

QUIZ-4 MRI**11-1-05**

Find the energy difference ΔE between the spin up and spin down states of a proton in a magnetic field of $B = 4.0$ T. Find the resonant MRI frequency f .

($g_p = 2.793$, $\mu_N = 5.05 \times 10^{-27}$ J/T $\hbar = 6.626 \times 10^{-34}$ J-s = 4.136×10^{-15} eV-s)

$$\Delta E = \text{_____ MeV}$$

$$f = \text{_____ Hz}$$

$$\Delta E = 2 g \mu_N B = 7.04 \times 10^{-7} \text{ eV}$$

$$f = \Delta E / \hbar = 7.04 \times 10^{-7} \text{ eV} / 4.136 \times 10^{-15} \text{ eV-s} = 1.7 \times 10^8 \text{ Hz}$$