1. Given $V_g=10\text{mV}$, find $V_o$. Find the Thevenin equivalent between terminals a-b. (Note: $v_1 \neq V_g$)

![Circuit Diagram]

2. Sketch the following waveforms. Identify the dc component of the waveform and the ac component of the waveform.
   
   a. $V_s=10\cos(10t)\text{ V}$
   
   b. $V_s=3\text{ V} +7\cos(10t)\text{ V}$
   
   c. $V_s=3\text{ V} \pm 0.25\text{V}$

3. Explain in your own words the procedural steps for plotting Bode Plots. (Note: I would prepare this question for use during an exam)

4. (a) Plug in values of $\omega$ from $0.1$ to $10^5\text{ rad/sec}$. Plot this graph of Volts vs $\omega$.
   
   (b) Sketch the Bode plots using a straight-line approximation (procedures described in class)
   
   (c) Use Matlab to obtain the Bode Plot.
   
   (d) Compare the three. What differences do you see?

   $$H(s) = \frac{10s}{(s + 10,000)(s + 100)}$$

5. Sketch the Bode plot using a straight-line approximation (procedures described in class) and then use Matlab to obtain the Bode Plot. Compare the two.

   $$H(s) = \frac{100,000(s + 10)^3}{s^2(s + 10k)(s + 1k)}$$

6. Use PSPICE to simulate the circuit of Fig. 1 and determine the Bode Plots. Print out the schematic, along with the plots. *(Double points – counts as two homework problems)*

7. Analyze the following circuit to find the transfer function $V_i/V_s$. Solve the circuit symbolically first (with $R_s, R_c, R_i, C_i$) and then plug in their values. Create a rough sketch of the transfer function using a straight-line approximation procedure.