



ML 372 MATERIALS ASPECTS IN DESIGN

Time: 3Hr

Max.Mark:100

Answer ALL Questions

Part -A (10x2=20 Marks)

1. What is your understanding on 'Engineering Design'?
2. How the recycling aspects involved in design
3. Continuous welding in the length direction is not advisable – True or false justify your answer
4. What are the ecological impacts of material?
5. Distinguish between interchangeability and selective assembly
6. Which natural material has the maximum use (by weight and volume)?
7. What circumstances the principle stress should be taken into consideration for design?
8. What is stress concentration?
9. Which is the most used polymer (by weight).
10. What are the design criteria to design against fatigue?

Part – B (5x16 = 80 Marks)

- 11 Explain how the properties of the following materials are important for the purpose of the objects mentioned
- (i) Nickel - Jet engine (4)
 - (ii) Copper-air-conditioning plant (4)
 - (iii) CFRP-aircraft (4)
 - (iv) Super alloys-Turbine (4)
- 12a Explain how the designing of structures are done using the concept of materials indices. (16)
- OR**
- 12b Explain the basic rules of design for manufacturability and assembly (16)
- 13a Explain different types of fits and tolerances. How this is used in the assembly design (16)
- OR**
- 13b Civil structures are designed for static loading and shock loading (i.e. earth quakes). Why did the Tacoma Bridge fail, though it was strong enough to support its weight and payload and had a factor of safety for peak loads (16)
- 14a The shape of a material can have decisive effect on the performance of a component. Explain the effects of shapes for different loading conditions (16)

OR

14b Discuss the design considerations for designing shaft and spring (16)

15a Discuss the concepts of design for brittle fracture and corrosion resistance (16)

OR

15b Discuss properties of carbon in relation to bonding, crystal structure, and molecular size. (16)