Reg. No. : | | | | | | | | | | | | |

Question Paper Code:U2911

M.E.DEGREE EXAMINATION, NOV 2025

Professional Elective

CAD / CAM

21PCD511–COMPOSITE MATERIAL AND MECHANICS

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1.	(a)	Compare and contrast different types of composite materials based on their constituent materials and properties.	C01-U	(20)
		Or		
	(b)	Analyze the mechanical properties and performance advantages of metal matrix composites in specific applications	CO1-U	(20)
2.	(a)	Critique the performance of solid structures under various load conditions, considering their ability to withstand deformation, stress concentration, and failure.	CO2-Eva	(20)
		Or		
	(b)	Analyze the impact of temperature on the mechanical properties of materials, such as strength, stiffness, and ductility.	CO2-Eva	(20)
3.	(a)	Assess the impact of environmental factors, such as moisture absorption and temperature variations, on the mechanical behaviour of composite materials.	CO1-Ana	(20)
		Or		
	(b)	Analyze the stress distribution within laminated composite materials, considering the interaction between different layers and their contribution to overall properties, such as strength, stiffness, and fracture resistance	CO1-Ana	(20)

4.	(a)	Evaluate the performance of MMCs based on their resistance to metal matrix cracking and overall mechanical behaviour.	CO4-Ana	(20)
		Or		
	(b)	Critique the advantages of studying the CPRF in composite materials, such as its ability to provide information on the failure mechanisms and damage propagation in the material.	CO4-Ana	(20)
5.	(a)	Analyze the mechanical behaviour of FRPs, considering factors such as Fiber orientation, volume fraction, interfacial bonding, and the influence of the polymer matrix.	CO2-Ana	(20)
		Or		
	(b)	Assess the specific requirements and regulations in the automotive sector, such as safety standards, durability testing, and recycling initiatives, to ensure compliance and sustainability.	CO2-Ana	(20)