



B.E/B.Tech (Full-Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY2014
MATERIALS SCIENCE AND ENGINEERING BRANCH
SIXTH SEMSTER-REGULATION 2008

ML9353- COMPOSITE MATERIALS

Time: 3Hr

Max.Mark:100

Answer ALL Questions

Part –A (10x2=20 Marks)

1. What are the functions of matrix materials?
2. Weak interface bonding is desired in CMC-True or false Justify your answer
3. Compare the properties of carbon and Kevlar fibers.
4. What are prepregs?
5. Addition of Si into Al melt will reduce Al_4C_3 formation; is it true or false-Justify your answer
6. What are the pre requirements to prepare a fiber preforms?
7. What are the properties of engineering ceramics?
8. List out the applications of MMC and CMC.
9. Why surface treatments of fibers are necessary?
10. State the conditions in which fiber pull out and fiber push out test will be performed.

Part – B (5x16 = 80 Marks)

- 11 (i) Discuss the requirements of matrix and reinforcement materials for PMC, MMC and CMC. (10)
(ii) Discuss the properties of different types of glass fibers (6)
 - 12a (i) With neat diagram explain the following processing technique for PMC (12)
(a) vacuum bag technique (b) Pultrusion (c) filament winding
(ii) Explain the effects of Silane treatments on glass fibers. (4)
- OR**
- 12b (i) Explain the mechanism of bonding at the interface. Discuss the important factors that affect the bonding at the interface? (10)
(ii) Discuss the failure mechanisms of fiber reinforced composites (6)
 - 13a (i) Explain the role of temperature on the distribution of reinforcement and Interphase reaction (10)
(ii) Explain with any one reaction, the formation of in-situ composites (6)
- OR**
- 13b (i) Derive an expression for density of composite (4)
(ii) Explain the methods to predict the interface bonding strength (12)

- 14a (i) Explain the toughening mechanism of CMC (6)
(ii) Explain the following process (i) HIP (2) slurry impregnation technique (10)
OR
- 14b (i) Explain any one suitable method to prepare oxide based CMC (8)
(ii) Explain the method to prepare SiC/C/SiC composite (8)
- 15a (i) Explain the production of carbon fibers from PAN and PITCH (8)
(ii) Explain the surface treatments performed on carbon fibers (8)
OR
- 15b (i) Explain the following process to fabricate C/C composites (16)
(i) CVD (ii) impregnation