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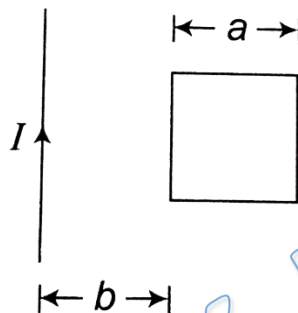Video Solution on Website:- https://physicsaholics.com/home/courseDetails/79

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Q 1. The coefficient of mutual inductance

(a) $\frac{\mu_o a}{2\pi} \ln\left(1 + \frac{a}{2b}\right)$

(b) $\frac{\mu_o a}{\pi} \ln\left(1 + \frac{b}{2a}\right)$

(c) $\frac{\mu_o a}{2\pi} \ln\left(1 + \frac{a}{b}\right)$

(d) $\frac{\mu_o a}{2\pi} \ln\left(1 + \frac{b}{a}\right)$

Q 2. Coefficient of mutual inductance of two coils is 1 H. Current in one of the coils is increased from 4A to 5 A in 1 ms. What is the magnitude of average emf induced in the other coil ?
(a) 1000 V
(b) 2000 V
(c) 100 V
(d) 200 V

Q 3. The coefficient of mutual induction between two coils is 4 H. If the current in the primary reduces from 5A to zero in 10^{-3} sec then the induced emf in the secondary coil will be
(a) 10^4V
(b) 25×10^3V
(c) 2×10^4V
(d) 15×10^3V

Q 4. When a current of 5 A flows in the primary coil then the flux linked with the secondary coil is 200 weber. The value of coefficient of mutual induction will be
(a) 1000 H
(b) 40 H
(c) 195 H
(d) 205 H

Q 5. The coefficient of mutual inductance of two circuits A and B is 3 mH and their respective resistances are 10Ω and 4Ω. How much current should change in 0.02 s in circuit A, so that the induced current in B should be 0.0060A?
(a) 0.24A
(b) 1.6 A
(c) 0.18 A
(d) 0.16 A

Q 6.   Two coil A and B have coefficient of mutual inductance M=2H. The magnetic flux passing through coil A changes by 4 Weber in 10 seconds due to the change in current in B. Then
(a) change in current in B in this time interval is 0.5A
(b) change in current in B in this time interval is 2A
(c) change in current in B in this time interval is 8A
(d) a change in current of 1A in coil A will produce a change in flux passing through B by 4 weber.

Q 7.   Two coils X and Y are placed in a circuit such that when the current changes by 2 A in coil X. The magnetic flux changes by 0.4 Wb in Y. The value of mutual inductance of the coils is
(a) 0.2 H   (b) 5 H
(c) 0.8 H   (d) 4 H

Q 8.   The mutual inductance between a primary and secondary circuits is 0.5 H. The resistances of the primary and the secondary circuits are 20 ohms and 5 ohms respectively. To generate a current of 0.4 A in the secondary, current in the primary must be changed at the rate of
(a) 4.0 A/s   (b) 16.0 A/s
(c) 1.6 A/s   (d) 8.0 A/s

Q 9.   What is the mutual inductance of a two-loop system as shown with center separation l?

(a) $\frac{\mu_o \pi a^4}{8l^3}$ (b) $\frac{\mu_o \pi a^4}{4l^3}$
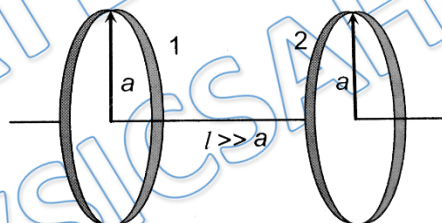
(c) $\frac{\mu_o \pi a^4}{6l^3}$ (d) $\frac{\mu_o \pi a^4}{2l^3}$

Q 10.   Two coils have a mutual inductance 0.005H. The current changes in the first coil according to equation $I = I_o \sin(\omega t)$, where $I_o = 10A$ and $\omega = 100\pi$ rad/sec. The max. value of e.m.f. in second coil is
(a) 2π (b) 5π
(c) π (d) 4π

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Answer Key

Q.1 c	Q.2 a	Q.3 c	Q.4 b	Q.5 d
Q.6 b	Q.7 a	Q.8 a	Q.9 d	Q.10 b