

Homework Assignment #4 – Nodal Analysis

Reading Assignment:

Chapter 4, Sections 1 - 8, from **Electric Circuits, 8th Ed.**, by Nilsson

Problem Assignment:

Nodal analysis problems: 9, 10a, 12, 14, 19, 21, 22, 4.31a (using node equations)

Selected Answers:

4-11a) $i_1 = 23.76 \text{ A}$, $i_2 = 5.33 \text{ A}$, $i_3 = 18.43 \text{ A}$, $i_4 = 15 \text{ A}$, $i_5 = 9.77 \text{ A}$, $i_6 = 8.66 \text{ A}$

4-12) $V_1 = 100 \text{ V}$, $V_2 = 20 \text{ V}$

4-14) Note: Combine the series resistors first ($2 + 3 = 5\Omega$ and $2.5 + 2.5 = 5\Omega$)

$V_1 = 380 \text{ V}$, $V_2 = 269 \text{ V}$, $V_3 = 111 \text{ V}$

4-15) $\Sigma P_{\text{diss}} = 306 \text{ W}$

4-24a) $i_1 = 1 \text{ mA}$, $i_2 = -20 \text{ mA}$, $i_3 = 31 \text{ mA}$

4-25) $v_o = 20 \text{ V}$

4-31a) Note: Combine the series resistors first ($2 + 3 = 5\Omega$ and $4 + 1.5 = 5.5\Omega$)

$V_B = -9\text{V}$ (node B at the top of the 45Ω resistor and ground at the bottom)

$i_a = 9.8 \text{ A}$, $i_b = -0.2 \text{ A}$, $i_c = -10 \text{ A}$

4-43) $\Sigma P_{\text{del}} = 5157 \text{ W}$