

(3 Hours)

[Total Marks : 80]

- N.B. (1) Question no. 1 is compulsory.  
 (2) Attempt any **three** questions out of remaining five questions.  
 (3) **Assume** suitable data if necessary.  
 (4) **Figures to the right** indicate full marks.

1. Write short notes on:- 20
  - (a) Edge dislocation and its significance.
  - (b) Austempering
  - (c) Fatigue and significance of cyclic stress
  - (d) Powder metallurgy
  - (e) Eutectoid type of alloy phase diagram
2.
  - (a) State and explain various types of ingot defects and suggest remedies for these defects. 10
  - (b) Explain toughening mechanism in ceramics and write applications of ceramics. 10
3.
  - (a) Draw a neat and labelled Fe-FeC diagram and state its limitations. 10
  - (b) How are composites classified? Explain the rule of mixtures in composites. 10
4.
  - (a) Define Creep. Write about creep testing, data representation and analysis. 10
  - (b) Explain about the effect of alloying elements on ferrite, carbide, austenite and phase transformation. 10
5.
  - (a) Draw and label a TTT diagram for 0.8% carbon steel Superimpose various Cooling curves on it and explain the processes. 10
  - (b) Explain the application of lever rule in the context of phase diagrams. Illustrate your answer with the help of neat sketches. 10
6. Write short notes on:- 20
  - (a) Martempering
  - (b) Normalising
  - (c) Flame hardening and induction hardening
  - (d) Carburizing