Quiz for Lesson 25 and 26

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<u>Prob. 1</u>

Sketch how an n-type MOSFET look like. Clearly identify gate, source, drain terminals in your sketch.

<u>Prob. 2</u>

We learned earlier that current conduction in semiconductors is done by diffusion and/or drift of carriers. Which of these two contributes to the source-drain current in MOSFET?

Prob. 3

What is the channel charge density (C/length) at the source side and the drain side of an n-type MOSFET? Give your answers in terms of W (channel width), C_{ox} (capacitance per unit area), V_{GS} , V_{DS} , and V_{TH} .

<u>Prob. 4</u>

Plot I_D 's vs V_{DS} for an n-type MOSFET when V_{GS} > V_{TH} . Include I_D 's for two different values of V_{GS} 's. Clearly indicate different regions of MOSFET operation.

<u>Prob. 5</u>

An electrical switch can be realized with a MOSFET. Give the conditions for making the switch on and off. Assume the voltage across the switch is very small. What is the resistance when the switch is on?

<u>Prob. 6</u>

Determine the minimum value of V_{DD} with which the MOSFET is in saturation in the circuit shown below. Use $\mu_n C_{ox} = 200 \text{mA}/V^2$ and $V_{TH} = 0.4V$.

$$R_{D} \gtrless 500 \Omega$$

$$1 \bigvee + \frac{+}{+} = \frac{10}{0.18}$$