NMR

Prelab

1) The classical interpretation of spin was that particles had angular momentum due to literal spinning of the particles themselves.

2) A proton always has spin ½ - this spin can be "up" or "down" (so there are 2 spin states).

3) Magnetic moment describes the strength and direction of an objects magnetic field contribution.

4) $E = -\vec{\mu} \cdot \vec{B} = -\gamma m_I \hbar B$

For a single proton ($^1H$), $\gamma = 42.58\,[MHz/T]$

so $E_{(m=+1/2)} = -2.803 \cdot 10^{-8}\,[eV]$ ~~⟹~~

$E_{(m=+1/2)} = -2.245 \cdot 10^{-27}\,[J] = -1.401 \cdot 10^{-8}\,[eV]$

$E_{(m=-1/2)} = +2.245 \cdot 10^{-27}\,[J] = +1.401 \cdot 10^{-8}\,[eV]$

5) Magnetization can mean the process by which an object becomes magnetic (that is, starts producing a magnetic field). It can also describe the magnetic field an object exerts relative to its own position and orientation.