

UM-SJTU JI Summer 2019 VE 320 Quiz 10

Name:

Student ID:

1. (a) Why is there subthreshold conduction? Please draw the band diagram and explain. (b) What is the lower limit of the subthreshold swing for MOSFETs?

2. An n-channel MOSFET with a substrate doping concentration of $N_a = 2 \times 10^{16} \text{ cm}^{-3}$, a threshold voltage of $V_T = 0.4 \text{ V}$. The transistor is biased at $V_{GS} = 0.8 \text{ V}$ and $V_{DS} = 2.5 \text{ V}$. Find the minimum channel length such that the ratio of actual drain current to the ideal drain current due to channel length modulation is no larger than 1.35.