

PYQ [IIT-JAM]

(Chapter 1 Kirchhoff's Law)

- Q1. A battery with a constant emf ε and internal resistance r_i provides power to an external circuit with a load resistance made up by combining resistance R_L and $2R_L$ in parallel. For what value of R_L will the power delivered to the load be maximum?

(a) $R_L = \frac{r_i}{4}$ (b) $R_L = \frac{r_i}{2}$ (c) $R_L = \frac{2}{3}r_i$ (d) $R_L = \frac{3}{2}r_i$

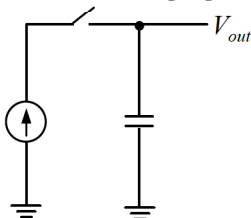
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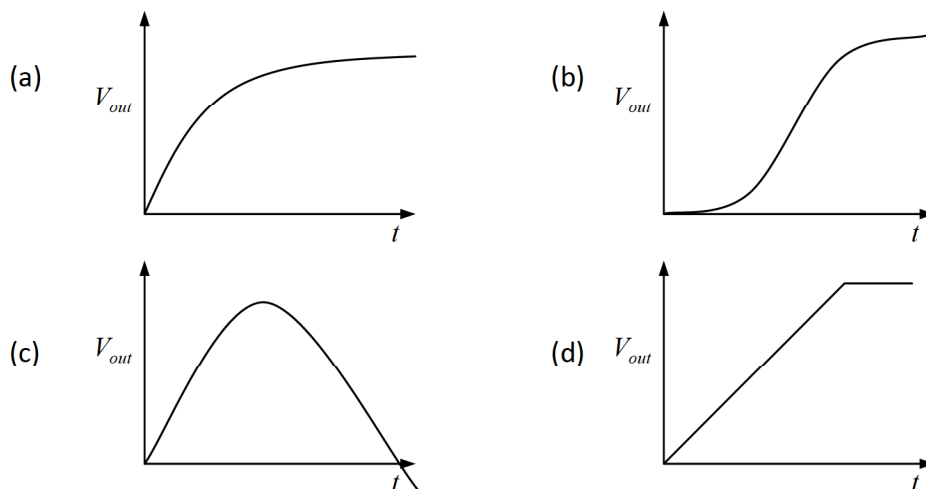
- Q1. For a given load resistance $R_L = 4.7 \text{ ohm}$, the power transfer efficiencies $\left(\eta = \frac{P_{load}}{P_{total}}\right)$ of a dc voltage source and a dc current source with internal resistances R_1 and R_2 , respectively, are equal. The product $R_1 R_2$ in units of ohm^2 (rounded off to one decimal place) is _____

GATE-2019

- Q2. The figure shows a constant current source charging a capacitor that is initially uncharged.



If the switch is closed at $t = 0$, which of the following plots depicts correctly the output voltage of the circuit as a function of time?



GATE-2010