Review Questions

1. What is the difference between a source and a drain of a MOSFET?
2. What is the difference between an n-type and a p-type MOSFET?
3. What is the difference between an enhancement and a depletion MOSFET?
4. Which device has most positive threshold voltage a depletion mode p-type MOSFET or an enhancement mode p-type MOSFET?
5. Which device has the highest drain current in saturation at zero gate voltage, a p-type enhancement MOSFET or an n-type depletion MOSFET?
6. Why is the electron layer of an n-MOSFET called an inversion layer?
7. Why is there no current in a MOSFET when the device is biased in accumulation?
8. What is the difference between the linear and the quadratic MOSFET model?
9. Does the body effect affect CMOS circuits? Explain.
10. How does the oxide thickness and substrate doping affect the threshold voltage of a MOSFET. Plot the threshold voltage as a function of the oxide thickness for different doping densities.
11. What is the advantage of a poly-silicon gate technology?
12. What is channel length modulation?
13. What is punchthrough?
14. Explain the effect of scaling on the different MOSFET parameters as listed in Table 7.7.1