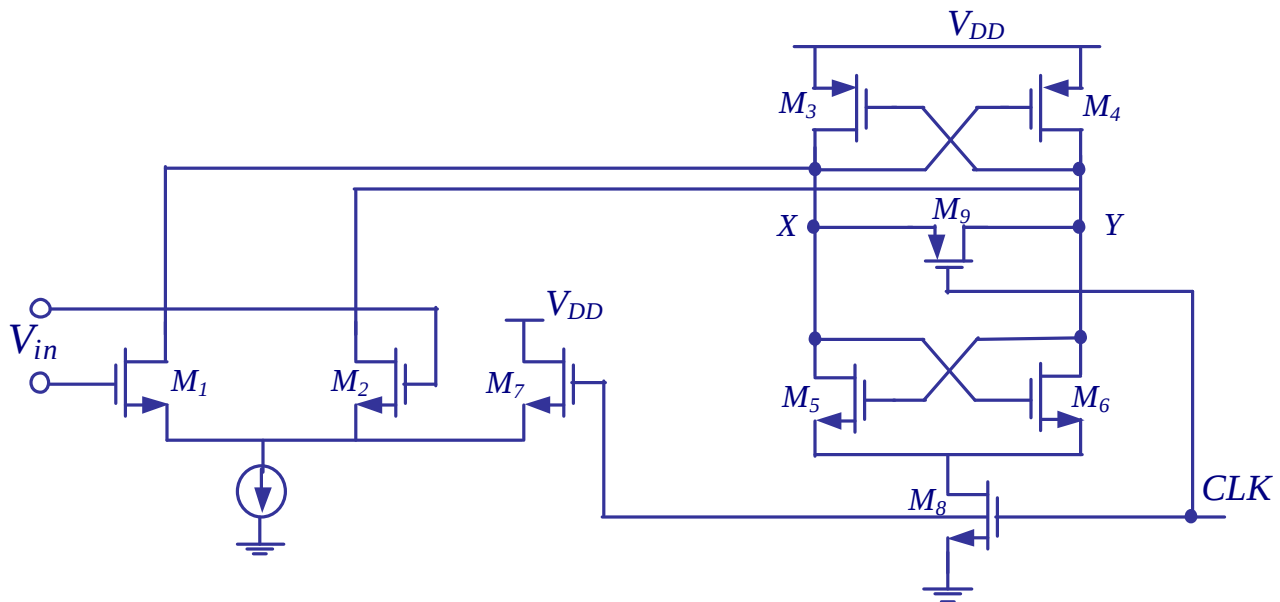


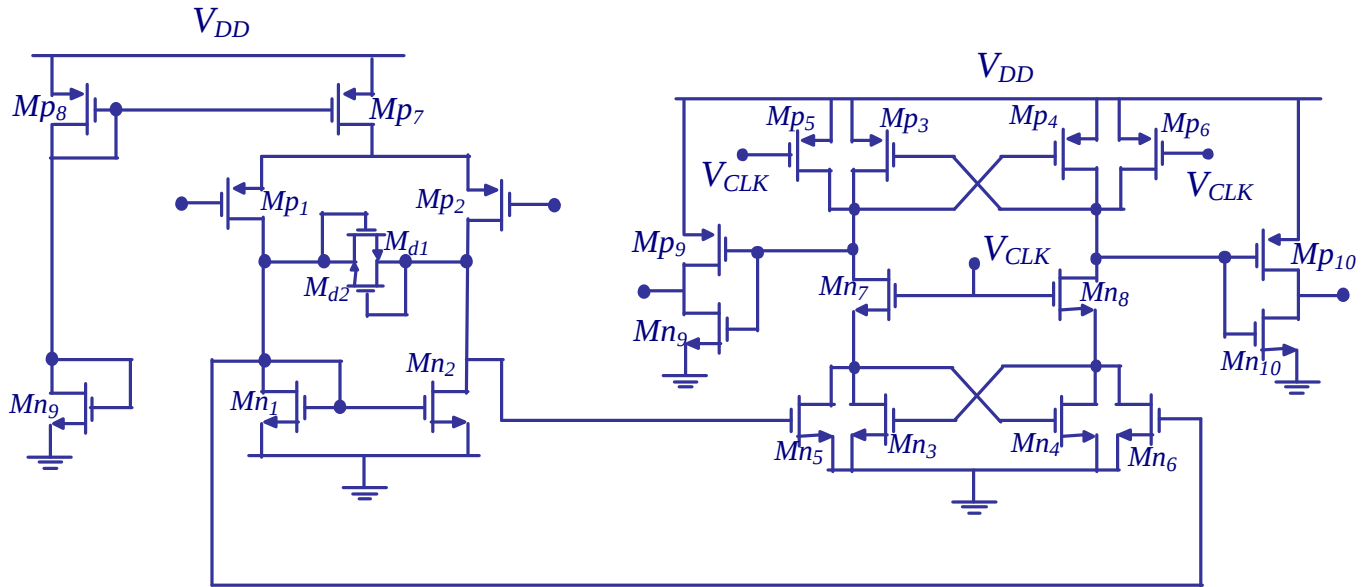
Homework 2
ECE210B: Advanced Analog IC Design, II
 Payam Heydari
 Due date: Monday, Jan. 28, 2001

1. Consider the following clocked comparator:



- Describe the circuit operation. What does each transistor do in the circuit?
- What is the purpose of using M_9 ?
- What is the gain of the circuit in tracking (reset) mode?
- Calculate the input referred thermal noise sources?

2. Consider the following clocked comparator:



- Describe the detailed operation of the comparator. Specify the operation role of each transistor in the circuit.
- Use the following 0.35 μ m MOS spice parameters that has been provided by MOSIS, and answer the following questions:

http://www.mosis.org/cgi-bin/cgiwrap/umosis/swp/params/tsmc-035/t14a_2p4m-params.txt

- i. Using HSPICE or Cadence simulation, obtain the response of this comparator for a clock input of 500MHz. Choose the (W/L) ratios appropriately such that you can obtain a nice comparator operation at this frequency. (Clearly there is not a unique set of values for the transistor sizes). Use different arbitrary non-inverting inputs for the operation test. The inverting input is at the DC voltage of 1.65V.