

**IV B.Tech I Semester Supplementary Examinations, July/Aug - 2021****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*

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**PART-A (14 Marks)**

1. a) What are the applications of Kevlar reinforced composite? [2]
- b) Write the properties of thermosetting plastics? [2]
- c) Give the applications of closed mold FRP Process. [2]
- d) Give the expression for Reduced Hooke's law from three dimensions to two dimensions. [4]
- e) Classify functionally graded materials. [2]
- f) Give the applications of Nano composites. [2]

**PART-B (4x14 = 56 Marks)**

2. a) Briefly explain nature-made composites with their applications. [7]
- b) Mention various phases in fibrous composites. Explain their functions. [7]
3. a) Discuss the recent advances in Polymer Composites. [7]
- b) Explain the applications of carbon-carbon composite. [7]
4. a) List out the manufacturing methods of polymer matrix composite and explain any one of them with a neat sketch. [7]
- b) Discuss any one closed mold FRP Process with a neat sketch. [7]
5. a) Obtain stiffness matrix from compliance matrix for orthotropic materials. [7]
- b) Explain the principle of Hooke's Law and give a note on Hook's law for anisotropic (triclinic) materials. [7]
6. a) Name some shape memory alloys. Give the mechanical properties and applications of the above materials. [7]
- b) Discuss the applications of functionally graded materials. [7]
7. a) Explain the electrical properties of Nano materials. [7]
- b) Give a brief note on Nano wires and tubes. [7]