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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**B.Tech I Year II Semester Supplementary Examinations October-2020****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 | <ul style="list-style-type: none"> a What is the necessity of alloying? 2M b Explain lever rule with neat sketch. 2M c Explain two differences between hardness and toughness. 2M d Explain any four properties of copper. 2M e What is a ceramic material? 2M | |
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PART-B

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

UNIT-I

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| 2 | <ul style="list-style-type: none"> a Explain Hume Rothery rules in Solid Solutions. 5M b What are the various types of bonds present in solids? 5M | |
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OR

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| 3 | <ul style="list-style-type: none"> a What are the various types of Solid solutions? Explain in detail. 5M b Explain crystal imperfections. 5M | |
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UNIT-II

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| 4 | <ul style="list-style-type: none"> a Explain In-variant reactions in phase diagrams. 5M b Explain Allotropy of Iron with neat sketch. 5M | |
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| 5 | <ul style="list-style-type: none"> a Explain Iron-Iron Carbide diagram with neat sketch. 5M b Explain an Isomorphous system with an example. 5M | |
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UNIT-III

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| 6 | <ul style="list-style-type: none"> a Explain the structure and properties of white cast iron. 5M b Explain the various properties of Aluminum and its alloys. 5M | |
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| 7 | <ul style="list-style-type: none"> a How are steels Classified? Explain. 6M b What is the effect of alloying elements on Iron-Iron carbon system? 4M | |
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UNIT-IV

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| 8 | <ul style="list-style-type: none"> a Explain Annealing with neat sketch. 6M b Explain Hardening process with neat sketch. 4M | |
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| 9 | <ul style="list-style-type: none"> a What are TTT Diagrams? What is its significance? 5M b What is Cryogenic treatment? Explain. 5M | |
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UNIT-V

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| 10 | <ul style="list-style-type: none"> a What are Glasses? How they are manufactured? 5M b Explain Metal matrix properties. 5M | |
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| 11 | <ul style="list-style-type: none"> a How the cermets are manufactured? Explain. 5M b Enumerate the difference between particle and reinforced composites. 5M | |
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END