

(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: -- 20
- (a) Powder metallurgy.
  - (b) Edge and screw dislocations.
  - (c) Classification of cast irons.
  - (d) Rules of mixtures in composites.
- Q.2. (a) Draw iron- iron carbide phase diagram and explain various phase transformation reactions from different regions of the diagram. 10
- (b) State and explain various types of ingot defects and suggest remedies for these defects. 10
- Q.3. (a) Write short note on how composites are classified on the basis of matrix material. Give example of each type with applications. 10
- (b) Explain in brief at least two types of stainless steel in terms of properties and applications. 10
- Q.4. (a) Compare in the form of a table, the properties of engineering ceramics with the properties of metallic alloys, giving relevant examples of applications. 10
- (b) Write short note on creep testing, data representation and analysis. 10
- Q.5. (a) Write about the unique features of Nano-structured materials. 5
- (b) Define hardenability? How is hardenability determined? Explain Jomny end quench hardenability test. 10
- (c) Distinguish between Cyaniding and Carbonitriding. 5
- Q.6. Write short notes on :- 20
- (a) Eutectoid type of alloy phase diagram.
  - (b) Fatigue failure.
  - (c) Alloys of Aluminium.
  - (d) Recovery, Recrystallization and Grain Growth.

\*\*\*\*\*