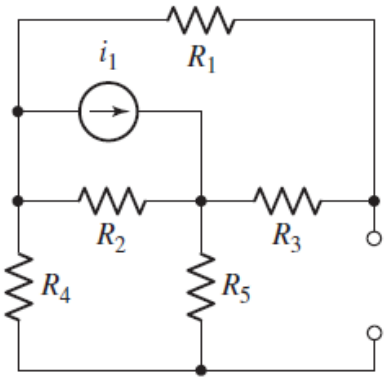
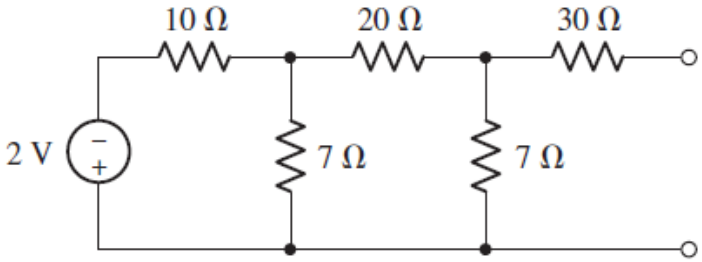
Basic Electronics (ECE113)
Tutorial 4

1) (a) Employ Thevenin's theorem to obtain a two-component equivalent for the network shown in Fig. shown below.
(*b*) Determine the power supplied to a 1 MΩ resistor connected to the network if i_1 = 19 *μ*A, *R*1 = *R*2 = 1.6 MΩ, *R*2 = 3 MΩ, and *R*4 = *R*5 = 1.2 MΩ.



2) (a) Obtain a value for the Thévenin equivalent resistance seen looking into the open terminals of the circuit shown below by first finding V_{OC} and I_{SC}.
(*b*) Connect a 1 A test source to the open terminals of the original circuit after shorting the voltage source, and use this to obtain R_{TH}.
(*c*) Connect a 1 V test source to the open terminals of the original circuit after again zeroing the 2 V source, and use this now to obtain R_{TH}.



3.) With regard to the circuit of Fig. 5.82, determine the power dissipated by
(*a*) a 1 kΩ resistor connected between *a* and *b*;
(*b*) a 4.7 kΩ resistor connected between *a* and *b*;
(*c*) a 10.54 kΩ resistor connected between *a* and *b*.

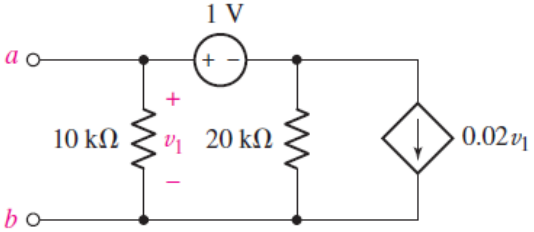


FIGURE 5.82

4) For the circuit of Fig. 5.90, what value of R_L will ensure it absorbs the maximum possible amount of power?

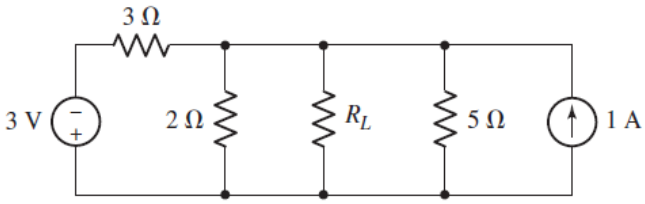


FIGURE 5.90

5.) Referring to the circuit of Fig. 5.92,
(*a*) determine the power absorbed by the 3.3 Ω resistor;
(*b*) replace the 3.3 Ω resistor with another resistor such that it absorbs maximum power from the rest of the circuit.

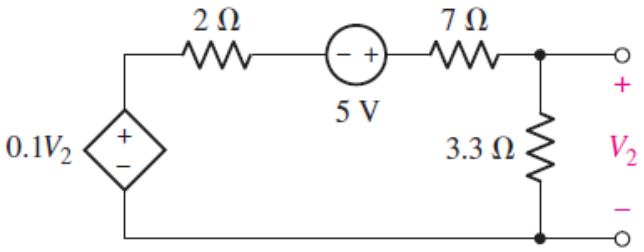


FIGURE 5.92

6. For the network of Fig. 5.98, select a value of *R* such that the network has an equivalent resistance of 70.6 Ω.

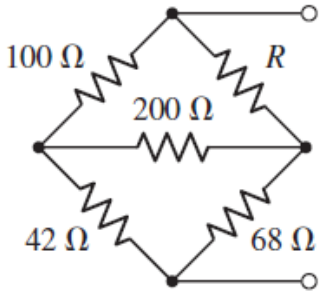


FIGURE 5.98