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10AU663

**Sixth Semester B.E. Degree Examination, June/July 2017**  
**Composite Materials**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Define composite material. Give the detailed classification with suitable block diagram and list the characteristics of composite materials. (10 Marks)  
b. Distinguish between thermoplastic and thermoset composites. (04 Marks)  
c. List the different matrix and reinforcements used in MMC's, PMC's and CMC's. (06 Marks)
- 2 a. Sketch and explain the Hand lay-up technique/process to fabricate polymer matrix composites. (10 Marks)  
b. Explain with neat sketch the vacuum bag moulding process of preparing polymer matrix composites. (10 Marks)
- 3 a. Sketch and explain the filament winding process to fabricate the fiber reinforced polymer composites. (10 Marks)  
b. With a neat sketch and explain the pultrusion process to fabricate FRP composites. (10 Marks)
- 4 a. Sketch and explain the Laser beam cutting of composites and mention its advantages and disadvantages. (10 Marks)  
b. Briefly describe the different joining methods of composites. (10 Marks)

**PART – B**

- 5 Write explanatory notes on the applications of composites materials in the following fields :  
a. Automobile industries  
b. Air craft/missile/space industries  
c. Electrical and Electronics industries  
d. Marine and sporting goods industries. (20 Marks)
- 6 a. Sketch and explain the powder metallurgy process/technique for fabrication of metal matrix composites. (10 Marks)  
b. With a neat sketch and explain the squeeze casting technique for fabrication of metal matrix composites. (10 Marks)
- 7 a. What are different matrix and reinforcement materials used in MMC production? (05 Marks)  
b. What are the properties/characteristics of MMCs? (05 Marks)  
c. Explain briefly the need for developing the metal matrix composites. (05 Marks)  
d. List the advantages, disadvantages and application of MMCs. (05 Marks)
- 8 a. Explain the influence of shape, size and distribution of reinforcement on the properties of MMC's (metal matrix composites) (10 Marks)  
b. What are shape memory alloys? What are their applications? Describe mechanisms of their behaviour. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.