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

B.Tech I Year II Semester Supplementary Examinations February-2022

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 Define alloy. Explain its necessity.
b What is an Isomorphous system.
c Mention the elements present in Hadfield manganese steel.
d Define Tempering.
e Mention the types of glasses. | 2M
2M
2M
2M
2M |
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PART-B

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

UNIT-I

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|----------|--|------------------------|
| 2 | a Draw a neat sketch of FCC crystal structure and calculate its packing factor, coordinate number.
b Draw a neat sketch of BCC crystal structure and calculate its packing factor, coordinate number. | 5M
5M |
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OR

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| 3 | What are the various types of solid solutions? Explain with examples. | 10M |
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UNIT-II

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| 4 | What are the eutectoid and eutectic reactions in Cu-Ni & Al-Cu binary phase diagram? | 10M |
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OR

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| 5 | a Draw an equilibrium diagram for an isomorphism system.
b Explain An isomorphism system of your choice to scale and label all the points and its important features. | 5M
5M |
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UNIT-III

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| 6 | a Explain the structure and properties of malleable cast iron
b Explain the structure and properties of Ductile cast iron | 5M
5M |
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OR

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| 7 | Explain the structure and properties of Grey cast iron. | 10M |
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UNIT-IV

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| 8 | a Explain the toughness .How it is measured and explain their types
b Explain about various Hardening process use for alloys? | 6M
4M |
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OR

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| 9 | What is Fracture Mechanism? Explain the mechanical properties of materials and Fracture. | 10M |
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UNIT-V

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| 10 | a What are glasses? How they manufacture?
b Discuss about the Glass micro structure and properties | 5M
5M |
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OR

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| 11 | a What is ceramic material? Explain crystalline ceramics
b Enumerate the difference between the particle and Reinforced composites. | 5M
5M |
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END