NMR

Preparatory questions

1. Explain the difference between continuous wave and pulsed NMR.

2. What is the spin relaxation time? Describe how it is measured with pulsed NMR. Discuss how it can be obtained with continuous wave NMR.

3. Why should the proton nuclei in different compounds behave differently in the NMR experiment ?

4. In NMR spectrometers commonly used in medicine, the resonance frequency for the protons in water is 60MHz. If such an instrument was to be used to observe ^{19}F, what frequency of Rf. radiation would be required ?

5. In a magnetic field of strength 2.349 T, the resonance frequency of ^{15}N nuclei is 10.13 MHz. What is the resonance frequency of ^{15}N in a magnet of 11.745T ?

6. The gyro-magnetic ratio of the deuterium (^{2}H) nucleus is approximately 6.5 times smaller than that of the proton (^{1}H). In a magnet where a ^{1}H spectrum can be observed at about 400 MHz, what is the approximate frequency of Rf. radiation you would need to observe the ^{2}H NMR spectrum ?