

Statistical Physics B

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1. **Exercise 1:** (Exercise 5.1 Pathria) Express the density matrix of an electron spin in the basis of $\hat{\sigma}_x$.

Hint 1 : $\hat{H} = -\mu_B B \hat{\sigma}_z$

2. **Exercise 2:** (Exercise 5.4 Pathria - an analog of the chapter 5.5) Study the density matrix and the partition function of a system of free particles using unsymmetrised wavefunction.
3. **Exercise 3:** (Exercise 6.4 Pathria)