

Seat
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मठ - 004

Material Science & Metallurgy (123104)

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Figures to right indicate full marks.
5. Write **any two** questions from each unit.
6. Draw neat and clean diagrams wherever necessary.

UNIT - I

1. a) Explain work hardening ? 4
b) What are different defects in crystal structure ? 4
2. Explain cold working with recovery, recrystallization and grain growth ? 8
3. Enlist different strengthening mechanisms. Explain dispersion and precipitation hardening. 8

UNIT - II

4. Explain Brinell Hardness test. 8
5. a) Give difference between charpy and Izod test. 4
b) Explain fatigue test and list the methods to prevent fatigue cracks. 4
6. a) Explain ultrasonic testing. 4
b) Give difference between destructive and non-destructive testing. 4

UNIT - III

7. Draw and explain Iron - carbide equilibrium diagram. 8

8. Explain microstructure of slowly cooled steel. 8
9. Explain Gray cast Iron and Malleable cast Iron. 8

UNIT - IV

10. Draw and explain T - T - T diagram. 8
11. Give difference between :
a) Annealed and normalised component. 4
b) Carburising and Nitriding. 4
12. Give classification of different heat treatment furnaces and explain muffle furnace. 8

UNIT - V

13. What are different effects of alloying elements. 8
14. Explain weld decay and methods to avoid it. 8
15. Draw and explain heat treatment cycle of high speed tool steel. 8
