VLSI Design

CMOS Inverter

C CMOS Inverter

- Series connection of nmos and pmos
- DC characteristics
- Solving $V_{inn}=V_{inp}$ and $I_{dsn}=I_{dsp}$
- Regions of operations – 5
  - $0<V_{in}<V_{tn}$,
  - $V_{in} = V_{DD/2}$
  - $V_{in}>V_{in}-V_{DD}$,
  - $-V_{tn}<V_{in}<V_{DD/2}$,
  - $-V_{DD/2}<V_{in}<V_{DD}+V_{tp}$,

C CMOS Inverter

- β_n/β_p ratio effect
- Noise margin
  - Allowable noise at i/p
  - o/p should not get affected
- Inverter as an Amplifier
  - Formula

Static load inverters

- Many other forms
- Resistor – transistor in linear region
- Current source – in saturation region
- Pseudo nMOS inverter
- Saturated load inverters
  - NMOS
  - PMOS