ExamQUIZ 8 PHYSICS 2B SPRONG 2010

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$\mu = 4.\pi.10^{-7} = 1.26 . 10^{-6}$ N/A2

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Situation 31.1

An 18 mH solenoid inductor is wound on a form 0.80 m in length and 0.10 m in diameter. A coil is tightly wound around the solenoid at its center. The coil resistance is 5.0 ohms. The mutual inductance of the coil and solenoid is 60 µH. At a given instant, the current in the solenoid is 300 mA, and is decreasing at the rate of 2.5 A/s.

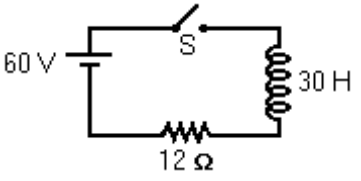
1) In Situation 31.1, at the given instant, the magnetic energy of the solenoid, in mJ, is closest to:

A) 500 B) 800 C) 600 D) 400 E) 700

2) In Situation 31.1, at the given instant, the induced current in the coil is closest to:

A) 40 µA B) 25 µA C) 30 µA D) 35 µA E) 45 µA

Figure 31.1

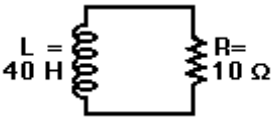


An R-L circuit has a 60 V battery, a 30 H inductor, a 12 ohm resistor, and a switch S, in series, as shown. Initially, the switch is open, and there is no magnetic flux in the inductor. At time t = 0 s, the switch is closed.

3) In Figure 31.1, when the resistor voltage is equal to the inductor voltage, the current in the circuit is closest to:

A) 2.5 A B) 1.5 A C) 1.0 A D) 2.0 A E) 3.0 A

Figure 31.2



An R-L circuit is shown, with a 10 ohm resistor and an ideal 40 H inductor, that has zero resistance. At time t = 0 s, there is a 12A current in the circuit.

4) In Figure 31.2, when the current is decreasing at the rate of 2.0 A/s, the time t is closest to:

A) 2.8 s B) 1.2 s C) 2.4 s D) 1.6 s E) 2.0 s