Assignment 5

Due on 2020-03-04, 23:59 IST.

1. The energy stored in the MOSFET capacitor when charging the load capacitance depends on the frequency. Without energy stored in the capacitor, the voltage across the load is zero. If the voltage across the load is 30V and the input voltage is 50V, then the energy stored in the capacitor is 0.75 Joules.

2. A current mirror with a gain of 10 and a supply voltage of 5V dissipates 100mW of power. The frequency of the circuit is increased to 1GHz, in order to keep the power dissipation constant, the supply voltage must be multiplied. The answer must be in the form of a calculation: V_supply = ?

3. The energy stored in the inductor L when charging the load capacitance depends on the frequency. Without energy stored in the inductor, the voltage across the load is zero. If the voltage across the load is 30V and the input voltage is 50V, then the energy stored in the inductor is 0.75 Joules.

4. A current mirror with a gain of 10 and a supply voltage of 5V dissipates 100mW of power. The frequency of the circuit is increased to 1GHz, in order to keep the power dissipation constant, the supply voltage must be multiplied. The answer must be in the form of a calculation: V_supply = ?

5. A signal with an amplitude of 5V is applied to a resistor R. The power dissipated in the resistor is 25W. The answer must be in the form of a calculation: R = ?

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10. A signal with an amplitude of 5V is applied to a resistor R. The power dissipated in the resistor is 25W. The answer must be in the form of a calculation: R = ?

11. An inverter made of long channel devices is designed to have a trip point Vt = VDD - VTH. Which of the following statements are true? (Isolated statement)

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