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10AU663

Sixth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Composite Materials

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1
 - a. Define Composite Materials and classify them. (06 Marks)
 - b. List out the different types of Reinforcement and mention the properties of reinforcement. (08 Marks)
 - c. Write a short note on laminated composites. (06 Marks)
- 2
 - a. With a neat sketch, explain Hand Layup technique for composite materials. (07 Marks)
 - b. Explain Filament winding process, with a neat sketch. (07 Marks)
 - c. What is Curing? Differentiate open and closed mold processing of composites. (06 Marks)
- 3
 - a. Describe briefly with a neat sketch, pultrusion process for production of composite materials. Also mention advantages, disadvantages and applications. (10 Marks)
 - b. Write a short note on :
 i) Injection molding ii) Pulforming process. (10 Marks)
- 4
 - a. What are the basic requirements of tools in fabrication of composites? (05 Marks)
 - b. What are the limitations / drawbacks of the composite tooling materials? (05 Marks)
 - c. Explain why use adhesives? What are major classes of adhesive and also mention advantages and disadvantages of adhesive bonding of composites? (10 Marks)

PART – B

- 5
 - a. List out the applications in : i) Automobile Industry ii) Electrical and Electronic
 iii) Recreational and sports iv) Aircraft. (10 Marks)
 - b. In detail, explain the selection of matrix in Metal matrix composites (MMC). (10 Marks)
- 6
 - a. List the important requirements of reinforcement materials, in MMC. (05 Marks)
 - b. What is the need for developing MMC? (05 Marks)
 - c. Name the matrix and fiber used in metal matrix composites and its applications. (05 Marks)
 - d. Write about advantages of MMC's. (05 Marks)
- 7
 - a. Describe Powder Metallurgy techniques with a flow chart for fabrication of metal matrix composites. (10 Marks)
 - b. With a neat sketch, explain the production of Aluminum based composites using particulates by liquid Metallurgy techniques. (10 Marks)
- 8
 - a. Describe about Mechanical and wear properties of MMC's. (05 Marks)
 - b. Describe the effects of size, shape and distribution of particulars on properties of MMC's. (10 Marks)
 - c. Write a short note on Shape Memory Alloys. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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10AU663

Sixth Semester B.E. Degree Examination, June/July 2016
Composite Materials

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1
 - a. Define Composite Materials and give the broad classification of it. (08 Marks)
 - b. List and explain different types matrix materials used in polymer matrix composites. (08 Marks)
 - c. What are the advantages and limitations of composites? (04 Marks)
- 2
 - a. List different methods used in production of FRP's. Briefly explain general steps involved in the production of FRP's. (10 Marks)
 - b. With a neat sketch, explain hand layup technique and sprayup technique. (10 Marks)
- 3
 - a. With a neat sketch, explain the following process :
 i) Pultrusion ii) Blow Molding. (10 Marks)
 - b. With a neat sketch, explain pulforming. (10 Marks)
- 4
 - a. Explain the different methods used for composite cutting. (10 Marks)
 - b. List the different types of composites joining process and explain any one process. (10 Marks)

PART – B

- 5
 - a. Briefly explain the applications of composites. (10 Marks)
 - b. Explain with a neat sketch, any one of the solid state processing of composites. (10 Marks)
- 6
 - a. Briefly explain different types of reinforcement materials used in MMC's. (10 Marks)
 - b. With a neat sketch, explain vacuum bag molding process highlighting its advantages. (10 Marks)
- 7
 - a. With a neat sketch, explain the powder metallurgy technique for fabrication of composites. (10 Marks)
 - b. Classify liquid state processing methods and briefly explain squeeze infiltration method. (10 Marks)
- 8 Write short notes on any four of the following :
 - a. Shape Memory Alloys.
 - b. Application of MMC's.
 - c. Filament winding.
 - d. Particle size and apparent density.
 - e. Hot Iso static pressing.

(20 Marks)

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10AU663

Sixth Semester B.E. Degree Examination, Dec.2015/Jan.2016
Composite Materials

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

1. a. Define Composite materials. Explain the classification of composites. (04 Marks)
 b. List the advantages and disadvantages of composite materials. (06 Marks)
 c. Distinguish between Thermoplastic and Thermoset polymers. (10 Marks)
2. a. With a neat sketch, explain the process of Filament winding. (07 Marks)
 b. With a neat sketch, explain the process of Pultrusion Technique. (07 Marks)
 c. With a neat sketch, explain the process of Blow moulding. (06 Marks)
3. a. With a neat sketch, explain the process of Water Jet cutting. (10 Marks)
 b. With a neat sketch, explain the process of Laser Beam cutting. (10 Marks)
4. a. Explain the Application of composites in Marine Industry and Recreational and Sport Goods. (10 Marks)
 b. Explain the current status and future potential for composites. (10 Marks)

PART – B

5. a. List the Important requirements of reinforcement materials, used in Metal Matrix Composites. (10 Marks)
 b. What is the need for developing Metal Matrix Composites ? (05 Marks)
 c. Write a note on Selection of base Metal, in Metal Matrix composites. (05 Marks)
6. a. With a neat sketch, explain the process of powder Metallurgy Technique. (10 Marks)
 b. With a neat sketch, explain the process of OSPREY Technique. (10 Marks)
7. a. Explain the Mechanical characteristics of Al - SiC composites. (10 Marks)
 b. Explain the influence of shape, size and distribution of particles of Mechanical properties of MMC's. (10 Marks)
8. a. Explain any two Applications of shape memory alloys. (12 Marks)
 b. Explain Pseudo Elasticity in Shape Memory Alloys. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Sixth Semester B.E. Degree Examination, June/July 2015
Composite Materials

Time: 3 hrs.

Max. Marks: 100

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

PART – A

- 1 a. Define composite material. Explain the need of composite material. (05 Marks)
b. Differentiate between thermo – plastics and thermo sets. (05 Marks)
c. What are the advantages and disadvantages of composite materials? (10 Marks)
- 2 With a neat sketch, explain the following processes :
a. Injection modeling (07 Marks)
b. Filament winding process (07 Marks)
c. Pultrusion. (06 Marks)
- 3 a. With a neat sketch, explain water jet cutting of composites. (10 Marks)
b. Explain the different types of joining of polymer matrix composites. (10 Marks)
- 4 Explain the applications of composites in the following fields :
a. Automobile industry
b. Marine industry
c. Electrical and electronics industry
d. Recreational and sports equipments. (20 Marks)

PART – B

- 5 a. Explain boron fibers and alumina fibers which is used as a reinforcement materials in metal matrix composites. (10 Marks)
b. What are the advantages, limitations and applications of MMC's? (10 Marks)
- 6 a. With a neat sketch, explain the poser metallurgy technique. (10 Marks)
b. With a neat sketch, explain the squeeze casting of metal matrix composites. (10 Marks)
- 7 a. Discuss the physical and mechanical properties of metal matrix composites. (12 Marks)
b. List the various advantages of MMC's over other types of composite materials. (08 Marks)
- 8 a. Explain pseudo elasticity in shape memory alloys. (05 Marks)
b. With a neat labeled diagram, discuss any two applications of shape memory alloys. (10 Marks)
c. Discuss the future potential of composites. (05 Marks)

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