

Electromagnetic Induction

DPP-06

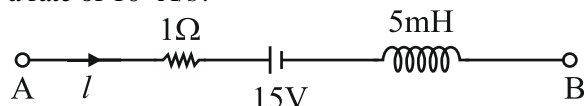
1. A coil of wire of a certain radius has 600 turns and a self-inductance of 108 mH. The self-inductance of a 2nd similar coil of 500 turns will be

(1) 74 mH (2) 75 mH
(3) 76 mH (4) 77 mH

2. A circular coil of radius 5 cm has 500 turns of a wire. The approximate value of the coefficient of self-induction of the coil will be

(1) 25 millihenry
(2) 25×10^{-3} millihenry
(3) 50×10^{-3} millihenry
(4) 50×10^{-3} henry

3. A branch of circuit is shown in the figure which is part of a complete circuit. What is the potential difference $V_B - V_A$ when the current I is 5A and is decreasing at a rate of 10^3 A/s?

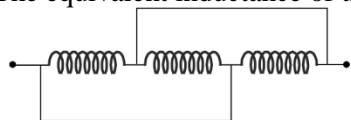


(1) 5V (2) 10V
(3) 15V (4) 20V

4. The current flowing in a coil of self inductance 0.4 mH is increased by 250 mA in 0.1 sec. The e.m.f. induced will be

(1) + 1 V (2) - 1 V
(3) + 1 mV (4) - 1 mV

5. Pure inductance of 3.0 H is connected as shown below. The equivalent inductance of the circuit is

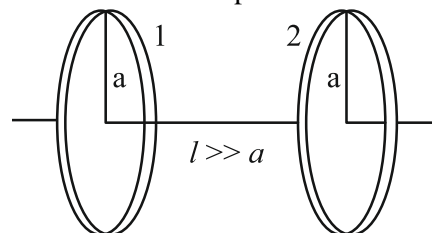


(1) 1 H (2) 2 H
(3) 3 H (4) 9 H

6. Two different coils have self inductances $L_1 = 8$ mH and $L_2 = 2$ mH. The current in both the coil is increased at same constant rate. At a certain instant power given to two coils is same. At that time the energy stored in both the coils are V_1 & V_2 respectively, then $\frac{V_1}{V_2}$ is

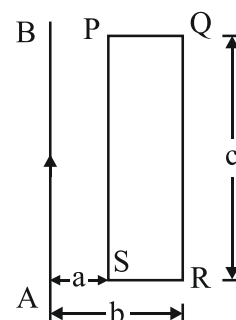
(1) $\frac{1}{4}$ (2) $\frac{1}{2}$
(3) 2 (4) 4

7. What is the mutual inductance of a two-loop system as shown with centre separation l



(1) $\frac{\mu_0 \pi a^4}{8l^3}$ (2) $\frac{\mu_0 \pi a^4}{4l^3}$
(3) $\frac{\mu_0 \pi a^4}{6l^3}$ (4) $\frac{\mu_0 \pi a^4}{2l^3}$

8. AB is an infinitely long wire placed in the plane of rectangular coil of dimensions as shown in the figure. Calculate the mutual inductance of wire AB and coil PQRS



(1) $\frac{\mu_0 b}{2\pi} \ln \frac{a}{b}$ (2) $\frac{\mu_0 c}{2\pi} \ln \frac{b}{a}$
(3) $\frac{\mu_0 abc}{2\pi(b-a)^2}$ (4) None of these

9. Two coils of self inductance L_1 and L_2 are placed closer to each other so that total flux in one coil is completely linked with other. If M is mutual inductance between them, then

(1) $M = L_1 L_2$ (2) $M = L_1 / L_2$
(3) $M = \sqrt{L_1 L_2}$ (4) $M = (L_1 L_2)^2$

10. The mutual inductance of an induction coil is 5H. In the primary coil, the current reduces from 5A to zero in 10^{-3} s. What is the induced emf in the secondary coil

(1) 2500V (2) 25000V
(3) 2510V (4) Zero

Answer Key

1. (2)
2. (1)
3. (3)
4. (4)
5. (1)
6. (1)
7. (4)
8. (2)
9. (3)
10. (2)