



# CBCS SCHEME

21AE642

## Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Composite Materials and Structures

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Name and describe some of common materials used in man made composites. (10 Marks)
- b. Describe the role of composites in structures and aerospace applications. (10 Marks)

OR

- 2 a. Discuss can composites be applied in civil engineering projects such as building construction. (10 Marks)
- b. Discuss potential uses of composites in automotive engineering. (10 Marks)

### Module-2

- 3 a. Describe the following reinforcement used in composites:  
(i) Glass fibers (ii) Carbon fibers (10 Marks)
- b. Explain how particulates contributes to the properties of composite materials. (10 Marks)

OR

- 4 a. Evaluate the potential benefits and challenges of using metal matrix composites in high temperature applications. (10 Marks)
- b. Create a laminate designation for a composite material indicating its fiber type and reinforcement orientation. (10 Marks)

### Module-3

- 5 a. Describe with neat sketch compression and vacuum bag moulding process for preparing polymer matrix composites. (10 Marks)
- b. Sketch and explain fabrication of casting by stir casting method. (10 Marks)

OR

- 6 a. Explain briefly fabrication process of MMCs by powder metallurgy methods. (10 Marks)
- b. Write a note on the following processes:  
(i) Machining (ii) Joining of composites. (10 Marks)

### Module-4

- 7 a. Discuss the strength properties of unidirectional composites. (10 Marks)
- b. Describe particulate and short fiber composite in brief. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8=50, will be treated as malpractice.

OR

- 8 a. Briefly explain different properties of fibers and matrix to determine the characterization of composites as per ASTM standards. (10 Marks)
- b. Discuss Non-Destructive Testing (NDT) methods used for evaluating composite materials. (10 Marks)

**Module-5**

- 9 a. Discuss briefly thin laminated composite plate theory. (10 Marks)
- b. Describe the Galerkin method to solve a specific problem related to laminated plate theory. (10 Marks)

OR

- 10 a. Explain briefly bending of laminated composite plate. (10 Marks)
- b. Discuss how ground and space environment effects can influence the long - term durability of composite structures. (10 Marks)

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