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## GIET UNIVERSITY, GUNUPUR – 765022

Ph.D. (Second Semester) Examinations, April - 2024

### PPEME2028 - Manufacturing of Composites (Mechanical)

Time: 3 hrs

Maximum: 70 Marks

The figures in the right-hand margin indicate marks.

#### Answer ANY FIVE Questions

(14 x 5 = 70 Marks)

|   | Marks |
|---|-------|
| 1. How do environmental factors, such as moisture, chemicals, and UV radiation, influence the properties and performance of composite materials and selection for composite applications? | 14    |
| 2.a. Explain different types of composites in constructions and their uses  | 7     |
| b. List the types of Composite testing methods .Explain any one testing method in composite materials with neat sketch.   | 7     |
| 3.a. How many stages are there to curing resins and what are they? Explain each   | 7     |
| b. With neat sketches, explain the workings of auto clave moulding process.   | 7     |
| 4.a. Can you explain the steps involved in hand lay-up manufacturing process for thermoset composites?  | 7     |
| b. What are the primary thermoset composite manufacturing processes, and how do they influence design decisions?  | 7     |
| 5.a. What do you mean by NDT? List out various types of NDT for composite materials.  | 7     |
| b. Can you explain the advantages of thermoplastic composite materials over thermoset composites in terms of manufacturing and performance?   | 7     |
| 6. How do processing parameters such as temperature, pressure, and cooling rate influence the microstructure and properties of metal matrix composites?                                   | 14    |
| 7.a. Explain polymer matrix and Nano composites.  | 7     |
| b. What are the primary advantages of using carbon-carbon composites over traditional materials in high-temperature applications?   | 7     |
| 8. How do advancements in nanofiber technology contribute to the enhancement of mechanical properties and functionalities of composite materials?   | 14    |

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