Physicsaholics

DPP – 4 (EMI)

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

Video Solution on YouTube:- https://youtu.be/ggMttZ_Ai3c

Written Solution on Website:- https://physicsaholics.com/note/notesDetalis/61

Q 1. An e.m.f. of 5 volt is produced by a self inductance, when the current changes at a steady rate from 3 A to 2 A in 1 millisecond. The value of self inductance is
(a) Zero (b) 5 H
(c) 5000 H (d) 5 mH

Q 2. An average emf of 25 V is induced in an inductor when the current in it is changed from 2.5 A in one direction ot the same value in the opposite direction in 0.1s. Find the self-inductance of the inductor.
(a) 0.5 H (b) 1 H
(c) 5H (d) 50 mH

Q 3. The current in ampere through an inductor is I = (10+20t). Here t is in second. The induced emf in the inductor 4V. The self inductance of the inductor is, L= …..H
(a) 2 (b) 20
(c) 0.2 (d) 0.02

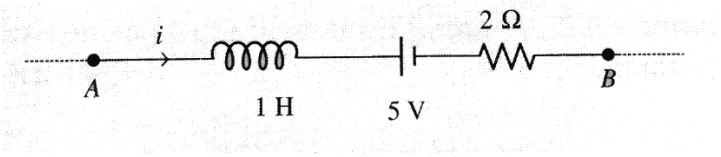
Q 4. In an inductor of inductance L = 100 mH, a current of I = 10 A flowing. The energy stored in the inductor is
(a) 5 J (b) 10 J
(c) 100 J (d) 1000 J

Q 5. The magnetic potential energy stored in a certain inductor is 25 mJ, when the current in the inductor is 60 mA . This inductor is of inductance
(a) 13.89 H (b) 0.138 H
(c) 1.389 H (d) 138.8 H

Q 6. In what form is the energy stored in an inductor of A coil of inductance L is carrying a steady current i. What is the nature of its stored energy
(a) Magnetic (b) Electrical
(c) Both magnetic and electrical (d) Heat

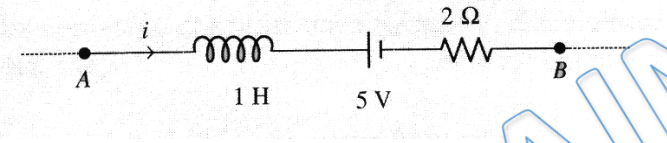
Q 7. A coil of self-inductance 50 henry is joined to the terminals of a battery of e.m.f. 2 volts through a resistance of 10 ohm and a steady current is flowing through the circuit. If the battery is now disconnected, the time in which the current will decay to 1/e of its steady value is
(a) 500 seconds (b) 50 seconds
(c) 5 seconds (d) 0.5 seconds

Q 8. AB is a part of circuit. Find the potential difference $V_A - V_B$ if current I = 2A and is constant



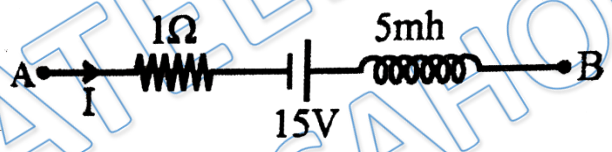
(a) 9V (b) 10 V
(c) 8V (d) zero

Q 9. AB is a part of circuit. Find the potential difference $V_A - V_B$ if
(a) current I = 2A and is increasing at the rate of 1 A/s
(b) current I = 2A and is decreasing at the rate of 1 A/s



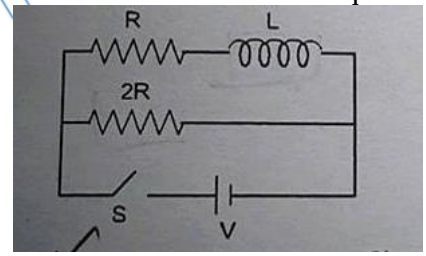
(a) 8V, 9V (b) 8V, 6V
(c) 9V, 8V (d) 10V, 8V

Q 10. If I = 5A and decreasing at a rate of 10^3 A/sec, then potential difference $V_B - V_A$ will be



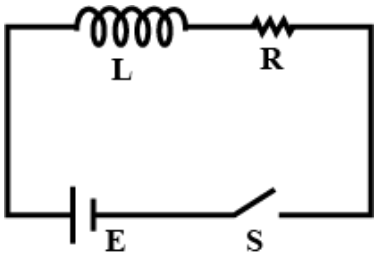
(a) 5V (b) 10V
(c) 15V (d) 20V

Q 11. Consider a L-R circuit shown in figure. There is no current in circuit switch S is closed at t = 0, time instant when current in inductor is equal to current in resistor 2R will be:



(a) $\frac{L}{R}\ln 2$ (b) $\frac{2L}{R}\ln 2$
(c) $\frac{L}{2R}\ln 2$ (d) $\frac{L}{2R}$

Q 12. In the circuit shown in figure switch S is closed at time t = 0. The charge which passes through the battery in one time constant is



(a) $\frac{eR^2E}{L}$ (b) $E\left(\frac{L}{R}\right)$

(c) $\frac{EL}{eR^2}$ (d) $\frac{eL}{ER}$

Answer Key

Q.1 d	**Q.2 a**	**Q.3 c**	**Q.4 a**	**Q.5 a**
Q.6 a	**Q.7 c**	**Q.8 a**	**Q.9 d**	**Q.10 c**
Q.11 a	**Q.12 c**			