ECE 336, spring 2024, Homework #8, **Due: April 10, 2024**

1.) Determine **H**(ω) = **V**o(ω)/**V**i(ω) and sketch the asymptotic Bode magnitude plot for the circuit shown in Figure 1.

Figure 1

2.) Determine **H**(ω) = **V**o(ω)/**V**i(ω) and sketch the asymptotic Bode magnitude plot for the circuit shown in Figure 2.

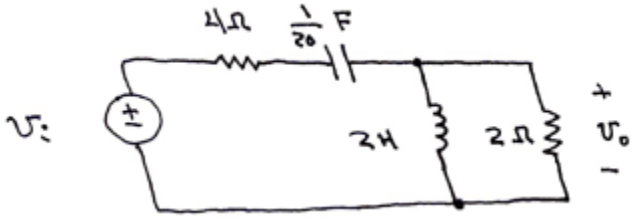

Figure 2

3.) Determine **H**(ω) = **V**o(ω)/**V**i(ω) and sketch the asymptotic Bode magnitude plot for the circuit shown in Figure 3.

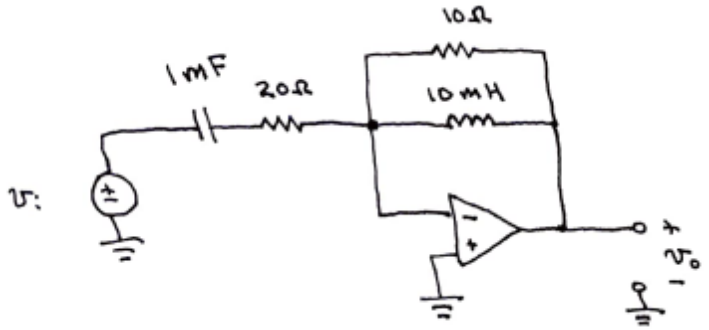

Figure 3

4.) (a) Sketch the asymptotic Bode magnitude plot for a circuit with network function
$\mathbf{H}(\omega) = \frac{12000000j\omega}{(j\omega+300)(j\omega+4000)}$.
(b) Plot the exact Bode magnitude plot using Matlab

5.) (a) Sketch the asymptotic Bode magnitude plot for a circuit with network function
$\mathbf{H}(\omega) = \frac{1600000(j\omega+400)(j\omega+8000)}{(j\omega+20)(j\omega^2+j\omega+100000)}$.
(b) Plot the exact Bode magnitude plot using Matlab

6.) Determine the maximum value of | **H**(ω)|, the resonant frequency, the bandwidth, and the quality factor for the parallel resonant circuit shown in Figure 4. Sketch the asymptotic Bode magnitude plot.

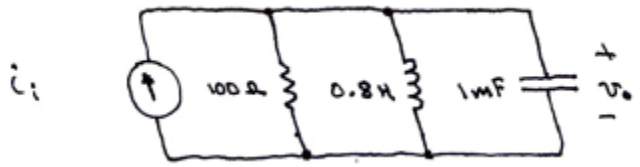

Figure 4

7.) Design the series resonant circuit shown in Figure 5 to have the network function $\boldsymbol{H}(\omega) = \frac{j\omega/3}{(j\omega)^2+2j\omega+101}$. Sketch the asymptotic Bode magnitude plot. Determine the resonant frequency, the bandwidth, and the quality factor for the circuit.

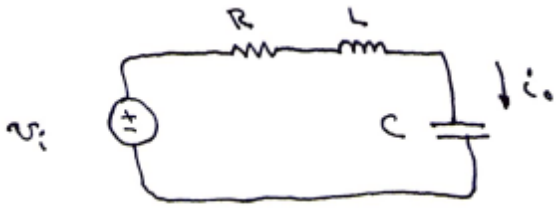

Figure 5