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Question Paper Code: U5111

M.E. DEGREE EXAMINATION, APRIL/ MAY 2025

Second Semester

CAD / CAM

21PCD511 –COMPOSITE MATERIALS 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 the surface preparation techniques used for short fiber composites, highlighting their advantages and limitations. CO2- App (20)
Or
(b) Describe the role of fiber reinforcement in composite materials and how it contributes to their mechanical properties. CO2- App (20)
2. (a) Apply the principles of linear elasticity to determine the strains induced in an anisotropic material under a given stress field. CO3- App (20)
Or
(b) Given the stress tensor and material properties of an anisotropic material, determine the resulting strain tensor using linear elasticity theory. CO3- App (20)
3. (a) Describe the governing equations for anisotropic plates and how they differ from those for isotropic plates. CO3- App (20)
Or
(b) Discuss the implications of buckling on the structural integrity and performance of the plate. CO3- App (20)
4. (a) Apply the fracture mechanics principles to analyze the critical crack length in a composite material specimen. CO3- App (20)
Or
(b) Compare and contrast the maximum stress and maximum strain failure criteria, highlighting their respective advantages and limitations. CO3- App (20)

5. (a) Apply the composite material techniques to design a lightweight, CO3- App (20)
high-strength bicycle frame suitable for competitive racing.

Or

- (b) Compare Mechanical properties, manufacturing processes and CO3- App (20)
typical applications in engineering.