Statistical Physics

Problem Set 8

1. Consider a system of N noninteracting quantum oscillators with the same angular frequency ω_0 and mass m, at temperature T. Find the partition function, entropy, and the specific heat C_V. Compare to the classical result you obtained before. Make a plot of C_V as a function of $kT/\hbar\omega$ (7pt)

2. Do the calculation needed to make a transition from Eq. (8.43) to Eqs. (8.44), (8.45) of the textbook. (8 pt)

Problems with numbers are from Kerson Huang, *Statistical Mechanics*, 2nd edition, (Wiley, NY 1987).