1.39 Find I_o in the network in Fig. P1.39 using Tellegen's theorem.

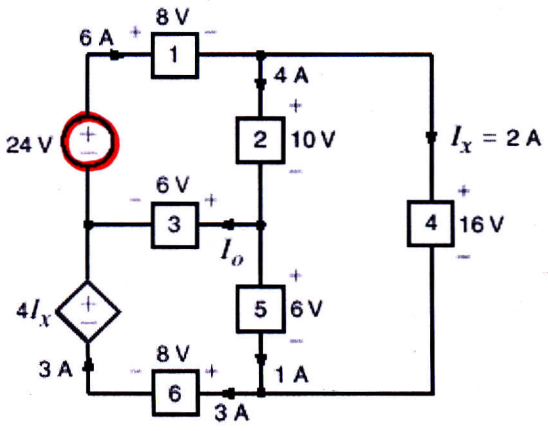

Figure P1.39

SOLUTION:

$P_{24V} = 24(-6) = -144$ W

$P_{24V} = 144$ W supplied

$P_1 = 8(6) = 48$ W absorbed

$P_2 = 10(4) = 40$ W absorbed

$P_3 = 6I_0$ ABSORBED

$P_4 = 16(2) = 32$ W absorbed

$P_5 = 6(1) = 6$ W absorbed

$P_6 = 8(3) = 24$ W absorbed

$P_{4I_x} = 4I_x(-3) = -12(2) = -24$ W

$P_{4I_x} = 24$ W supplied

Power supplied = Power absorbed

$P_{24V} + P_{4I_x} = P_1 + P_2 + P_3 + P_4 + P_5 + P_6$

$144 + 24 = 48 + 40 + 6I_0 + 32 + 6 + 24$

$I_0 = 3$A