# AR19

**CODE: 19MOE1003** **SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**
**(AUTONOMOUS)**
**I M.Tech II Semester Regular & Supplementary Examinations, January,2022**

**COMPOSITE MATERIALS**
**(Common for all Branches)**

Time: 3 Hours Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

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|---|---|---|---|
| 1. | a) | Give the classification of Composites based on the (i) source, (ii) geometry of reinforcement, (iii) matrix materials. | 6M |
| | b) | Why Composite is important and Explain with its application? | 6M |
| 2. | a) | Why Glass Fiber-Reinforced Polymer (GFRP) Composites are popular | 6M |
| | b) | Draw the force displacement curve of pulling a fibre out of the matrix and explain how the fibre pull-out and debonding improve the toughness. | 6M |
| 3. | a) | What is wettability? How is the degree of wetting determined? | 4M |
| | b) | Explain the squeeze casting method with suitable diagrams. | 8M |
| 4. | a) | Give a comparison of the physical and mechanical properties of MMCs with that of monolithic metals the variation of these properties with types of reinforcement, proportion of reinforcement and orientation of fibres (angle between tensile axis and fibre axis) in MMCs. | 6M |
| | b) | Difference between cermets and SAP (Slandered applications and products) type materials. | 6M |
| 5. | a) | With a suitable diagram explain the chemical vapour infiltration (CVI) process | 6M |
| | b) | Explain the toughening mechanisms in Zirconia Toughened Alumina CMCs | 6M |
| 6. | a) | Explain different fabrication process and mechanical properties of dense carbon-carbon composite | 6M |
| | b) | Explain various processing of fiber-reinforced composites. Explain with a neat sketch pultrusion process of composite? | 6M |
| 7. | a) | How the environmental effects by using polymer matrix composites and how to recycle the PMCs. | 6M |
| | b) | What are the factors/consequence of Lamina failure | 6M |
| 8. | a) | A glass/ epoxy specimen weight 0.98 gm was burnt and the weight of the remaining fibre was found to be 0.49gm. densities of glass and epoxy are 2.4 gm//ml and 1.20 gm/ml respectively. Determine the density of composites in the absence of voids. If the actual density of the composite was measured to be 1.50 gm/ml, what is the void fraction? | 6M |
| | b) | Write a short note on Theories of stress transfer in short fibers? | 6M |