# Fundamentals of Nanotransistors

## L1.2 Quiz

**ANSWERS**

Mark Lundstrom
Purdue University

**Lecture 1.2: The MOSFET as a Black Box**

1) Which of the following is the **transfer characteristic** of a MOSFET?

**a)** $I_{DS}$ vs. $V_{GS}$ at a constant $V_{DS}$

b) $I_{DS}$ vs. $V_{DS}$ at a constant $V_{GS}$

c) $I_G$ vs. $V_{GS}$ at a constant $V_{DS}$

d) $I_G$ vs. $V_{DS}$ at a constant $V_{GS}$

e) $V_{DS}$ vs. $V_{GS}$ at a constant $I_{DS}$

2) Which of the following is the **output characteristic** of a MOSFET?

a) $I_{DS}$ vs. $V_{GS}$ at a constant $V_{DS}$

**b)** $I_{DS}$ vs. $V_{DS}$ at a constant $V_{GS}$

c) $I_G$ vs. $V_{GS}$ at a constant $V_{DS}$

d) $I_G$ vs. $V_{DS}$ at a constant $V_{GS}$

e) $V_{DS}$ vs. $V_{GS}$ at a constant $I_{DS}$

3) Which bias region below corresponds to the **saturation region** of a P-MOSFET operating "above threshold"?

a) $V_{DS} > V_{GS},\ V_{GS} > V_T$

b) $V_{DS} < V_{GS}, V_{GS} > V_T$

c) $V_{DS} > V_{DSAT}, V_{GS} > V_T$

d) $V_{DS} > V_{DSAT}, V_{GS} < V_T$

**e)** $V_{DS} < V_{DSAT}, V_{GS} < V_T$