

Test 1 - Electromagnetism (7P)

The following tasks consider a coreless coil with $N = 170$ turns, the radius $r = 0.02\text{m}$ (or $r = 2 * 10^{-2}\text{m}$) and the length $l = 0.12\text{m}$.

Calculate the Inductivity of the coil. (3P)

$$A = 2 * \pi * r^2 = 2.513 * 10^{-3}\text{m}^2 \quad (1)$$

$$L = N^2 * \mu_0 * A / l = 7.606 * 10^{-3}\text{H} \quad (2)$$

Calculate the magnetic resistance R_m of the coil. (4P)

$$R_m = l / (\mu_0 * A) = 3.8 * 10^6 \Omega \quad (3)$$