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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**B.Tech I Year II Semester Supplementary Examinations March-2021****MATERIALS ENGINEERING**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

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|---|---|--|----|
| 1 | a | Explain any four mechanical properties that a material should possess. | 2M |
| | b | What are the various constituents in iron-carbon equilibrium diagram? | 2M |
| | c | Why Copper is used in electrical appliances. | 2M |
| | d | What are glasses? Give two examples. | 2M |
| | e | How are cast irons classified? | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

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|---|---|--|----|
| 2 | a | Draw a neat sketch of HCP and SCC structure and derive its packing factor | 5M |
| | b | Explain the necessity of alloying. Name some common alloys in engineering applications | 5M |

OR

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|---|---|---|----|
| 3 | a | Draw a neat sketch of BCC structure and determine its packing factor. | 5M |
| | b | Explain Crystal Imperfections. | 5M |

UNIT-II

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| 4 | Explain Iron-Iron Carbide diagram with neat sketch and mark on it various transformations, reactions and temperatures. | 10M |
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| 5 | a | Explain lever rule with Tie line. | 5M |
| | b | Draw an equilibrium Diagram for Isomorphous system. | 5M |

UNIT-III

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|---|---|---|----|
| 6 | a | Explain the structure and properties of a grey cast iron. | 5M |
| | b | Explain the advantages and applications of titanium alloys. | 5M |

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| 7 | a | Explain the applications and advantages of Copper alloys. | 6M |
| | b | What is difference between Ferrous and Non-ferrous alloys? | 4M |

UNIT-IV

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| 8 | a | Explain any two surface hardening methods. | 6M |
| | b | Explain TTT curve with neat sketch. | 4M |

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| 9 | a | What is the difference between Annealing and Normalizing? | 5M |
| | b | What is Age hardening treatment? | 5M |

UNIT-V

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| 10 | a | Explain metal matrix composites with examples. | 5M |
| | b | Explain any two methods of composites manufacture. | 5M |

OR

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| 11 | a | Why are Fibre reinforced composites used extensively. | 5M |
| | b | Explain Cermets and their properties. | 5M |

END