

# Test 1 - Electromagnetism (7P)

The following tasks consider a coreless coil with  $N = 100$  turns, the radius  $r = 0.02\text{m}$  (or  $r = 2 * 10^{-2}\text{m}$  and the length  $l = 0.19\text{m}$ .

**Calculate the Inductivity of the coil. (3P)**

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

$$L = N^2 * \mu_0 * A / l = 1.662 * 10^{-3}\text{H} \quad (2)$$

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

$$R_m = l / (\mu_0 * A) = 6.016 * 10^6 \Omega \quad (3)$$