	Obtain an expression for major Poission's ratio (ν_{12}) by rule of mixtures.		**07**
	c)	Compare Isotropic, Anisotropic and Orthotropic materials.		**09**

UNIT - III

4.	a)	Show the relationship of compliance and stiffness matrix to engineering constants of a two dimensional lamina.		**10**
	b)	Develop stress strain relationship for a two dimensional angle lamina for the x–y coordinate system.		**10**

OR

5.	a)	Compare maximum stress failure theory, maximum strain failure theory and Tsai –Hill failure theory.	**12**
	b)	Explain Tsai–Wu Failure Theory in detail.	**08**

UNIT - IV

6.	a)	Derive ABD matrix for a composite laminate using classical lamination theory.	**16**
	b)	Explain the following laminate codes [0/–45/90_2 /60/0], [0/–45/60]s	**04**

UNIT - V

7.	a)	"Squeeze casting gives better mechanical properties than stir casting". Justify.	**05**
	b)	With a neat sketch explain Diffusion bonding.	**10**
	c)	Select a suitable powder production technique for a brittle material and explain.	**05**

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