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

**B.Tech I Year II Semester Supplementary Examinations July-2021**

**MATERIALS ENGINEERING**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

**PART-A**

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

- |   |   |  |    |
|---|---|--|----|
| 1 | a | Define Ductility and hardness.                             | 2M |
|   | b | What is a peritectic reaction.                             | 2M |
|   | c | List any two properties and applications of grey cast iron | 2M |
|   | d | Differentiate Annealing and Normalizing                    | 2M |
|   | e | Define Composite with an example                           | 2M |

**PART-B**

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

**UNIT-I**

- |   |  |     |
|---|--|-----|
| 2 | Explain the effect of grain boundaries on the properties of alloys, also determine the grain size. | 10M |
|---|--|-----|

**OR**

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|---|---|---|----|
| 3 | a | Give a brief note on intermediate alloy phases. | 5M |
|   | b | Explain the Electron compound.                  | 5M |

**UNIT-II**

- |   |   |  |    |
|---|---|--|----|
| 4 | a | What is Phase? What are different types of phase diagram?    | 3M |
|   | b | Define invariant reactions in phase Diagram with an examples | 7M |

**OR**

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|---|--|-----|
| 5 | Draw and explain the Fe-Fe <sub>3</sub> C phase diagram invariant reactions? | 10M |
|---|--|-----|

**UNIT-III**

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|---|---|---|----|
| 6 | a | What is steel? What are the classifications of the steels?          | 5M |
|   | b | Explain the structure and properties of Spheroid graphite cast iron | 5M |

**OR**

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|---|---|-----|
| 7 | Explain the structure and properties of Copper and its alloys | 10M |
|---|---|-----|

**UNIT-IV**

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|---|---|--|----|
| 8 | a | Explain the Hardness. How it is measured and explain their types?  | 6M |
|   | b | What is the purpose of using normalizing, Annealing and Hardening? | 4M |

**OR**

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|---|---|-----|
| 9 | What are TTT diagrams? How they prepared? What is their significance? | 10M |
|---|---|-----|

**UNIT-V**

- |    |   |  |    |
|----|---|--|----|
| 10 | a | What are cermets? what are their properties? | 5M |
|    | b | How the cermets manufactured? Give Examples. | 5M |

**OR**

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|----|---|-----|
| 11 | What is composite material? How is it classified? Give short notes. | 10M |
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