N	R	3	1	1	8	0	3	N	R

2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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

NOVEMBER 2005

TIME – 3 HOUR
MARK – 80

Answer any FIVE Questions
All Questions carry equal marks

1. Draw Fe-Fe3C phase diagram and label the phase fields. Discuss the different reactions that take place in this system? [16]

2. Differentiate between:

(a) Process annealing and Recrystallization annealing.

(b) Spheroidising and Diffusion annealing.

(c) Stress relieving and tempering [5+5+6]

3. (a) What is the significance of post-carburising heat treatment.

(b) What are the various methods used in general for flame hardening? Explain? [8+8]

4. (a) What is secondary hardening.

(b) What are the effects of alloying elements on tempering.

(c) Discuss the effect of alloying elements on time, temperature and transformation curves with respect to their position and shape. [5+5+6]

5. (a) With the help of Iron-Iron carbide diagram explain the cooling behavior of Hypo eutectic cast irons with 3% carbon from liquid state to room temperature.

(b) Explain the cooling behavior of eutectic cast iron with the help of ironironcarbide diagram? [8+8]

6. (a) Explain the properties and microstructure of spheroidal graphite cast irons.

(b) What are the nodulizing elements added to the ladle to get S.G.Iron? Explain its importance?

(c) Give the process sheet for the heat treatment of white cast Irons to produce malleable cast Irons. [5+5+6]

7. Write short notes on the following with respect to composition, properties, Microstructure and applications of

(a) Cupronickels

(b) Gilding metal [8+8]

8. (a) Draw lead-tin equilibrium phase diagram and label all phases in it.

(b) Explain the various physical and mechanical properties of lead?

(c) What are the important lead alloys. Explain any Two of them in detail. [5+5+6]