

Time: 3 hours

Max. Marks: 80

- Note:** 1. Assume suitable data if necessary
 2. Figures to the right indicate full marks
 3. Question No. 1 is compulsory
 4. Solve any three out of the remaining five questions

Q1. Solve any four

- A Explain the phenomenon of composite materials **5**
 B Explain the stiffness and compliance matrix for Anisotropic and Orthotropic materials. **5**
 C Explain the Plain stress assumption for composite lamina **5**
 D Explain the laminates codes **5**
 E Write short note on mechanical properties of Lamina **5**
 F Explain with neat diagram all the levels of a generic repair design. **5**

Q2.

- A Derive an expression of Hook's law for a Two-Dimensional Unidirectional lamina. **10**
 B Explain with neat diagram the working of spray Lay-up method for composite materials with advantages and disadvantages. **5**
 C Write short note on significance of strength ratio **5**

Q3.

- A Differentiate between Vacuum Infusion and Vacuum Bagging techniques for composite manufacturing on the basis of diagram, set-up, operation, advantages, disadvantages and applications. **10**
 B Illustrate with neat sketch the Radiographic Inspection method **5**
 C Explain the selection criteria for repair methods for composites. **5**

Q4.

- A Derive an expression of failure criteria with failure envelope according to Maximum Strain theory. **10**
 B Illustrate with neat sketch the ultrasonic method of inspection for composites. **5**
 C Explain repair method in composites. **5**

Q5.

- A Differentiate between the passive and active methods of thermography inspection based on principle, construction, working, pros and cons of methods. **10**
 B Write short note on repair criteria **5**
 C Illustrate with neat sketch the resin transfer moulding technique. **5**

Q 6.

- A Explain various types of defects may occur in composite parts **10**
 B Write short note on Laminate Design **5**
 C Explain Industrial Autoclave **5**
