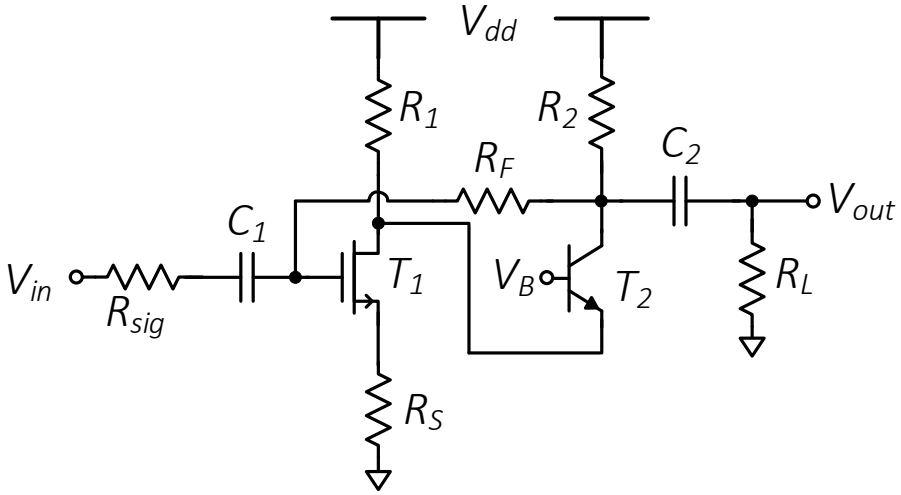
EHB 335E Midterm – Group A (ITU ID Last digits 0, 1, and 6 only)

10 December 2020

2) In the amplifier below, $C_1 = 10\ \mu F$ and $C_2 = 0.1\ \mu F$ are coupling capacitors. Consider $g_{m1} = 10\ mS$, $g_{m2} = 2\ mS$, $R_F = 50\ k\Omega$, $R_{sig} = 150\ \Omega$, $R_S = 100\ \Omega$, $R_1 = 1k\Omega$, and $R_2 = R_L = 40k\Omega$. Assume $V_A = \infty$ and $\lambda = 0$. You can write the voltage gain expressions by properly indicating to what they correspond.



a) Find the lower corner frequency (–3 dB) expression of the cascaded amplifier by first applying the Miller Effect followed by the short-circuit time constants method.
b) If an ideal (zero rise time) periodic pulse with an on-time of $T_D = 1\ ms$ is applied at the input of the amplifier, find the tilt observed in the output signal.