Lakshya JEE (2024)

Electromagnetic Induction

DPP-08

1. The time constant of L – R circuit is doubled if_____.

(1) Both L and R become two times
(2) L becomes four times and R becomes two times
(3) L becomes two times and R becomes four times
(4) L becomes two times and R becomes eight times

2. A solenoid of resistance 50Ω and inductance 80 Henry is connected to a 200 V battery. How long will the current take to reach 50% of its final equilibrium value?

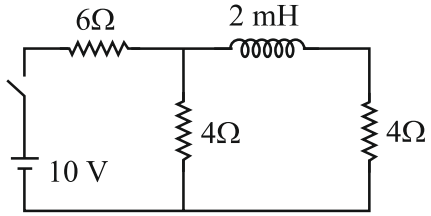
(1) 1.109 sec.
(2) 1 sec.
(3) 2 sec.
(4) 1.5 sec.

3. In an LR circuit current at t = 0 is 20 A. After 2s it reduces to 18 A. The time constant of the circuit is (in second) _____.

(1) $\ln\left(\frac{10}{9}\right)$ (2) 2

(3) $\frac{2}{\ln\left(\frac{10}{9}\right)}$ (4) $2\ln\left(\frac{10}{9}\right)$

4. In the given circuit find the ratio of i_1 to i_2. Where i_1 is the initial (at $t = 0$) current, and i_2 is steady state (at $t = \infty$) current through the battery _____.

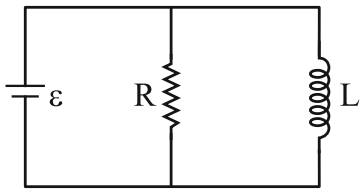


(1) 1.0 (2) 0.8
(3) 1.2 (4) 1.5

5. In a series $L - R$ growth circuit, if maximum current and maximum induced emf in an inductor of inductance 3mH are 2A and 6V respectively, then the time constant of the circuit is _____.

(1) 1 ms
(2) 1/3 ms
(3) 1/6 ms
(4) 1/2 ms

6. The battery shown in the figure is ideal. The values are ε = 10 V, R = 5Ω, L = 2H. Initially the current in the inductor is zero. The current through the battery at t = 2s is _____.



(C) 3 A

(1) 12 A (2) 7 A
(3) 3 A (4) None of these

7. An ideal coil of 10 H is joined in series with a resistance of 5Ω and a battery of 5 V. 2s after joining, the current flowing in ampere in the circuit will be _____.

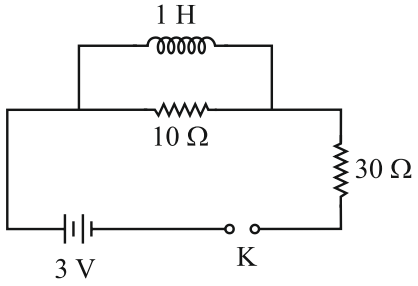
(1) e^{-1}
(2) $(1 - e^{-1})$
(3) $(1 - e)$
(4) e

8. An L-R circuit has a cell of emf E, which is switched on at time $t = 0$. The current in the circuit after a long time will be _____.

(1) Zero (2) $\frac{E}{R}$

(3) $\frac{E}{L}$ (4) $\frac{E}{\sqrt{L^2 + R^2}}$

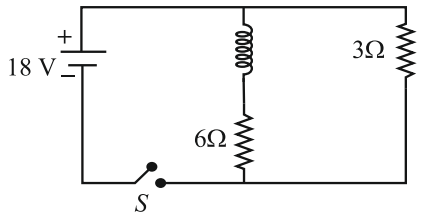
9. In figure, final value of current in 10Ω resistor, when plug of key *K* is inserted is _____.



(1) $\frac{3}{10}A$ (2) $\frac{3}{20}A$

(3) $\frac{3}{11}A$ (4) zero

10. In the following circuit the value of current *i* through the battery just after the switch *S* is closed is



(1) 3 A (2) 6 A

(3) 2 A (4) 9 A

Note: Kindly find the Video Solution of DPPs Questions in the DPPs Section.

Answer Key

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