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**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023**

Semester : Semester VI -2020

Course Code : MEC3049

Course Name : Sem VI - MEC3049 - Mechanics of Composite Materials

Program : MEC

Date : 17-APR-2023

Time : 11:30AM - 1PM

Max Marks : 60

Weightage : 30%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. Write a short note on Autoclave method. (CO1) [Knowledge]
2. With suitable equation explain Logitudinal Young's modulus of composite materials. (CO1) [Knowledge]
3. With Suitable equation explain Transvers Young's modulus of composite materials. (CO1) [Knowledge]
4. List out different Classifications of composites. (CO2) [Knowledge]
5. Define Micromechanics of composites? (CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(3 X 10 = 30M)

6. With the help of Flow chart/Sketches explain the injection moulding method for production of fiber reinforced composites. (CO1) [Comprehension]
7. Find the longitudinal elastic modulus of a unidirectional glass/epoxy lamina with a 70% fiber volume fraction. Young's modulus of glass and epoxy are 85 GPa and 3.4 GPa, respectively. Also, find the ratio of the load taken by the fibers to that of the composite. (CO2) [Comprehension]

8. During the manufacture of a composite, voids are introduced in the composite, this causes the theoretical density of the composite to be higher than the actual density. Also, the void content of a composite is detrimental to its mechanical properties. What is the relation between volume fraction in terms of void content?

(CO2) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

9. Powder Metallurgy Technique is widely used in Manufacturing Metal matrix composites. Discuss the steps involved during the production of a product using Powder Metallurgy Techniques with suitable diagram .

(CO2) [Application]