

**Reg. No:**

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

**B.Tech I Year II Semester Regular Examinations October-2020**

**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. **12M**

**OR**

- 2** Draw a neat sketch of HCP and Simple cubic crystal structure and calculate its packing factor, coordinate number. **12M**

**UNIT-II**

- 3 a** What is Phase? What are different types of phase diagram? **4M**  
**b** Define invariant reactions in phase Diagram with and examples. **8M**

**OR**

- 4 a** Draw the Eutectoid system diagram. **4M**  
**b** Explain and Draw the Equilibrium cooling and heating of pure metals/alloys system. **8M**

**UNIT-III**

- 5** Explain the structure and properties of Copper and its alloys? **12M**

**OR**

- 6 a** What is steel? What are the classifications of the steels? **6M**  
**b** Explain the structure and properties of malleable cast iron. **6M**

**UNIT-IV**

- 7** Write about Annealing, normalizing, Hardening. Draw and explain the structures. **12M**

**OR**

- 8** What is Fracture Mechanism? Explain the mechanical properties of materials and Fracture. **12M**

**UNIT-V**

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

**OR**

- 10 a** How the cermets manufactured? Give Examples. **6M**  
**b** Explain the polymer matrix composite. **6M**

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