

Time: 3 Hour

Max. Marks: 80

N. B.

- 1) Question No.1 is compulsory.
- 2) Attempt any three questions from the remaining five questions.
- 3) All questions carry equal marks.

- Q1. Write short notes on any FOUR [20]
- (a) Classification of Engineering Materials
  - (b) Allotropic form of iron
  - (c) Full annealing
  - (d) Ductile to Brittle Transition Temperature (DBTT)
  - (e) Shape Memory alloy
- Q2. (a) Classify crystal imperfections. Distinguish between edge and screw dislocation. [10]
- (b) Draw the Iron-Iron carbide equilibrium diagram and write the important transformation seen in the diagram. [10]
- Q3. (a) What is Hardenability? What are the factors affecting it? Explain the Jominy End Quench test. [10]
- (b) Define Creep. Draw a Classical Creep Curve. Explain different stages of Creep. [10]
- Q4. (a) Explain annealing and its types with appropriate examples. [10]
- (b) What is Fatigue of Metals? Explain fatigue testing and interpretation of S-N curve for ferrous and non-ferrous metals. [10]
- Q5. (a) State and explain Griffith's theory for brittle material with derivation. [10]
- (b) Write a short note on Smart material. [6]
- (c) How dislocations are generated at Frank Reed Source? [4]
- Q6. (a) What is ceramics and explain the processing of it with a diagram? [8]
- (b) Explain Magnetic Particle Testing with neat sketch [8]
- (c) Write a note on composites and its applications. [4]

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