

Reg. No:

--	--	--	--	--	--	--	--	--	--

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

B.Tech II Year I Semester Supplementary Examinations December-2021

MATERIAL SCIENCES AND METALLURGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a What is Hume Rothery, s rules? Discuss in detail. 6M
b Explain crystal imperfections. 6M

OR

- 2 a Draw a neat sketch of FCC crystal structure and calculate its packing factor, coordinate number. 6M
b Draw a neat sketch of BCC crystal structure and calculate its packing factor, coordinate number. 6M

UNIT-II

- 3 a What is Phase? What are different types of phase diagram? 6M
b Define invariant reactions in phase Diagram with an example. 6M

OR

- 4 a Draw an equilibrium diagram for an isomorphism system. 6M
b Explain An isomorphism system of your choice to scale and label all the points and its important features. 6M

UNIT-III

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

OR

- 6 a Explain the structure and properties of malleable cast iron. 6M
b Explain the structure and properties of Ductile cast iron. 6M

UNIT-IV

- 7 a Explain the toughness How it is measured and explain their types? 6M
b Explain the Hardness. How it is measured and explain their types? 6M

OR

- 8 a What is the purpose of using normalizing, Annealing and Hardening? 6M
b Explain about various Hardening process use for alloys? 6M

UNIT-V

- 9 a Enumerate the difference between the particle and Reinforced composites. 6M
b What is ceramic material? Explain crystalline ceramics. 6M

OR

- 10 a What are cermet? what are their properties? 6M
b How the cermet manufactured? Give Examples. 6M

*** END ***