CODE NO: NR 211801 NR

2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

I I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS
PHYSICAL METALLURGY
(METALLURGY & MATERIAL TECHNOLOGY)

APRIL/MAY 2005

TIME 3 HOURS
MARKS: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Name various parts of scanning electron microscope and briefly explain each one of them.

(b) Briefly discuss lens materials, manufacture and applications.

2. (a) Define octahedral and tetrahedral sites and discuss with reference to BCC and FCC structures.

(b) Give an account on bonding and material property.

3. (a) What is allotropy? Discuss various allotropic forms of iron and their properties.

(b) Explain why increase of pressure may give allotropic transformation to close packed structure?

4. (a) What is a solid solution? What is an electron compound? Distinguish between solid solution and electron compound with examples.

(b) Explain with neat diagrams how the micro - structure of a pure metal may change with addition of alloying elements.

5. (a) Explain the lever rule as applied to equilibrium diagrams.

(b) "Eutectic composition usually does not show coring whereas a solid solution may show coring". Explain why.

6. (a) What is congruent melting alloy? Does eutectic alloy come under the above class?

(b) Explain miscibility gap.

(c) Discuss the coordinates of a phase diagram.

7. The Microstructure of a Fe-Fe3C alloy consists of pro-eutectiod Ferrite & Pearlite.The mass fractions of these two-constituents are 0.286 & 0.714 respectively. Determine the concentration of carbon in this alloy.

8. (a) Draw the T-T-T diagram for a eutectoid steel label the various regions & lines. Explain the effect of various elements on the position and shape of T-T-T diagram..

(b) Explain the Pearlitic & Martensitic transformation.