

Roll No.

Total No. of Questions : 09]

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B.Tech. (Sem. - 3rd)
ENGINEERING MATERIALS AND METALLURGY

SUBJECT CODE : ME - 205

Paper ID : [A0860]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

(10 × 2 = 20)

- a) What do you mean by space lattice?
- b) Define polymorphism.
- c) What is the mechanism of plastic deformation?
- d) Discuss applications of heat treatment.
- e) Explain the phenomenon of slip.
- f) What is the purpose of tempering?
- g) State the objects of "annealing".
- h) What factors influence the critical cooling rate?
- i) List various defects in Heat treatment.
- j) Define twinning.

Section - B

(4 × 5 = 20)

- Q2) Explain nuclear formation/crystal growth and crystal imperfections.
- Q3) What is phase rule? What information may be obtained from an equilibrium diagrams?
- Q4) How engineering materials are classified? What are various physical properties of materials?
- Q5) Draw face centered cubic and body centered cubic crystal lattice.
- Q6) What are the different heat treatment processes?

Section - C

(2 × 10 = 20)

- Q7) What is a TTT Diagram? Draw and explain.
- Q8) Write short notes on any two :
- (a) Surface hardening.
 - (b) Hardenability.
 - (c) Theories of plastic deformation.
- Q9) Discuss effect produced by alloying Si, Ni, Cr and Mn on properties and structure of steel.

