

(2 Hours)

Total Marks: 60

- N.B.** (1) Question no. 1 is compulsory.
 (2) Attempt any three questions out of remaining questions.
 (3) Illustrate your answer with necessary sketch wherever necessary.
 (4) Figures to the right indicate full marks.
- Q.1.** Attempt any Three: 15
- (a) Write note on point defects. 5
 (b) Explain the purpose of annealing and normalising. 5
 (c) Illustrate and explain an isomorphous phase diagram. 5
 (d) How does hot working differ from cold working? 5
- Q.2.**
- (a) Define Fatigue and Creep. 4
 (b) What are the stages of creep, explain with the creep curve. 5
 (c) Draw and explain the S-N curve. 6
- Q.3.**
- (a) Draw the Fe-Fe₃C diagram, label fully mentioning all important temperatures and compositions. 8
 (b) Explain the cooling of 0.8 % C steel. 7
- Q.4.**
- (a) What are the stages of recrystallisation annealing? 8
 (b) What are the different types of cast irons? Explain properties and applications, also draw any one microstructure. 7
- Q.5.**
- (a) Differentiate between case hardening and surface hardening. Explain any one of the case hardening methods. 8
 (b) What are dislocations? How do they affect material behavior? 7
- Q. 6.**
- (a) How does Ductile to Brittle Transition Temperature influence the material behavior? 4
 (b) Derive an expression for Critical Resolved Shear Stress. 5
 (c) What are stainless steels? Give classification, and also discuss their applications. 6
