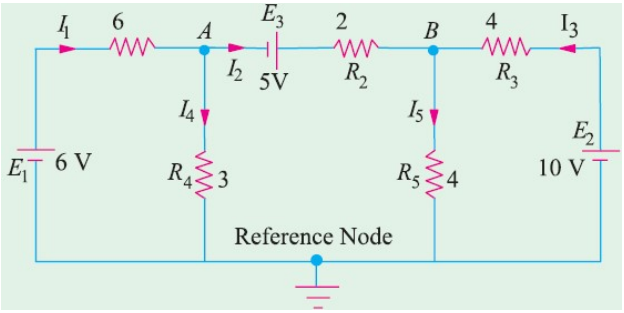
Assignment Problems #2

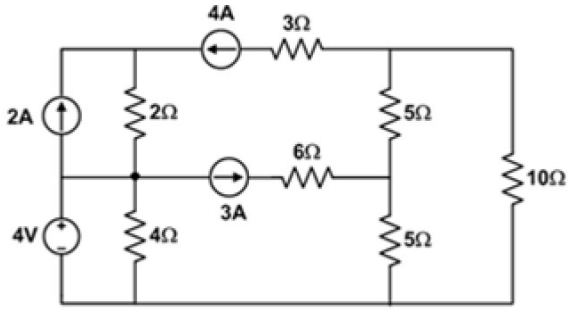
Subject: Basic Electrical Engineering

1. Find the branch currents in the given circuit by using (i) nodal analysis and (ii) loop analysis.



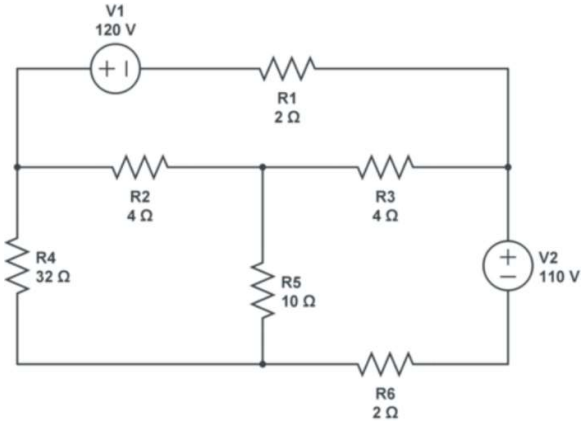
[7/9 A, 1/3 A, 13/12 A, 4/9 A, 17/12 A]

2. Using nodal analysis, determine the power delivered to the 10 Ω resistor.



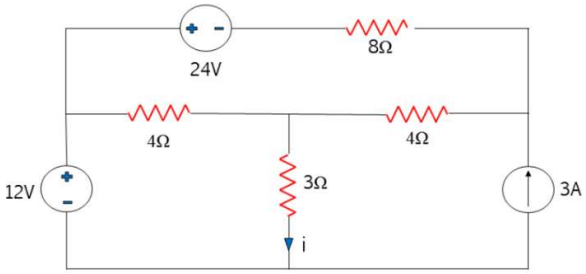
[15.625 W]

3. Using mesh analysis, determine power dissipated in the 32 Ω resistor.



[800 W]

4. In the given circuit, find the value of current '***i***' using superposition theorem.

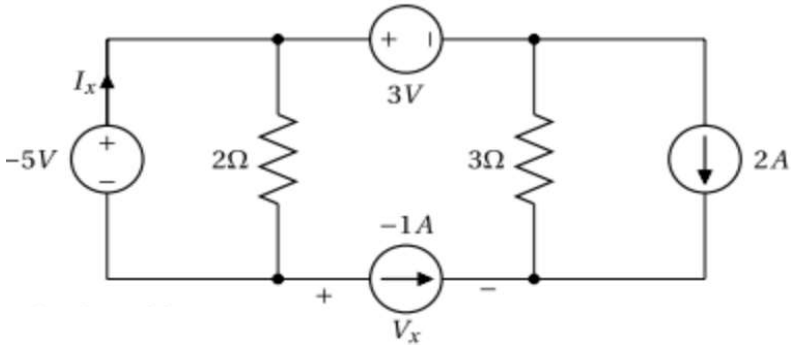


[2A]

Assignment Problems #2

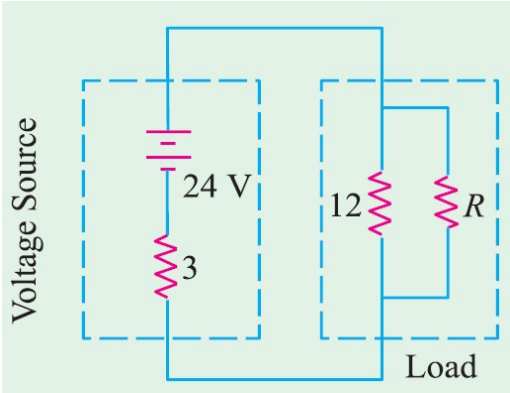
Subject: Basic Electrical Engineering

5. Determine V_x and I_x in the following circuit using the superposition method.



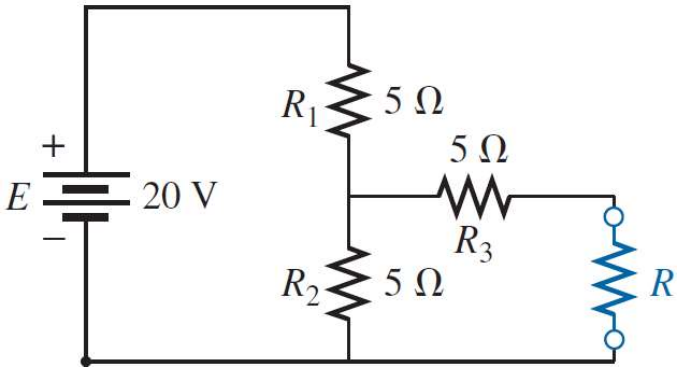
[5V, -1.5 A]

6. In the circuit below, what value of R will allow maximum power transfer to the load ? Also calculate the maximum total load power. All resistances are in ohms.



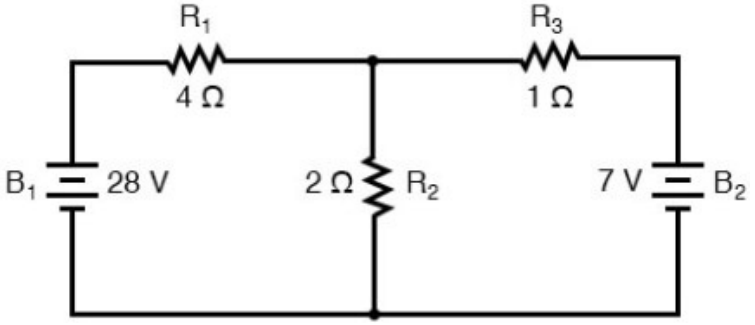
[4 Ω, 48 W]

7. (i) Find the Thévenin equivalent circuit for the network external to the resistor R for the network shown below. Find the power delivered to R when R is 2 Ω and 100 Ω.



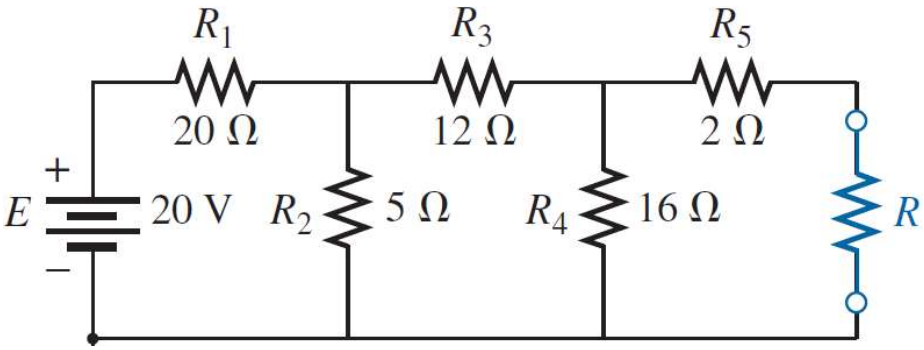
((i) R_{TH} = 7.5 Ω, V_{TH} = 10 V, (ii) 2.22 W, 0.87 W)

8. Determine the current through the 2 Ω resistor in the following circuit applying Thevenin's theorem.



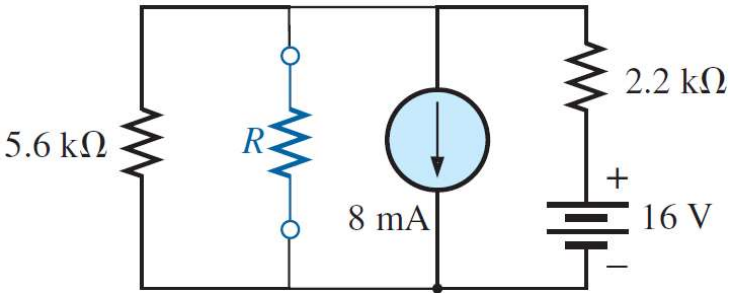
[4 A]

9. ~~Find the current flowing through R by applying Norton's theorem.~~ Find the Norton equivalent circuit and current through R when R is equal to 10 Ω.



[0.1 A]

10. Find the Norton equivalent circuit for the network external to resistor R.



[R_N = 1.58 kΩ, I_N = 0.73 mA]