MCL 133 NEAR NET SHAPE MANUFACTURING

Minor 2 | 21-03-15 SATURDAY 1-2 pm | V 315 | Marks : 7+14 = 21

Answer all the questions. Be brief and specific in your answers. Wherever required, draw suitable sketches. PART A and PART B should be answered in separate answer booklets.

PART A

Q1. For a UD Graphite epoxy lamina having E_1 = 181 GPa, E_2 = 10.3 GPa, G_{12} = 7.17GPa, and υ_{12} = 0.28;

a) **find the compliance and stiffness matrix**

b) **find the strains in the 1-2 coordinate system, if the applied stresses are σ_1 = 2 MPa, σ_2 = -2 MPa, and τ_{12} = 0.5 MPa** (5)

Q2. If the lamina above is having fibers oriented at -45°, can you obtain?

i) **Transformed compliance matrix and**

ii) **Transformed reduced stiffness matrix.** (2)

PART B

Q3. Discuss the solubility of hydrogen in aluminum melt and briefly describe the methods of degassing (2+4)

Q4. Write the difference between (8)

j) **Shrink and skim bob**

ii) **Splash and strainer cores**

iii) **Open and blind riser**

iv) **Oxide and bifilm impurities**