Tutorial-4
Winter 2024
Basic Electronics (ECE113)

Q1: **(a)** Employ superposition to determine the individual contribution from each independent source to the voltage v as labelled in the circuit shown in Figure-1. **(b)** Compute the power absorbed by the **2 Ω** resistor.

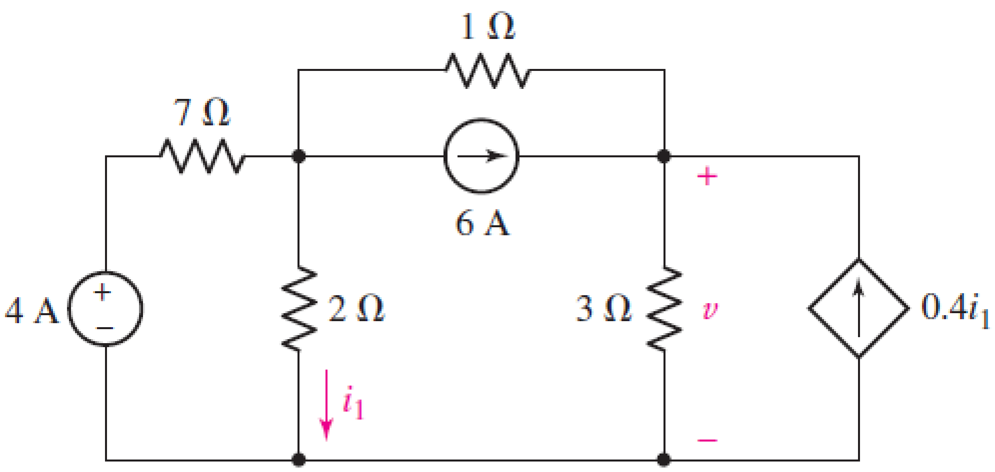

Figure 1

Q2: For the circuit of Figure-2, plot $\boldsymbol{i_L}$ versus $\boldsymbol{v_L}$corresponding to the range of $\mathbf{0} \le \boldsymbol{R} \le \infty$.

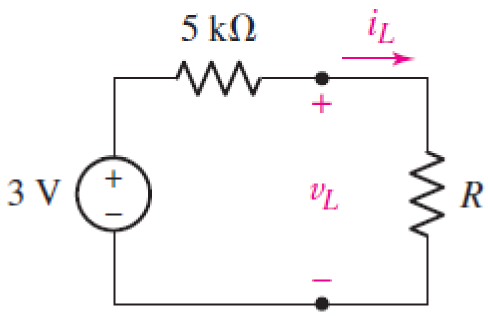

Figure 2

Q3: With regard to the circuit represented in Figure-3, first transform both voltage sources to current sources, reduce the number of elements as much as possible, and determine the voltage $\mathbf{V_3}$.

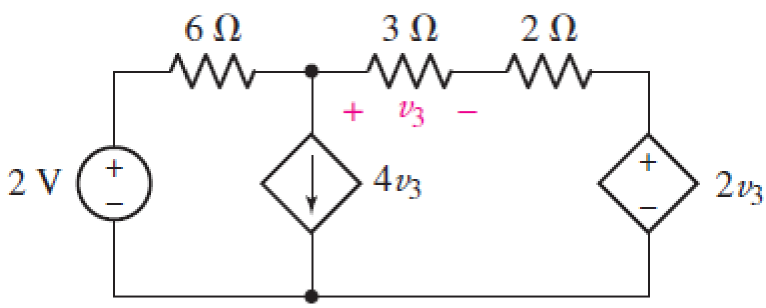

Figure 3

Q4: Determine the Thevenin equivalent of the network shown in Figure-4, as seen looking into the two open terminals.

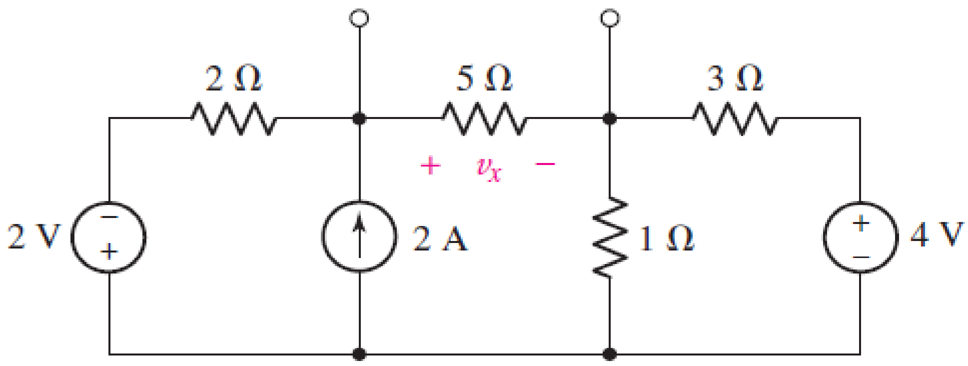

Figure 4

Q5: For the circuit of Figure-5, **(a)** Employ Norton's theorem to reduce the network connected to $\boldsymbol{R_L}$ to only two components. **(b)** Calculate the downward directed current flowing through $\boldsymbol{R_L}$ if it is a **3.3 KΩ** resistor.

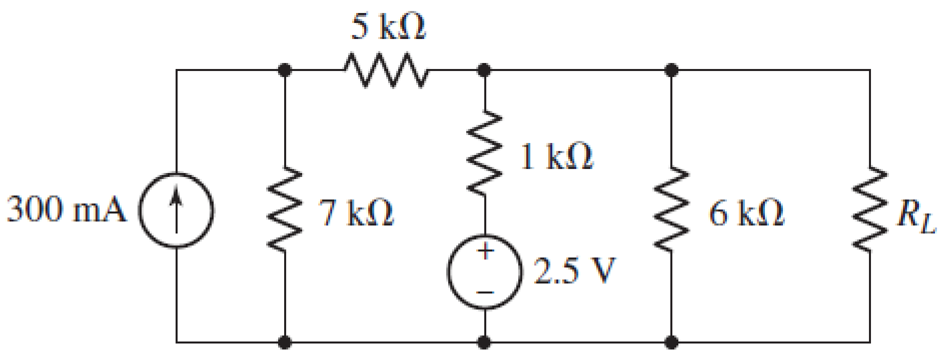

Figure 5

Q6: With regard to the network depicted in Figure-6, determine the Thevenin equivalent as seen by an element connected to terminals **(i)** $\boldsymbol{a\ and\ b}$ **(ii)** $\boldsymbol{a\ and\ c}$ **(iii)** $\boldsymbol{b\ and\ c}$.

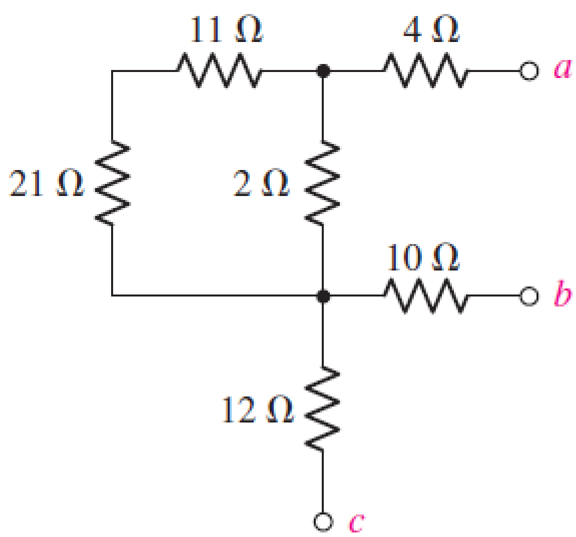

Figure 6

Q7: Employ Thevenin's theorem to obtain a two-component equivalent for the network shown in Figure-7 & Determine the power supplied to a **1 M Ω** resistor connected to the network if current $\mathbf{I_1}$ **= 19 μA,** $\mathbf{R_1 = R_2}$ **= 1.6 M Ω,** $\mathbf{R_3}$ **= 3 M Ω,** and $\mathbf{R_4 = R_5}$ **= 1.2 M Ω.**

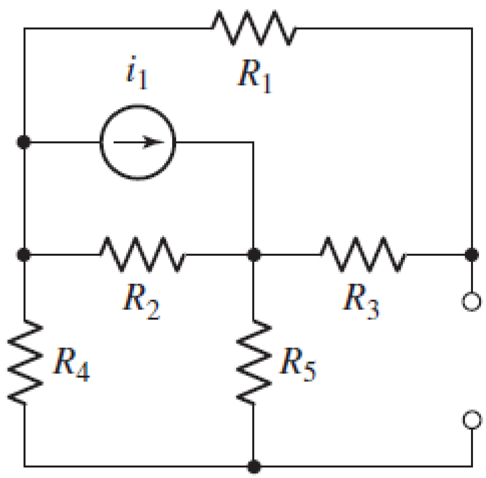

Figure 7