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Total Number of Pages : 1

M.TECH

M.TECH 2ND SEMESTER (AR 18) REGULAR EXAMINATIONS, APRIL/MAY 2019
COMPOSITE STRUCTURES

Branch: SE, Subject Code:MSEPE2032

Time: 3 Hours

Max Marks : 70

PART-A

(10 X 2=20 MARKS)

1. Answer the following questions.

- What do you mean by the term composite?
- What are the different types of matrices used for composite materials?
- What do you mean by thermoplastics?
- State the difference between micro-mechanics and macro-mechanics.
- What do you mean by shear modulus of a structure?
- What do you mean by laminates?
- What do you mean by particulate composite?
- What do you mean by the term, stacking sequence?
- Sate the formula for transverse modulus of composite as per rule of mixture.
- What do you mean by hygrothermic effect?

PART-B

(5 X 10=50 MARKS)

Answer any five questions from the following.

- Develop the constitutive relationship for a specially orthotropic material. [5]
 - Explain the differences between principal material axis system and reference axis system with neat sketches for each one. Why is it necessary for transformation of stresses and strains from one axis to another? [5]
- Discuss the theory of failure envelope with neat sketches. [5]
 - List down the advantages and disadvantages of sandwich construction. [5]
- Compute A_{ij} , B_{ij} , and D_{ij} , for a boron composite $(0/90)_2$ of total thickness 4mm. ($Q_{11} = 242.39$ GPa, $Q_{22} = 14.93$ GPa, $Q_{12} = 3.88$ GPa, $Q_{66} = 5.53$ GPa) [5]
 - Discuss the properties of glass fibers. [5]
- Derive the stress-strain relation for elastic behaviour of unidirectional lamina. [5]
 - Describe the manufacturing process of glass fiber. [5]
- What are the advantages and disadvantages of metal matrix? [5]
 - How do you classify the fiber reinforced composites based on the matrix used? Explain each category. [5]
- What is the mechanical coupling term in laminate stiffness? How do they influence the mechanical behaviour of laminate? [5]
 - Describe the significance and objectives of composite material science and Technology. [5]
- Write short notes on
 - Transformation matrix for strain [5]
 - Production of carbon and graphite fiber [5]