

**Question Paper Code: 59712**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Elective

Mechanical Engineering

15UME 912 - COMPOSITE MATERIALS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

PART A - (10 x 2 = 20 Marks)

Answer Any ten of the following Questions

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|---|-------|-----|
| 1. Define composite material  | (CO1) | (R) |
| 2. Distinguish lamina and laminate  | (CO1) | (R) |
| 3. Write about advantages of composite materials                                | (CO1) | (R) |
| 4. List down the reinforcement materials and resins used in composite materials | (CO2) | (R) |
| 5. Write about advantages of kelvar fibres.                                     | (CO2) | (U) |
| 6. Write about applications of Thermoset matrix.                                | (CO2) |     |
| 7. Discuss about properties of Al metal matrix composites.                      | (CO3) | (U) |
| 8. Write about advantages of metal matrix composites.                           | (CO3) | (R) |
| 9. List the various processing methods of MMCs                                  | (CO3) | (U) |
| 10 Discuss about applications of ceramic matrix composites.                     | (CO4) | (R) |
| 11 List the various CMC manufacturing processes                                 | (CO4) | (U) |
| 12 Write about limitations of ceramic matrix composites                         | (CO4) | (R) |
| 13 List the various Non-destructive testing methods for composite materials     | (CO5) | (U) |
| 14 Write about advantages of Ultrasonic Testing                                 | (CO5) | (R) |
| 15 Write about disadvantages/limitations of Radiographic Testing                | (CO5) | (R) |

PART – B (5 x 16= 80 Marks)

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|---|-------|-----|
| 16. (a) Discuss about advantages and limitations of composite materials | (CO1) | (U) |
|---|-------|-----|

Or

- (b) Discuss about properties of composite materials over conventional materials. (CO1) (U)
17. (a) Explain about the PMC manufacturing process of 'Hand layup method' with neat sketch (CO2) (U)
- Or
- (b) Demonstrate the PMC manufacturing process of 'Filament winding method' With neat sketch (CO2) (U)
18. (a) Describe about the process of "stir casting" and write about its uniqueness in MMC manufacturing process. (CO3) (U)
- Or
- (b) Demonstrate the MMC manufacturing process of 'infiltration' with neat sketch (CO3) (A)
19. (a) Describe about the process of "chemical vapor deposition" and write about its uniqueness in CMC manufacturing process. (CO4) (U)
- Or
- (b) Demonstrate the CMC manufacturing process of 'sintering' with neat sketch. (CO4) (U)
20. (a) Demonstrate the Non-Destructive Testing method of 'Acoustic Emission (AE)' with neat sketch. (CO5) (U)
- Or
- (b) Demonstrate the Non-Destructive Testing method of 'Radiographic testing' with neat sketch (CO5) (U)



