EE101
Tutorial 1 and Tutorial 2 (16-AUG-2013 and 20-AUG-2013)

1. In the circuit shown in Figure for problem 1, calculate V_O-V_i characteristic assuming the forward voltage drop across the diodes to be 0.7 volts. (Use your V_O-V_i characteristic to draw the output voltage waveform. i.e. $V_O(t)$.)

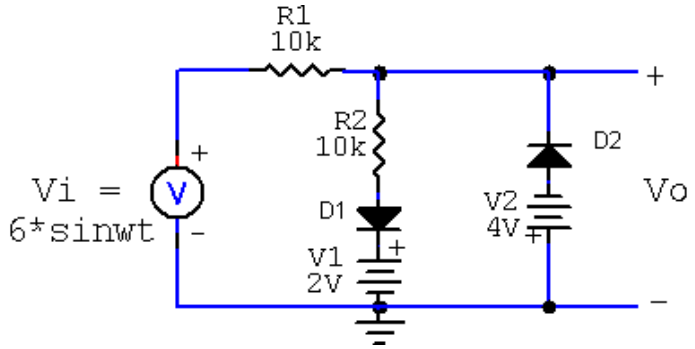

Figure for Problem 1

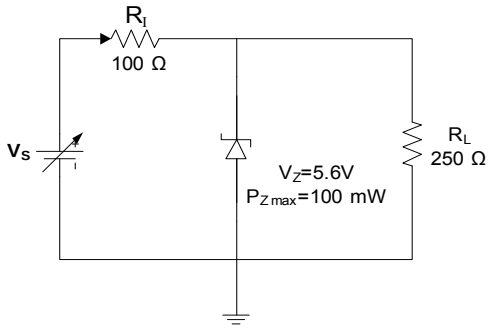

Figure for Problem 2

2. (a) For the circuit shown in figure for problem 2, what is the maximum value of the source voltage V_S for which the voltage across the load resistance R_L can be maintained at 5.6V?

(b) If the Zener diode is such that a minimum current of 1 mA is required for the Zener action to take place, what is the minimum source voltage V_S that can be used?

3. For the circuit, given in Figure for problem 3 using the simple on/off model of diode with knee voltage $V_k = 0.7V$ for both the diodes, find v_D, v_R and the total diode current (= resistor current). Could the individual diode currents i_{D1} and i_{D2} be also determined?

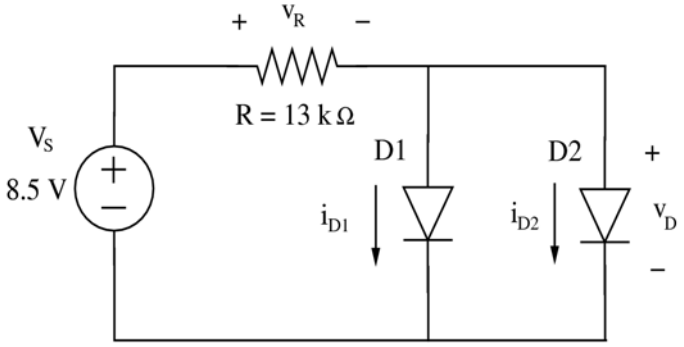

Figure for Problem 3

4. For the circuit shown in Figure for problem 4 find (a) I and (b) the power dissipated in the 4Ω resistor.

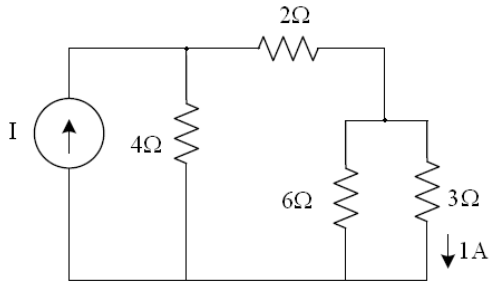

Figure for Problem 4

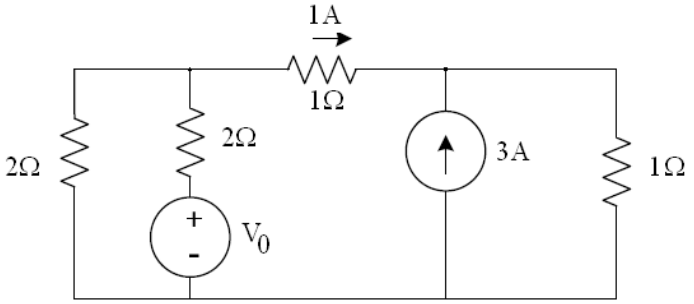

Figure for Problem 5

5. For the circuit shown in Figure for problem 5, find V_0 (1 A current flows through 1 Ohm resistance as shown)

6. For the circuit shown in Figure for problem 6, find the mesh currents I_1 and I_2

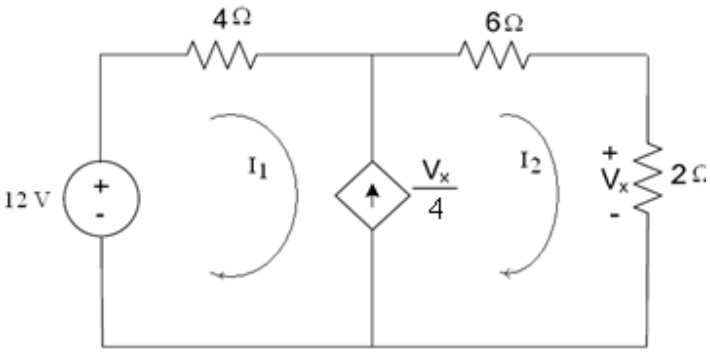

Figure for Problem 6

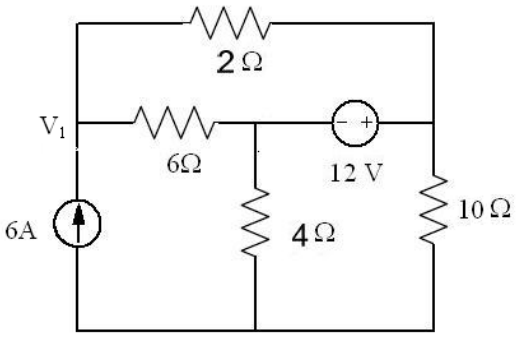

Figure for Problem 7

7. Using nodal analysis, find node voltage V_1 in the circuit shown in Figure for problem 7.

8. For the given circuit, shown in Figure for Problem 8 sketch the output voltage v_o and determine the dc voltage available at the output.

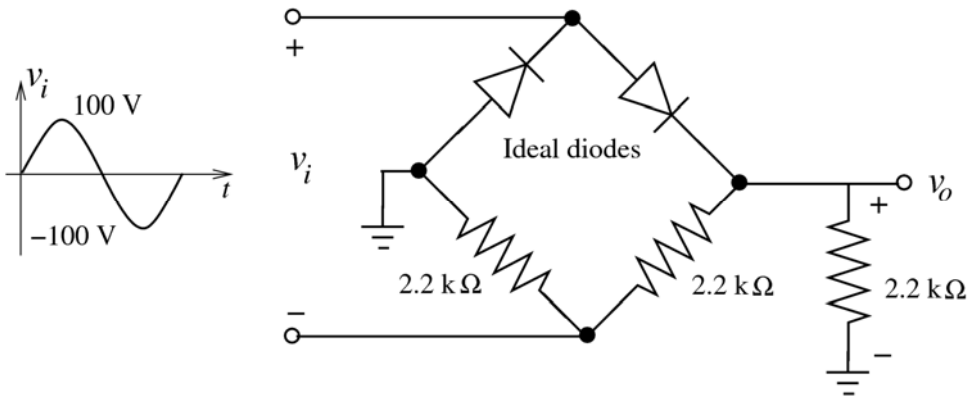

Figure for Problem 8