

**Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)**

M.Tech. (Second Semester - Regular) Examinations, May – 2026

24MSEPE12001 – Composite Structures



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. List the advantages of composite materials.	CO1	K2
b. Define isotropic material.	CO2	K2
c. State Hooke's law for orthotropic materials.	CO3	K2
d. Define multidirectional laminate.	CO4	K2
e. Explain thin laminated plate theory	CO5	K2

PART – B

(10 x 5 = 50 Marks)

Answer **ALL** the questions

	Marks	CO #	Blooms Level
2. a. Compare the mechanical behaviour of isotropic and orthotropic materials for structural applications.	10	CO1	K3
(OR)			
b. Illustrate the role of fibre orientation in improving the strength and stiffness of composite materials.	10	CO1	K3
3.a. Compute the transformed reduced stiffness matrix for a given fibre orientation angle.	10	CO2	K3
(OR)			
b. Derive the stress-strain relationship for a specially orthotropic lamina under plane stress condition.	10	CO2	K3
4.a. Compute the A, B and D matrices for a given laminated composite configuration.	10	CO3	K3
(OR)			
b. Analyze the effect of stacking sequence on the stiffness and strength of laminated composites.	10	CO3	K3
5.a. Apply thin laminated plate theory to evaluate deflection and bending stresses in rectangular cross-ply laminates under uniformly distributed loading.	10	CO4	K3
(OR)			
b. Analyze the influence of boundary conditions on the bending response of laminated composite plates.	10	CO4	K3
6.a. Determine the maximum deflection of a simply supported symmetric cross-ply laminate under uniformly distributed load.	10	CO5	K3
(OR)			
b. A multidirectional laminate is subjected to known in-plane loads. Explain how to determine whether any ply fails using the Tsai-Wu failure criterion. Include the steps and required material properties.	10	CO5	K3

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