25. Let C be the capacitance of a capacitor discharging through a resistor R. Suppose t_1 is the time taken for the energy stored in the capacitor to reduce to half its initial value and t_2 is the time taken for the charge to reduce to one-fourth its initial value. Then, the ratio t_1/t_2 will be :

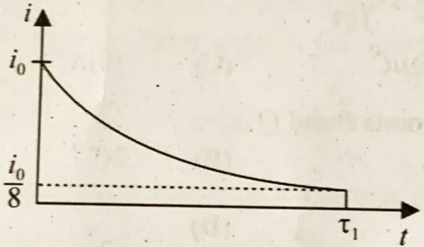
(A) 1 (B) 1/2 (C) 1/4 (D) 2

34. A charged capacitor C with initial charge q_0 is connected to a coil of self inductance L at $t = 0$. The time at which the energy is stored equally between the electric and the magnetic fields is:

(A) $\frac{\pi}{4}\sqrt{LC}$ (B) $2\pi\sqrt{LC}$ (C) $\sqrt{LC}$ (D) $\pi\sqrt{LC}$

V $R_2 = 4\Omega$

39. A charged capacitor is allowed to discharge. The current flowing in the circuit is plotted against time as shown. The time instant when the current is $\frac{i_0}{16}$ is $t = \tau_2$. Then $\frac{\tau_2 + \tau_1}{\tau_2 - \tau_1} =$ ________.



40. Three identical ...

43. The two plates of a parallel plate capacitor of capacitance C are given charge $+\frac{Q}{3}$ and $+\frac{2Q}{3}$. The potential difference between the plates becomes V. Then, $\frac{Q}{CV} =$ ________.

46. Two capacitors of capacitance C and $2C$ are charged to the same potential. Let the total potential energy stored in the capacitors be U_i. The capacitors are now connected in series such that plates carrying opposite charge are connected to each other. After the current has become zero, the total potential energy stored in both capacitors is U_f. Then, $10\left(\frac{U_i}{U_f}\right) =$ ________.

47. A capacitor charged to a potential V has potential energy U. It is connected in series with a resistance and discharged. Until the time the potential across the capacitor reduces to $\frac{V}{N}$, the heat dissipated in the resistance is $H = \frac{15}{16}U$. Then, $N =$ ________.