Answer on Question #55900, Physics / Electromagnetism

What is the self - inductance of an air-core solenoid, 1m long and 0.05m in diameter, if it has 1400 turns?

5.23mH

4.84mH

3.63mH

2.42mH

Solution

$$L = \frac{\mu_0 s N^2}{l} = \frac{1{,}26 * 10^{-6} \pi 0{,}025^2 * 1400^2}{1} = 0{,}0048 \text{ H}$$

Answer: 4.84mH

17 Which of the following is NOT correct?

A changing electric field can produce a changing magnetic field

A steady magnetic field produces a steady current

A changing magnetic field can produce a changing current

A changing magnetic field can produce a steady electric field

Solution

Answer: A changing magnetic field can produce a steady electric field

18 A rectangular coil of dimensions 20cm by 15cm lies with its plane parallel to a magnetic field of

0.5W/m2

. The coil, carrying a current of 10A experiences a torque of 4.5Nm in the field. How many loops has the coil?

100

60

30

20

Solution

$$M = \frac{a}{2}F = \frac{a}{2}BIb * 2N$$

$$N = \frac{M}{abBI} = \frac{4,5}{0,15 * 0,2 * 0,5 * 10} = 30$$

Answer: 30