

Code No: **R164103D**

R16

Set No. 1

IV B.Tech I Semester Regular/Supplementary Examinations, Jan/Feb - 2022

ADVANCED MATERIALS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any FOUR questions from Part-B

PART-A (14 Marks)

1. a) Mention the applications in which boron carbide fibre is used. [2]
- b) What are the properties of thermoplastics? [2]
- c) Give the applications of Resin transfer molding process. [3]
- d) What is meant by laminate-laminate code? [3]
- e) List out the applications of functionally graded materials. [2]
- f) Mention the applications of Nano tubes. [2]

PART-B (4x14 = 56 Marks)

2. a) Briefly explain carbon-carbon composites with their applications. [7]
- b) Discuss the characteristics of glass-fibre reinforcement. [7]
3. a) What are the challenges in polymer composites? Discuss briefly. [7]
- b) Discuss the applications of metal matrix composite. [7]
4. a) List out the manufacturing methods of carbon-carbon composite and explain any one of them with a neat sketch. [7]
- b) Discuss any one open mold FRP Process with a neat sketch. [7]
5. a) Explain Hook's law for orthotropic materials with necessary relations. [7]
- b) Give Relationship of Compliance and Stiffness Matrix to engineering elastic constants of an orthotropic lamina. [7]
6. a) Discuss the properties of functionally graded materials. [7]
- b) Classify shape memory alloys and mention their corresponding applications. [7]
7. a) Enumerate the properties of nano materials. [7]
- b) Give a brief note on Nano wires. [7]

