

2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH I SEMESTER REGULAR EXAMINATIONS
HEAT TREATMENT TECHNOLOGY
(METALLURGY & MATERIAL TECHNOLOGY)

NOVEMBER 2005

TIME: 3 HOURS
MARKS: 80

Answer any FIVE Questions
All Questions carry equal marks

MARK [5*16]

1. (a) Explain the effect of carbon content and alloying elements on properties and transformation temperatures of Martensite.
(b) Explain the Martensitic transformation by Bain distortion model.
(c) What are Athermal Martensite and Isothermal martensites.
2. (a) Critically discuss the microstructural changes during various tempering stages.
(b) What is secondary hardening? What is the effect of alloying elements on tempering.
3. Discuss the process, advantages and disadvantages of liquid carburising process.
4. (a) What do you mean by structural steels?
(b) Discuss the microstructure, heat treatment, properties and applications of any one structural steel.
5. (a) What is the effect of cooling rate on cast irons?
(b) How the white cast irons are obtained? Explain.
(c) En list properties, applications of white cast irons.
6. (a) What are ferritic - pearlitic malleable cast irons? Explain.
(b) What are black heart malleable cast irons? Explain
(c) What are white heart malleable cast irons? Explain
7. (a) What are the main industrial applications of Al-Mg and Al-Zn alloys.
(b) Write short notes on the following.
 - i. Aluminum-silicon alloys
 - ii. Duralumin.
8. (a) Write a short notes on self-lubricating bearings?
(b) What are dry and anti corrosive bearings? Explain.
(c) What are solders? Give the various types of solders. Give their applications