Ser	Name	ID#	SEC#

Assume the following:
Element 1 with voltage v_1
absorbs -12 W.
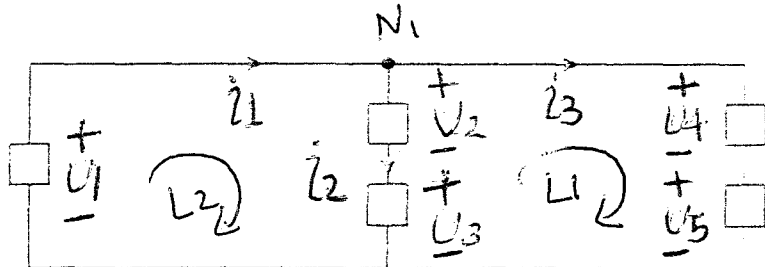$v_2 = v_3 = 2$ V.
$v_4 = 1$ V
$i_3 = 1$ A
Determine v_1, v_5 i_1, i_2 and
Verify Conservation of
Power.

apply KVL for L1 :-

$-V_3 - V_2 + V_4 + V_5 = 0 \Rightarrow V_5 = V_2 + V_3 - V_4 = 2 + 2 - 1$

$$\boxed{V_5 = 3 \text{ V}}$$

apply KVL for L2 :-

$-V_1 + V_2 + V_3 = 0 \Rightarrow V_1 = V_2 + V_3 = 2 + 2 \Rightarrow \boxed{V_1 = 4 \text{ V}}$

apply the power law for element 1 :-

$P = -V_1 i_1 \Rightarrow -12 = -(4) i_1 \Rightarrow \boxed{i_1 = 3 \text{ A}}$

apply KCL at N_1 :-

$i_1 = i_2 + i_3 \Rightarrow i_2 = i_1 - i_3 = 3 - 1 \Rightarrow \boxed{i_2 = 2 \text{ A}}$

$P_1 = -12 W$; $P_2 = i_2 V_2 = 4 W$; $P_3 = i_2 V_3 = 4 W$

$P_4 = i_3 V_4 = 1 W$; $P_5 = i_3 V_5 = 3 W$

$\sum_{i=1}^{5} P_i = -12 + 4 + 4 + 1 + 3 = 0$