

[Time: **THREE Hours**]

[Max. Marks: **80**]

“Please check whether you have got the right question paper.”

N.B

i) Solve any three questions from each section.

ii) Figures to the right indicate full marks.

iii) Assume suitable data wherever required.

iv) Draw suitable diagram if required.

SECTION A

- Q.1 a) With a neat sketch explain the dendritic growth. Also explain the term unit cell 07
b) What are different types of crystal defects? Explain Line defect. 06
- Q.2 a) What is Bauschinger effect? What is its significance in studying it. 07
b) What is Hume Rothery's rules? Explain them. 06
- Q.3 a) Explain the terms 06
i) Coordination number ii) Polymorphism
b) What is solid solution Strengthening? Explain 07
- Q.4 a) Draw a neat sketch of TTT diagram and state what information is made available by TTT diagram that was lacking in Fe- c equilibrium 07
b) State the purpose of Annealing heat treatment and explain the process 06
- Q.5 Write short note on any two 14
i) Miller Indices ii) Hardening heat treatment iii) Phases on Fe-C diagram
- SECTION B**
- Q.6 a) What are different alloying elements in alloy steel? List them. also state the effect of alloying elements 07
b) What is martensitic stainless steel? Explain ,giving its application 06
- Q.7 a) With neat sketch explain the method of production of malleable cast iron 07
b) What are properties of tool steel? Explain HSS tool steel 06
- Q.8 a) What is $\alpha - \beta$ brass? Explain important brasses from this group 07
b) Explain Beryllium bronzes in detail 06
- Q.9 a) What is a composite material? Explain polymer based composite with example 07
b) State the important of Nano technology and its examples of application 06
- Q.10 Write short note on any two 14
i) Aluminium alloys ii) Grey cast iron iii) Nitriding