Homework #4

Date: October 22, 2012

Due: October 29, 2012; No late work accepted;

TA:李哲   Email: justinian@sjtu.edu.cn or lizhe@ic.sjtu.edu.cn

➢ Use A4 paper to write/print your answer.

➢ Your name and student ID on the cover page.

➢ Staple the pages!!!

1. **In the circuit shown below, assume $g_{m1} = g_{m2} = g_{m3} = (200\Omega)^{-1}$**
   a) **What is the minimum value of R_D that ensures oscillation?**
   b) **Determine the value of C_L for an oscillation frequency of 1GHz and a total low-frequency loop gain of 16.**
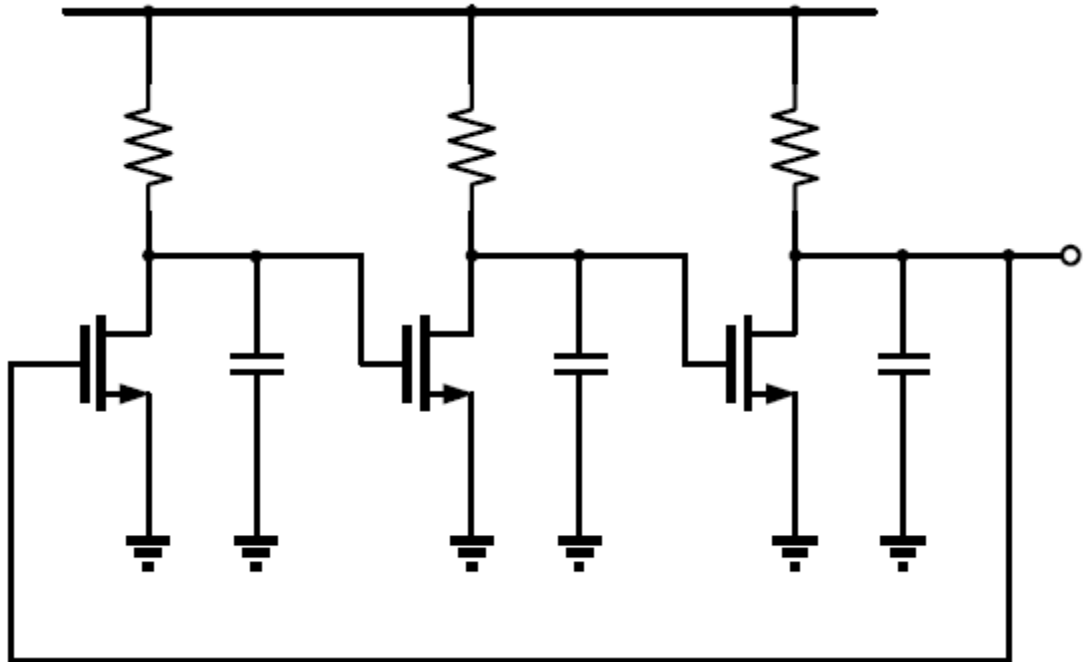
2. **With the oscillator shown below.**

   a) **Assume the voltage swing is large enough to turn MOSFETs on or off suddenly, then drain current of MOSFETs works in a square manner. Explain why output waveforms are closer to sinusoids.**

   b) **If Lp=5nH and the total (fixed) parasitic capacitance seen at X (and Y) to ground is 500fF, determine the maximum capacitance than D1 and D2 can add to the circuit.**