

Answer on Question #59465, Physics / Electromagnetism

A 1000-turn solenoid of length 20cm has a cross-sectional area of 2.0 square centimetre.

Find the inductance of the coil if the core is air.

Find: L – ?

Given:

$$N=1000$$

$$l=0,2 \text{ m}$$

$$S=2 \times 10^{-4} \text{ m}^2$$

$$\mu=1$$

$$\mu_0=4\pi \times 10^{-7} \text{ H/m}$$

Solution:

The inductance of solenoid coil:

$$L = \frac{\mu\mu_0SN^2}{l} \quad (1)$$

$$\text{Of (1)} \Rightarrow L=1,256 \times 10^{-3} \text{ H}$$

Answer:

$$1,256 \times 10^{-3} \text{ H}$$