

Q.P. Code:13964

(3 Hours)

[Total Marks: 80]

- N. B. 1) Question No. 1 is compulsory.
 2) Attempt any three questions from remaining five questions.
 3) Figures at right indicate marks.
 4) Draw neat well labeled sketches.

- Q. 1 Write note on any four:- (20)
- Austempering
 - Creep mechanism.
 - Effect of Alloy on TTT diagram.
 - Factors governing formation of substitutional solid solution.
 - Thermal Fatigue
- Q. 2 A) What do you mean by Nano-materials? Explain their properties and practical applications. (7)
- B) What is Fatigue? Explain fatigue testing in detail. (7)
- C) Explain Carburizing treatment. (6)
- Q. 3 A) Draw Fe-Fe₃C Diagram and give all critical temperatures. (7)
- B) How dislocations are generated at Frank Reed Source? Explain dislocation Jog. (7)
- C) Explain general effect of alloying element on Fe-c dia and properties of material. (6)
- Q. 4 A) Draw and explain construction of Time Temperature Transformation (TTT) diagram. (7)
- B) Derive an expression for Griffith theory of brittle fracture. Explain Orowan's Modification. (7)
- C) Explain Induction Hardening. (6)
- Q. 5 A) What are the type's deformation? Explain mechanism of plastic deformation. (7)
- B) Classify crystal Imperfections. Explain Edge and Screw dislocation. (7)
- C) Explain creep test and Andrade's analysis of creep curve. (6)
- Q. 6 Write short note on any four (20)
- FCC to BCT conversion (Bain's model)
 - Tempering
 - Strain Aging
 - Hardenability test
 - Normalizing