

CODE NO: RR 211801

2006 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

**II B.TECH I SEMESTER REGULAR EXAMINATIONS
PHYSICAL METALLURGY
(METALLURGY & MATERIAL TECHNOLOGY)**

NOVE 2006

TIME:3 HOUR
MARK:100

ANSWER ANY FIVE QUESTIONS ALL QUESTIONS CARRY EQUAL MARKS

1. Name various microscopy methods for enhancing contrast and briefly explain any three of them.
2. (a) The atomic radius of FCC Nickel is $1.243 A_0$. Calculate
 - i. The lattice parameter
 - ii. Density of nickel.(b) Calculate the packing factor for FCC of Iron.
3. (a) Give an account on Miller indices of planes with examples.
(b) Explain Miller indices of direction with examples.
4. (a) Describe Vegards Law with examples.
(b) Explain why alloy find more applications than pure metals?
(c) Explain why if one element is highly electronegative and other highly electro positive the intimate mixture of them is not an alloy?.
5. (a) Show that the homogenous nucleation barrier $\Delta G^* = 16\pi\gamma^3 / 3(\Delta G)^2$ neglecting strain energy effects.
(b) Write a short notes on super cooling.
6. (a) Distinguish between
 - i. terminal phase and
 - ii. an intermediate phase(b) Explain the differences between a congruently melting alloy and incongruently melting alloy.
7. (a) Classify copper alloys. Discuss the mechanism of increasing strength of copper alloys.
(b) Calculate the relative amounts of various phases that are present in 0.5% C steel, just above & just below the peritectic temperature.
8. (a) Differentiate between CCC & TTT diagrams.
(b) Explain about the bainitic transformation.