

Code: 17MEMD1T6B

**I M.Tech - I Semester – Regular/Supplementary Examinations  
February 2020**

**MECHANICS OF COMPOSITE MATERIALS  
(MACHINE DESIGN)**

Duration: 3 hours

Max. Marks: 60

Answer the following questions.

1. a) Explain the classification of composite materials with neat sketches. 8 M
  - b) Discuss the applications of various composite materials. 7 M
- (OR)
2. a) Compare the metal matrix composites with other composites. 8 M
  - b) Explain the filament winding process with a neat sketch. 7 M
3. a) Establish stress strain relations for a lamina of arbitrary orientation. 8 M
  - b) Find the transformation relations for elastic constant  $E_x$  in terms of engineering constants ( $E_1$ ,  $E_2$ ,  $G_{12}$ ,  $\nu_{12}$  and  $\nu_{21}$ ) 7 M

(OR)

4. a) Discuss about the longitudinal Tension strength of Uni-directional lamina. 8 M

b) Explain Tsai-Wu failure theory used for composites. 7 M

5. a) Explain the basic assumptions in the analysis of laminated composites. 7 M

b) Explain Force and Moment Resultants of a laminate. 8 M

(OR)

6. What is meant by symmetric and balanced laminate and write the A, B and D matrix for each laminate. 15 M

7. Explain different failure modes of composite laminates with neat sketches. 15 M

(OR)

8. Write short notes on  
i. Matrix cracking.  
ii. Delamination  
iii. Fiber Failure. 15 M