**Registration No:**

M.TECH 2^(ND) SEMESTER REGULAR EXAMINATIONS, MAY 2018
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.

|   |   |   |
|---|---|---|
| **a.** | Can concrete and mortar be termed as composite materials? Explain. | CO4 |
| **b.** | What do you mean by *particulate composite*? | CO1 |
| **c.** | In *ceramic matrix composite* category, state specific type of fibres and matrix used. | CO4 |
| **d.** | Distinguish between *fibre* and *resins*. | CO4 |
| **e.** | Give an example of a *regular angle-ply laminate.* | CO4 |
| **f.** | Distinguish between *micromechanics* and *macro mechanics.* | CO2 |
| **g.** | What is the role of transformation matrix [T]in composite mechanics? | CO3 |
| **h.** | State the formula for *transverse modulus* of a composite as per *rule of mixture*. | CO4 |
| **i.** | Distinguish between *symmetric* and *antisymmetric* laminates. | CO1 |
| **j.** | What do you mean by the term, *stacking sequence*? | CO3 |

## PART-B                                                    (5 X 10=50 MARKS)

### Answer any five questions from the following.

| | | |
|---|---|---|
| **2.** **a**. What are the different types of composites? | (5) | CO1 |
| **b.**Mention the applications of composite structures. | (5) | CO2 |
| | | |
| **3.** **a.** State the advantages and disadvantages of fibres. | (5) | CO4 |
| **b.**What are the properties of glass fibre? | (5) | CO4 |
| | | |
| **4.** **a**. Derive the strain displacement relation in linear form. | (5) | CO3 |
| **b**. State the assumptions for multi-directional laminate. | (5) | CO2 |
| | | |
| **5.** **a.**Discuss the various types of laminates with schematic diagram. | (5) | CO2 |
| **b**. Compute $A_{ij}$ , $B_{ij}$ , and $D_{ij,}$ for a boron composite $(0/90)_2$ of total thickness 4mm. | (5) | CO2 |

$Q_{11}$ = 242.39 GPa
$Q_{22}$ = 14.93 GPa
$Q_{12}$ = 3.88  GPa
$Q_{66}$ = 5.53 GPa

| | | |
|---|---|---|
| **6. a.**Discuss the varioustheories of failure. | (5) | CO3 |
| **b.**Discuss the thin plate theory. | (5) | CO4 |
| | | |
| **7. a.**Derive the equilibrium equation for isotropic plate. | (5) | CO2 |
| **b.**Differentiate between isotropic and composite materials. | (5) | CO2 |

**8.** **Write short notes on:(5x2)**

|   |   |   |
|---|---|---|
| **a.** | Isotropy and anisotropy | CO4 |
| **b.** | Coupling effects | CO3 |

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