Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

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M.Tech. (ME) (2020 Onwards) (Sem.–3)

COMPOSITE MATERIALS

Subject Code : MTME-221

M.Code : 74997

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1. a) Define composites. Explain various advantages and limitations of composite materials.

   b) What factors determine the behavior of composites? Explain these factors and relate them to general classes of composites.

2. a) Discuss in detail the following properties as applicable to composites :

      i) Thermal characteristics

      ii) Aging properties

      iii) Creep

   b) List the desired properties of matrix and reinforcement in a composite material.

3. a) List some fibres used in Metal Matrix Composites. List the merits and demerits of metal matrix composites.

   b) Explain the following giving appropriate examples :

      i) Fibre reinforced composites

      ii) Laminated composites

      iii) Hybrid composites

4. Explain the following processes giving neat sketches :

   a) Hand lay-up technique

   b) Injection moulding

5. a) Describe the current status and future potential for polymer matrix composites.

   b) Explain the powder metallurgy technique for the production of metal matrix composites giving a neat flow chart.

6. a) Describe two experimental methods to determine the mechanical properties of composite materials according to ASTM standards.

   b) In composite materials, explain the following parameters affect the stiffness and strength (i) aligned system, (ii) variable fibre orientation

7. a) Write short note on **any one** of the following :

      i) Joining of composites

      ii) Machine tool applications of composites

      iii) Ceramic matrix materials

   b) Elaborate on applications of composites in the field of Biomedical, Structural and Aerospace applications.

8. Write short notes on **any two** of the following :

   a) Liquid metallurgy route composites

   b) Spray up process

   c) Production of boron fibres

   d) Bag moulding process

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.