GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

RM19002010

Registration No: | | | | | | | | | | |

Total Number of Pages : 1 **M.TECH**

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

MECHANICS OF COMPOSITE MATERIALS

Branch: MD, Subject Code:MMDPC2010

Time: 3 Hours **Max Marks : 70**

PART-A **(10 X 2=20 MARKS)**

1. Answer the following questions.

a) Why additives are used in composites materials?
b) What are Hybrid Composites?
c) How Orthotropic and Isotropic materials are different?
d) What are some of the most commonly used fiber types?
e) What are the assumptions in micro-mechanical studies of composites?
f) What are cremates? Give advantages of cremates?
g) What is a composite material?
h) What is stacking sequence? Elaborate with example.
i) Give a brief classification of composite material?
j) List some of the biomedical classification of composite material?

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

Answer any five questions from the following.

Q.2.

a) What are metal – matrix composites? Discuss their important properties and applications. [5]
b) Differentiate between natural and non – made composites. [5]

Q.3.

a) What is the relationship between the elements of the transformed compliance matrix for a 0 and 90° lamina? [5]
b) A uniaxial load is applied to a 10° ply. The linear stress–strain curve along the line of load is related as $\sigma x = 123€_x$, where the stress is measured in GPa and strain in m/m. Given E_1 = 180 GPa, E_2 = 10 GPa and ν12= 0.25, find the value of (1) shear Modulus, G_{12}; and Young's modulus E_x for a 60° ply. [5]

Q.4.

a) List the assumptions for plane stress condition. [5]
b) A unidirectional lamina which is treated under plane stress condition is subjected toa pure shear. Derive the relationship for compliance and stiffness matrix in terms of engineering elastic constants of a lamina. [5]

Q.5.

a Name any two matrices and two fibers and give the main advantages of each. [5]
b How is the mechanical advantage of composite measured? [5]

Q.6.

a) Explain with sketch resin transfer molding process [5]
b) Describe an injection molding process. [5]

Q.7.

a) Classify Composites materials [5]
b) Briefly describe about the advantages of using composite materials. [5]

Q.8.Write short notes on :

a) Lamina and laminate [5]
b) Micro mechanics and macro mechanics [5]

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