NAME..... ROLLNO.....

2007 JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY

B.TECH II SEMESTER INFORMATION TECHNOLOGY

PHYSICS II

DECEMBER 2007

TIME 3 HOUR
MARK 80

ANSWER ALL QUESTIONS

1. Define Entropy. What is its physical significance? Show that entropy of perfect gas remains constant for a reversible process but increases in an irreversible process.

2. Deuce Clapeyron's Latent heat equation. How does it explain the effect of pressure on the melting point of solids and boiling points of liquid?

3 A Carnot's refrigerator takes heat from water at 0'C and discard it room at 27' C. 1 Kg of water at 0' C is to be changed into ice at 0' C. How many calories of heat are discarded to the room? What is the work done by the refrigerator in this process? What is the coefficient of performance of this machine?

4 What is uncertainty principle? Use it to calculate the minimum energy of a harmonic Oscillator.

5. Derive the time dependent Schrödinger's wave equation for matter waves. What is the physical significance of wave function?

6. (a) A particle in one dimensional box is described by wave function
f(x) = (3)1/2x 0<1 = 0 else where Find probability of particle with in interval (0, 1/2)

(b) A nucleon (neutron or proton) is to confined to nucleus of radius 5 × 10 -15meters. Calculate minimum uncertainty in the momentum of the nucleon.Given m = 1.67 × 10-27kg.

7. (a) Explain in brief normalization and orthogonality conditions f or wave function.

(b) Write Maxwell's thermo dynamical relations.