

(REVISED COURSE)

QP Code : 1531

(3 Hours)

[Total Marks : 100]

- N.B:** (1) Question No. 1 is compulsory.
 (2) Attempt any FOUR questions from remaining six questions.
 (3) Figures to the right indicate full marks
 (4) Illustrate the answer with neat sketches wherever required.
 (5) Answers to questions should be grouped & written together.

1. Write Short notes on **any four** of the following: (20)
 - (a) Allotropic forms of Iron
 - (b) Ausforming
 - (c) Diffusion Annealing
 - (d) Yield Point Phenomenon
 - (e) Effect of alloying elements on phase transformation
2. (a) Define Fracture and give a brief classification of fracture. State Griffith's theory of brittle fracture and derive Griffith's equation. 10
 (b) Draw the Fe-Fe₃C equilibrium diagram and write the important transformations seen in the diagram. 10
3. (a) Define Creep. Explain Creep Testing method and data presentation and analysis. 10
 (b) What are High Speed Tool Steels? Explain the various stages in the hardening treatment of HSS (18-4-1). 10
4. (a) Explain how dislocations are generated using the Frank Reed Source. 10
 (b) What are Stainless Steels? Give a brief classification of stainless steels. Discuss and mention their applications. 10
5. (a) What is Critical Resolved Shear Stress? Derive an expression for Critical Resolved Shear Stress. 10
 (b) What is Diffusion Coating? Name its different methods. Discuss any one process of diffusion coating in details on basis of principle, process, advantages and applications. 10
6. (a) Define fatigue failure. Explain the mechanism of fatigue and theories of fatigue failure. 10
 (b) What is the purpose of Tempering heat treatment process? Explain the various types of tempering heat treatment process. 10
7. Differentiate between (**Any four**) 20
 - (a) Isomorphous systems and Eutectic systems
 - (b) Slip and Twinning
 - (c) Elastic Deformation and Plastic Deformation
 - (d) Annealing and Normalizing
 - (e) Age hardening and Precipitation hardening

QP-Con.12303-15.