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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)**B.Tech II Year I Semester Supplementary Examinations July-2022****MATERIAL SCIENCES AND METALLURGY**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

**UNIT-I**

- 1 What are the various types of solid solutions? Explain with examples. L1 12M

**OR**

- 2 a Draw a neat sketch of FCC crystal structure and calculate its packing factor, coordinate number. L4 6M
- b Explain the Electron compound. L1 6M

**UNIT-II**

- 3 What are the eutectoid and eutectic reactions in Cu-Ni & Al-Cu binary phase diagram. L1 12M

**OR**

- 4 Draw and explain the Fe-Fe<sub>3</sub>C phase diagram invariant reactions. L4 12M

**UNIT-III**

- 5 Explain the structure and properties of Grey cast iron. L1 12M

**OR**

- 6 Explain the structure and properties of below steel L1 12M
- i) Hadfield manganese steels                      ii) tool and die steels

**UNIT-IV**

- 7 Explain the below L1 12M
- i) surface - hardening methods      ii) Age hardening Treatment

**OR**

- 8 Explain the below L1 12M
- i) Tempering                                      ii) Hardenability

**UNIT-V**

- 9 Why are fiber glass reinforced composites used extensively? L1 12M

**OR**

- 10 What is the polymer? Explain the polymer matrix composite. L1 12M

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