

EE4435 Quiz 1

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Professor Leach

Name _____

Instructions. Print your name in the space above and on all quiz work sheets. Place a box around all answers. Write the word “over” if you continue your work on another page.

1. For the circuit in Figure P1:
 - (a) Solve for V_o/V_i . Put the answer in standard form, i.e. $1 + \tau s$ for the pole and zero terms.
 - (b) Solve for V_o/V_i by setting $I_a + I_f = 0$.
 - (c) Sketch the Bode magnitude plot for $|V_o/V_i|$. Label the plot.
2. Sketch the graph of v_O versus v_I for the Schmitt trigger circuit in Figure P2. The op amp has the saturation voltages ± 10 V.
3. In the peak detector circuit of Figure P3, v_I drops from +10 V to -1 V at $t = 0$. Solve for v_A , v_B , v_C , i_1 , and i_2 for $t > 0$. Assume a forward biased diode has a voltage drop of 0.7 V. If a diode is reverse biased, assume its current is zero unless the voltage across it is greater than $1 \mu\text{V}$. In that case, assume a reverse saturation current of 1 pA . Explain your logic in determining the state of each diode.
4. Using a single $0.1 \mu\text{F}$ capacitor, design a circuit which realizes the transfer function

$$\frac{V_o}{V_i} = 10 \frac{1 + s/100}{1 + s/10000}$$

