

Indian Institute of Technology, Delhi
EEL 204: Analog Electronic Circuits
Tutorial 4, February 17, 2011

For the nMOSFETS, assume the following I_D characteristics:

$$I_D = K(V_{GS} - V_T)^2$$

where K is 10 mS/V, and the V_T of the device is 0.5 V. The MOSFET remains in saturation as long as $V_{DS} > V_{GS} - V_T$. Adapt these characteristics for pMOS devices as well. Assume r_{ds} is such that $g_m r_{ds}$ of any given MOS device is 20.

For the BJTs, β is 100, η is 1. Assume r_o of each BJT is 50 k Ω .

Find the following for each of the structures:

1. Bias conditions, output current.
2. Range of voltages at the load for which the structure behaves like a current source.
3. Power consumption.
4. Output resistance.

