CHEM 352: Homework for chapter 7.

1. What is the resonance frequency for ¹⁹F at 1 T field? The value for g_N for this nucleus is 5.256.

2. Proton has a nuclear spin of 1/2, which means that the degenerate nulcear spin states split into two separate states in the presence of external magnetic field. What is the difference between spin populations in the lower vs. upper nuclear spin states for protons at 1 T field and room temperature? The g_N value for proton is 5.585. Normalize your answer with respect to the total spin population.

3. What is the magnitude of magnetic field that is required for a free electron to have a resonance frequency of 9.500 GHz. For free electron $g_e \approx 2.0023$.

4. When frozen blood sample is measured with Electron Spin Resonance spectrometer (9.41756 GHz) shows a broad peak at 1629.0 Gauss. What is the *g*-value for this peak?