Assignment 5

The due date for submitting this assignment has passed. As per our records, you have not submitted this assignment.

1. The channel length of a MOSFET should be _____ to minimize the 1/f noise power of the amplifier:
   a. Large
   b. Small
   c. Medium
   d. Any
   Answer: b

2. In the circuit of Fig. 2, we wish to achieve a 0.1 dB bandwidth of 1 GHz with a load capacitance of 2 pF. What is the maximum (low-frequency) gain that can be achieved with a given distortion characteristic of 1%? Answer: G0 = 0.1 V/V and neglect the effect of the input and other capacitances. Assume Thermal Voltage, Vth = 26 mV and also write the sign for the gain.

3. The zero arising in a 2-stage OPAMP due to compensation capacitor makes the phase more _____ and decreases the magnitude of the gain:
   a. increases
   b. decreases
   c. remains the same
   d. It does not change
   Answer: a

4. The zero arising due to Cc can be nullified by inserting a _______ in series:
   a. common drain
   b. common source
   c. common gate
   d. commons
   Answer: b

5. There is no benefit of increasing chopping frequency beyond twice the corner frequency:
   a. True
   b. False
   Answer: b

6. For an inverting phase- shift, which of the following would hold true?
   a. $\Gamma_{in} = \Gamma_{out}$
   b. $\Gamma_{in} = \Gamma_{out}$
   c. $\Gamma_{in} = \Gamma_{out}$
   d. $\Gamma_{in} = \Gamma_{out}$
   Answer: a

Common Data for Question 7 & 8
A particular small-signal gain BTF has f0 of 500 MHz and $C_{ox} = 0.01 \text{ pF}$ when operated at $V_{dd} = 1.0 \text{ V}$. What is $C_{ox}$ in this situation in fF? Assume Thermal Voltage, $V_{th} = 26 \text{ mV}$

7. Also, find $g_{0}$ in this situation in mA/V?

8. A particular small-signal BTF has f0 of 200 MHz and $C_{ox} = 0.01 \text{ pF}$ when operated at $V_{dd} = 1.0 \text{ V}$. What is $C_{ox}$ in this situation in fF? Assume Thermal Voltage, $V_{th} = 26 \text{ mV}$

9. Does charge stabilization help mitigating thermal noise?
   a. Yes
   b. No
   c. I do not know
   Answer: a

1.0 point

1.0 point

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