Magnetic Materials
Previous Year JEE Problems

3 Q. A magnetic needle of magnetic moment $6.7 \times 10^{-2} Am^2$ and moment of inertia $7.5 \times 10^{-6} kgm^2$ is performing simple harmonic oscillations in a magnetic field of 0.01 T. Time taken for 10 complete oscillations is : (1) 6.98 s (2) 8.76 s (3) 6.65 s (4) 8.89 s

[JEE(Mains) – 2017]

Sol

$$T = 2\pi\sqrt{\frac{I}{MB}}$$

$I = 7.5 \times 10^{-6}$ kg – m^2

$M = 6.7 \times 10^{-2}$ Am^2

By substituting value in the formula

T = .665 sec

for 10 oscillation, time taken will be

Time = 10 T = 6.65 sec

Answer option 3