EE530L: Home work 1

(1.) Find the equivalent resistances between each of the terminal pairs (1,2), (2,3), and (3,1) in figure 1.

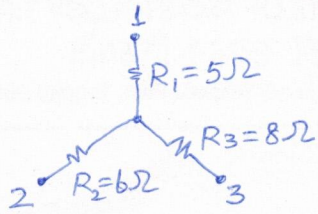

Figure 1

(2.) Solve for the current i flowing through impedance Z_0 in Fig. 2. Assume $v, i_1, i_2, Z_1, \ldots, Z_7$ are all given.

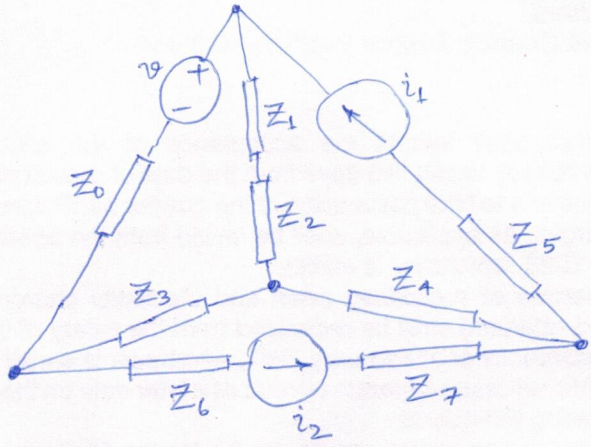

Figure 2

(3.) How many linearly independent currents exist in the network/circuit shown in Figure 3? Assume all the blobs are passive two terminal networks.

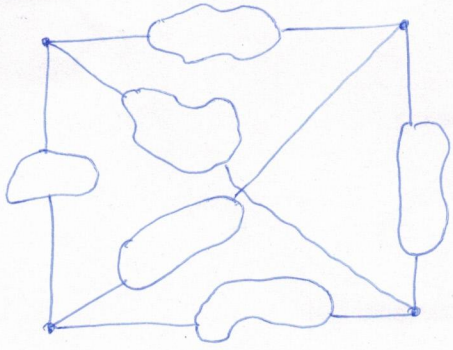

Figure 3

(4) If the two circuits in Fig. 4 are equivalent as seen from the 2 terminals, find v_{Th} and R_{Th}.

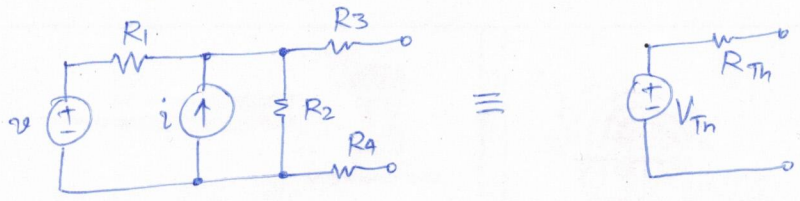

Figure 4

(5) If the two circuits in Fig. 5 are equivalent as seen from the two terminals, find i_{No} and R_{No}.

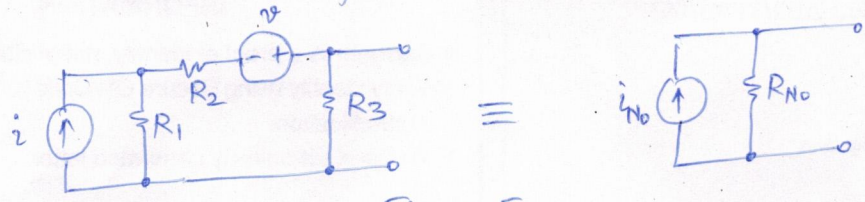

Figure 5

(6) Solve for the voltage across Z_0 in the circuit of Fig. 6.

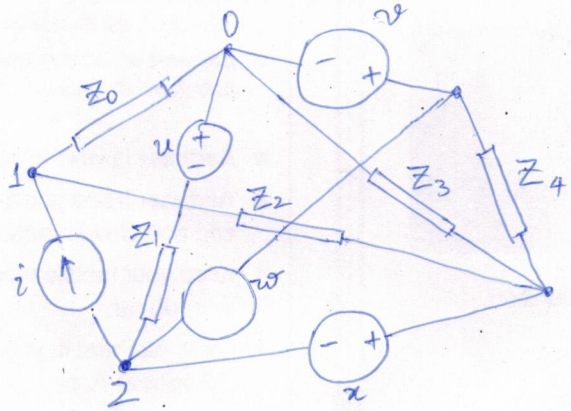

Figure 6

(7) Find voltage at node 0 in the circuit of Fig. 7. Assume $v_1, v_2, v_3, v_4, i_5, R_1, R_2, L_3, C_4, R_6$ are all known.

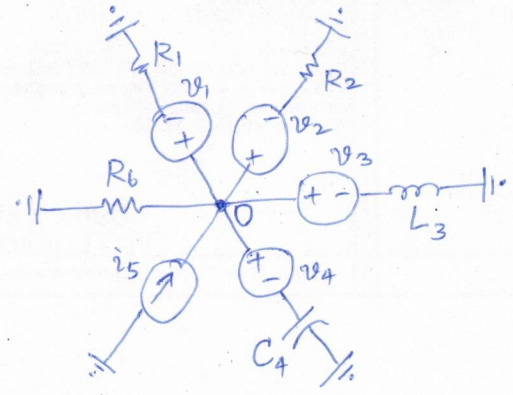

Figure 7

(8.) Find (i) R_L given R_S, and (ii) R_S given R_L, for

(a) maximum power transfer from source v_S to load R_L;

(b) maximum efficiency.

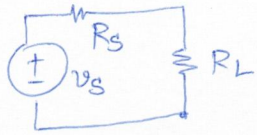

Figure 8