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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M.Tech. (First Semester) Regular Examinations, February – 2025

24MMTPC11001 – Composite Material

(Manufacturing Technology)

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Differentiate between particles, fibers, and whiskers as reinforcing materials in FRP.	CO1	K2
b. List down the reinforcement materials and resins used in composite materials	CO2	K2
c. Describe the relevance of the plane stress condition in the behavior of laminae.	CO3	K3
d. Write the four elastic moduli of a unidirectional lamina.	CO4	K1
e. State the process filament winding.	CO5	K2

PART – B **(10 x 5=50 Marks)**

Answer ***ALL*** the questions		Marks	CO #	Blooms Level
2. a.	Write a brief note on engineering applications of composites.	5	CO1	K2
b.	List out the reasons, why polymers are preferred in making laminated composites.	5	CO1	K2
	(OR)			
c.	Write a brief note on natural and manmade composites.	5	CO1	K2
d.	Find the stiffness matrices [A], [B] for a three ply [0/30/-45] graphite epoxy laminate. Assume each lamina has a thickness of 5mm. The properties of graphite/epoxy El =181 GPa, Et =10.3 GPa, _lt = 0.28 and Glt =7.17 GPa	5	CO2	K3
3.a.	Write on diluents. Explain reactive diluents for epoxy resin.	5	CO2	K2
b.	Discuss the failure mechanisms in fibre reinforced polymer matrix composites and describe a failure theory which is widely used for testing of polymer composites	5	CO3	K2
	(OR)			
c.	Explain about Aramid fibers along with its applications.	5	CO2	K2
d.	Discuss in detail the following failure theories and specify the advantages of each over the other. (i) Maximum Stress Failure theory (ii) Maximum Strain Failure Theory	5	CO3	K2
4.a.	Explain Hooke's law for a two dimensional unidirectional lamina.	5	CO3	K3
b.	Define lamination theory. Describe with a sketch of laminate stacking sequence.	5	CO3	K2
	(OR)			
c.	Derive the governing differential equations for a symmetric cross ply laminated plate.	5	CO4	K3
d.	Show the reduction of anisotropic material stress-strain equations to those of monoclinic material stress-strain equations.	5	CO4	K2
5.a.	Explain filament winding process with neat diagram and applications.	5	CO5	K2
b.	Differentiate between the total – ply failure method and partial – ply failure method.	5	CO4	K2

(OR)

c.	Write the difference between RTM and compression molding	5	CO6	K2
d.	Explain hand-layup technique with neat diagram, along with its advantages and disadvantages.	5	CO5	K2
6.a.	Draw and explain manufacturing process of glass fiber.	5	CO6	K2
b.	Write short notes on vacuum bag moulding and continuous pultrusion	5	CO5	K2

(OR)

c.	Give advantages and limitations of FRP.	5	CO1	K2
d.	Explain press bag and autoclave.	5	CO6	K2

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