QP Code : **3519**

(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

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