EE 100 HOMEWORK SET 6 Fall 2004

Issued: October 4, 2004 Due: October 11, 2004

1. Do Problem 3.33.

2. Do Problem 3.34.

3. Do Problem 3.35.

4. Do Problem 3.44.

5. Do Problem 3.49.

6. Do Problem 3.53.

3.33 Determine, using superposition, the voltage across R in the circuit of Figure P3.33.

$I_B = 12$ A $\quad R_B = 1\ \Omega$

$V_G = 12$ V $\quad R_G = 0.3\ \Omega$

$R = 0.23\ \Omega$

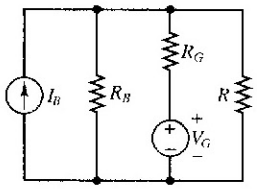

Figure P3.33

3.34 Using superposition, determine the voltage across R_2 in the circuit of Figure P3.34.

$V_{S1} = V_{S2} = 12$ V

$R_1 = R_2 = R_3 = 1\ \text{k}\Omega$

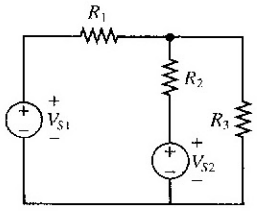

Figure P3.34

3.35 With reference to Figure P3.35, using superposition, determine the component of the current through R_3 that is due to V_{S2}.

$V_{S1} = V_{S2} = 450$ V

$R_1 = 7\ \Omega \quad R_2 = 5\ \Omega$

$R_3 = 10\ \Omega \quad R_4 = R_5 = 1\ \Omega$

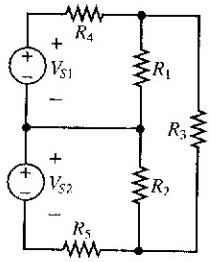

Figure P3.35

3.44 Find the Thévenin equivalent resistance seen by resistor R_5 in the circuit of Figure P3.6. Compute the Thévenin (open-circuit) voltage and the Norton (short-circuit) current when R_5 is the load.

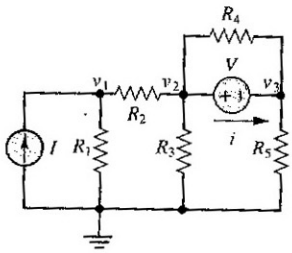

Figure P3.6

3.49 Find the Thévenin equivalent resistance seen by resistor R in the circuit of Figure P3.33. Compute the Thévenin (open-circuit) voltage and the Norton (short-circuit) current when R is the load.

3.53 A nonideal voltage source is modeled in Figure P3.53 as an ideal source in series with a resistance that models the internal losses, that is, dissipates the same power as the internal losses. In the circuit shown in Figure P3.53, with the load resistor removed so that the current is zero (i.e., no load), the terminal voltage of the source is measured and is 20 V. Then, with $R_L = 2.7\ \text{k}\Omega$, the terminal voltage is again measured and is now 18 V. Determine the internal resistance and the voltage of the ideal source.

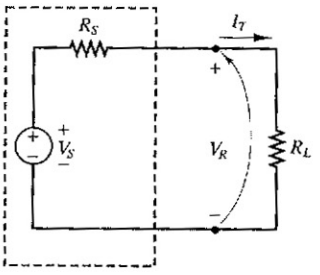

Figure P3.53