PHY410 Homework Set 8

1. [5 pts] Kittel-Kroemer, problem 6-6.

2. [10 pts] Kittel-Kroemer, problem 6-12.

3. [5 pts] Kittel-Kroemer, problem 7-2.

4. [5 pts] Kittel-Kroemer, problem 7-5. Note that ^{3}He has a complicated phase diagram at low temperatures and can even become a superfluid. The 1996 Physics Nobel Prize was awarded to Lee, Osheroff, and Richardson for their discovery of superfluidity in ^{3}He.

5. [5 pts] Kittel-Kroemer, problem 7-6.

6. [5 pts] Kittel-Kroemer, problem 7-8. Express the sought quantities in terms of N, τ and τ_E (or T and T_E). Note that Figure 7.19 shows the calculated heat capacity curve above τ_E, as well as below τ_E, where you are asked to calculate it. How would you calculate the energy, heat capacity, and entropy *above* τ_E? (Note that you are not being asked here to carry out the calculation, but just to outline that calculation.)