USN | | | | | | | | | | 06ME662

Sixth Semester B.E. Degree Examination, June/July 2011
Mechanics of Composite Materials

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. List the desired properties of matrix and the reinforcement in a composite material.(05 Marks)
   b. What are the advantages and limitations of composites over the other class of materials?
                                                                                    (10 Marks)
   c. Define aspect ratio. Explain its significance.   (05 Marks)

2 a. Explain with sketch the Vacuum bag moulding technique of fabricating PMCs.   (10 Marks)
   b. Explain with sketch the Blow moulding technique of fabricating PMCs.   (10 Marks)

3 a. Discuss the applications of fiber reinforced composites in automobiles.   (10 Marks)
   b. Explain the salient features of PMCs leading to successful applications in aerospace
      engineering.   (10 Marks)

4 a. Differentiate between lamina and laminate.   (02 Marks)
   b. Write stress-strain relationship in matrix form for a lamina and explain the terms involved.
                                                                                    (10 Marks)
   c. Explain the relationship between engineering constants reduced stiffness and compliances.
                                                                                    (08 Marks)

PART – B

5 a. Explain the basic assumptions in the analysis if laminated composites.   (10 Marks)
   b. Explain interlaminar stresses and edge effects in laminated composites.   (10 Marks)

6 a. List the various types of reinforcements used in metal matrix composites.   (05 Marks)
   b. Explain the processes in the production of carbon fibers.   (10 Marks)
   c. Explain briefly the need for developing the metal matrix composites.   (05 Marks)

7 a. Explain the powder metallurgy technique of producing metal matrix composites.   (12 Marks)
   b. Explain the In-situ fabrication process of metal matrix composites.   (08 Marks)

8 a. Compare the performance of metal matrix composites against bare metals with respect to the
      following properties:
      i) Tensile strength   ii) Fatigue strength.   (10 Marks)
   b. Explain the effect of size, shape and distribution of particulates in metal matrix composites.
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