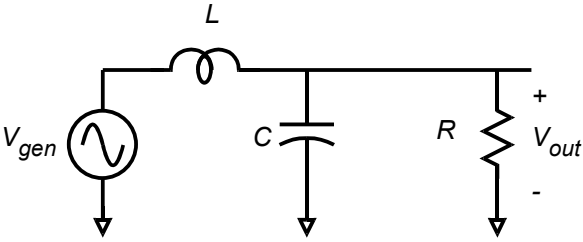
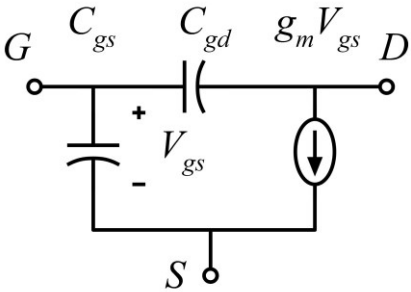
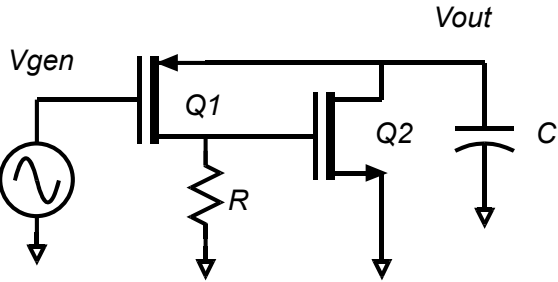


ECE137B PS#2

	<p>Problem 1</p> <p>(a) Compute the transfer function, with the answer either fully factored in terms of poles and zeros, or given in dimensionless ratio-of-polynomials form:</p> $Ks^m \frac{1 + a_1s + a_2s^2 + \dots}{1 + b_1s + b_2s^2 + \dots}$ <p>(b) $R=100$ Ohms. The natural resonant frequency f_n is 1 GHz and the damping factor ζ is 0.2. Find the values of L and C</p> <p>(c) Accurately plot the Magnitude and phase of the frequency response in Bode Form on semilog paper. (d) Accurately plot the root locus, indicating the pole and zero locations accurately. (e) Compute and plot $V_{out}(t)$ for $V_{in}(t)=1\text{Volts} \cdot U(t)$.</p>
	<p>The problem below will use the MOSFET equivalent circuit to the left.</p>
	<p>Problem 2: This circuit is called a super-buffer. Ignore DC bias; you don't need it.</p> <p>Q1: $C_{gs} = C_{gd} = 0$. $R_{ds} = \text{infinity}$.</p> <p>Q2: $C_{gs} = 100$ fF, $C_{gd} = 0$. $R_{ds} = \text{infinity}$</p> <p>(a) Compute by nodal analysis the small signal transfer function V_{out}/V_{gen} (b) , $g_{m1} = 10\text{mS}$, $g_{m2} = 20$ mS, $R = 500$ Ohm, $C = 1$ pF Find the damping factor ζ and the resulting natural resonant frequency f_n. (c) Plot an accurate root locus. (d) Accurately plot the Magnitude of the frequency response in Bode Form on semilog paper.</p>