

Homework - Study Problems Chapter 4

From the textbook “Electric Circuits” by Nilsson and Riedel (11th edition), work the following problems:

----- Node-voltage method

- 4.6 Ans: 3.33 V
4.10 Ans: 120 V, 96 V
4.11 Ans: 100 V, 20 V
4.12 Ans: a) 8 A, 2 A, 6 A, 2 A, 4 A
 b) -360 W (delivered or developed). Note: The two sources deliver power.
4.13 Ans: a) 60 V, 73 V, -13 V
 b) 200 W
4.14 Ans: a) 23.76 A, 5.33 A, 18.43 A, 15 A, 9.77 A, 8.66 A
 b) 5273.09 W
4.15 Ans: 2430 W
4.18 Ans: a) 10 V
 b) 2.4 W
4.19 Ans: a) 40 W
 b) 40 W
4.20 Ans: a) 15 V
 b) 11.25 W
 c) $P_{450\text{ mA}} = -6.75 \text{ W}$ (delivered), $P_{45\text{ V}} = -54 \text{ W}$ (delivered)
4.21 Ans: a) 156 V, 120 V, 78 V
 b) 2772 W

----- Mesh-current method

- 4.32 Ans: a) 8 A, 2 A, 6 A, 2 A, 4 A
 b) -360 W (delivered or developed). Note: The two sources deliver power.
4.33 Ans: a) 23.76 A, 5.33 A, 18.43 A, 15 A, 9.77 A, 8.66 A
 b) 5273.09 W
4.37 Ans: a) -17,940 W
 b) 17,940 W
4.39 Ans: 15 W
4.40 Ans: -46,640 W
4.41 Ans: 2,700 W

----- Source transformations

- 4.59 Ans: a) 20 mA
 b) Verify
4.60 Ans: a) -4.5 mA

- 4.61 Ans: b) -397.8 mW
a) 12.5 V
b) Verify
- 4.62 Ans: a) -0.85 A
b) -0.85 A
- 4.63 Ans: a) 400 V
b) -1872 W
c) -120 W
d) 1992 W

----- Thévenin – Norton equivalents

- 4.64 Ans: $V_{Th} = 48 \text{ V}$, $R_{Th} = 16 \Omega$
- 4.65 Ans: $I_N = 50 \text{ mA}$, $R_N = 2 \text{ k}\Omega$
- 4.66 Ans: $I_N = 8.67 \text{ A}$, $R_N = 6 \Omega$
- 4.67 Ans: $V_{Th} = 30 \text{ V}$, $R_{Th} = 15 \Omega$
- 4.68 Ans: $I_N = 8 \text{ mA}$, $R_N = 10 \text{ k}\Omega$