

R16

Code No: 138FV

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, July - 2021

DESIGN AND SELECTION OF ENGINEERING MATERIALS

(Common to ME, MCT)

Time: 3 hours

Max. Marks: 75

**Answer any Five Questions
All Questions Carry Equal Marks**

- 1.a) Explain the characteristics of various materials used in engineering practice.
- b) Young's modulus E for copper is 120 GPa, its Poisson's ratio ν is 0.342. What is its shear modulus, G ? [7+8]
- 2.a) Explain the criteria for selection of materials for engineering design.
- b) Discuss the strategy for material selection for a particular purpose. [7+8]
3. What is the effect of structure on material properties? Explain in detail. [15]
4. Discuss a case study on properties versus performance of intermetallics and aluminides. [15]
5. Discuss a case study on properties versus performance of the materials for defense applications. [15]
6. Discuss a case study on the design of an alloy for nuclear fission reactors. [15]
7. Illustrate the Young's modulus – density chart for designing metal matrix composites. [15]
8. Discuss the manufacturing aspects of design for special materials. [15]

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