

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech I Year II Semester Supplementary Examinations May/June-2024**

**MATERIALS ENGINEERING**

(Mechanical Engineering)

**Time: 3 Hours**

**Max. Marks: 60**

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

**UNIT-I**

- 1 Explain the effect of grain boundaries on the properties of alloys, also determine the grain size. CO1 L2 12M

OR

- 2 What is Material science and metallurgy? Explain the Types of Bonds in solids with neat sketches CO1 L1 12M

**UNIT-II**

- 3 What are the eutectoid and eutectic reactions in Cu-Ni & Al-Cu binary phase diagram. CO2 L1 12M

OR

- 4 a Explain the phase transformation in solid state CO2 L2 6M  
b Draw the allotropy of iron and their properties. CO2 L1 6M

**UNIT-III**

- 5 Explain the structure and properties of Copper and its alloys. CO3 L2 6M

OR

- 6 a What is Effect of alloying elements on Iron – Iron carbon system? CO3 L1 6M  
b Write Classification of Steels. CO3 L2 6M

**UNIT-IV**

- 7 a Explain the toughness .How it is measured and explain their types? CO4 L2 6M  
b Explain the Hardness . How it is measured and explain their types? CO4 L2 6M

OR

- 8 a What is the purpose of using normalizing, Annealing and Hardening. CO4 L1 6M  
b Explain about various Hardening process use for alloys? CO4 L2 6M

**UNIT-V**

- 9 a What are glasses? How they manufacture? CO5 L1 6M  
b Discuss about the Glass micro structure and properties. CO5 L2 6M

OR

- 10 Why are fiber glass reinforced composites used extensively? CO5 L4 12M

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