

12/17

(3 Hours)

[Total Marks: 80]

N.B. (1) Question no.1 is compulsory

(2) Answer any 3 questions out of the remaining questions.

(3) Assume suitable data if necessary.

Q.1. Write Short notes on the following: --

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- (a) Stainless Steels.
- (b) Crystal Defects.
- (c) Induction Hardening.
- (d) Biomaterials.

Q.2. (a) Explain the phase diagram for two metals which are completely soluble in liquid and solid states. Also, explain the rules used for finding the composition of phases and relative amounts of each phase. 10

(b) Differentiate between edge and screw dislocations. 10

Q.3. (a) What do you mean by TTT diagram? Plot the diagram for 0.8% carbon steel and superimpose various cooling curves on it to describe the end products of such transformations. Also explain the concept of critical cooling rate. 10

(b) Elaborate about the effect of alloying elements on ferrite, carbide and austenite. 10

Q.4. (a) Explain the difference between hardening and hardenability. Also explain Jominy End quench test for measurement of hardenability. 10

(b) Define creep and elaborate the method used for testing it. 10

Q.5. (a) Briefly, explain FRP. 05

(b) Explain the heat treatment processes of Hardening and Tempering. 10

(c) Describe with examples the concept of smart materials. 05

Q.6. Write short notes on :- 20

- (a) Tool Steels.
- (b) Classification of Ferrous Metals.
- (c) Alloys of Copper.
- (d) Bainite.
