

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

B.Tech II Year II Semester Regular & Supplementary Examinations June-2024

MATERIALS SCIENCE

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

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|---|---|-----|----|----|
| 1 | a What is Material science? List out classification of materials. | CO1 | L1 | 6M |
| | b Explain the primary type of Bonds in solids with neat sketches. | CO1 | L2 | 6M |

OR

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|---|---|-----|----|-----|
| 2 | What are the various types of solid solutions? Explain with examples. | CO1 | L1 | 12M |
|---|---|-----|----|-----|

UNIT-II

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|---|--|-----|----|----|
| 3 | a Evaluate Gibbs Phase rule, What are the uses of phase diagram. | CO2 | L4 | 6M |
| | b Define single and multiphase solids with examples. | CO2 | L1 | 6M |

OR

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|---|--|-----|----|-----|
| 4 | Draw and explain the Fe-Fe ₃ c phase diagram invariant reactions. | CO2 | L1 | 12M |
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UNIT-III

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| 5 | a What is steel? What are the classifications of the steels? | CO3 | L1 | 6M |
| | b Explain the structure and properties of Spheroidal graphite cast iron? | CO3 | L2 | 6M |

OR

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|---|--|-----|----|-----|
| 6 | Explain the structure and properties of Aluminum and its alloys. | CO3 | L2 | 12M |
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UNIT-IV

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|---|--|-----|----|----|
| 7 | a Explain the toughness. How it is measured and explain their types? | CO4 | L2 | 6M |
| | b Define heat treatment. List out the stages in the heat treatment. | CO4 | L1 | 6M |

OR

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| 8 | Evaluate the following fractures
(i) Ductile fracture (ii) Brittle fracture | CO4 | L5 | 12M |
|---|--|-----|----|-----|

UNIT-V

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|---|--|-----|----|-----|
| 9 | What are the various methods of component manufacture of composites? Briefly explain any one method. | CO5 | L1 | 12M |
|---|--|-----|----|-----|

OR

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|----|---|-----|----|-----|
| 10 | Explain the Ceramic matrix composite. Discuss about their properties. | CO5 | L2 | 12M |
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