1. Problem 4, Chapter 2 (5 pt)

2. Consider a system of $N = 10^{10}$ spins, each with a magnetic moment $m = e\hbar/(2m_e)$ ($e$ and $m_e$ are the electron charge and mass), in a magnetic field $B = 1$ T. Assume that, as a result of interaction, each energy level $-2msB$ ($s$ is the spin excess) is split, so that the energy levels of stationary states fill the gap $2mB$ uniformly. For $s = N^{1/2}$ what is the interlevel distance? From the energy-time uncertainty relation estimate the time it will take to determine whether the system is in a stationary state (6 pt)

3. Problem 2, Chapter 2 (6 pt)

4. Problem 6, Chapter 2 (5 pt)

You need to have 20 points out of 22 (2 points are extra credit).

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