

## Fundamentals of Nanotransistors

### L4.8 Quiz

#### ANSWERS

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### Lecture 4.8: Limits and Limitations

1) What is the minimum switching energy of a MOSFET?

- a)  $k_B T$ .
- b)  $(3/2)k_B T$ .
- c)  $k_B T/2$ .
- d)  $k_B T \ln 2$ .**
- e)  $k_B T/q$ .

2) What sets the fundamental lower limit to the channel length?

- a) 2D electrostatics.
- b) Parasitic gate capacitance.
- c) Band-to-band quantum tunneling.
- d) Intra-band quantum tunneling.**
- e) Avalanche breakdown.

3) In practice, what determines the switching energy?

- a) The intrinsic gate capacitance.
- b) The parasitic gate capacitance.
- c) The power supply voltage.
- d) All of the above.**
- e) None of the above.