Physics 410 - 2004

Thermal Physics

Problem Set 7

1. Using the classical Boltzmann distribution, calculate the average kinetic energy of an atom $\langle p^2/2M \rangle$ for an ideal gas. (3 pt) Do the same for a nonideal gas, that is for the case where the Hamiltonian function has not only kinetic energy, but also potential energy of interaction between particles (4 pt)

2. Chapter 4, p. 110, problem 1 (3 pt)

3. Chapter 4, p. 110, problem 2 (5 pt)

4. Chapter 4, p. 111, problem 5 (5 pt)

5. Chapter 4, p. 111, problem 6 (5 pt)

You need to have 25 points (no extra credit points)

The problems are from Kittel & Kroemer, *Thermal Physics*, 2nd edition, (Freeman, NY 1980).