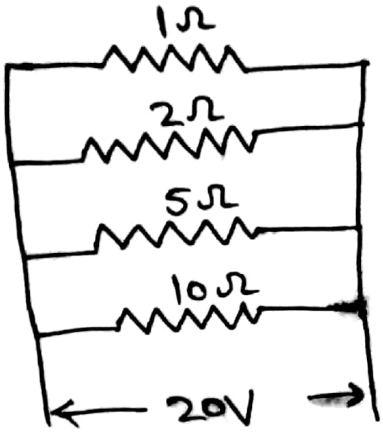
Unit - 1

Numerical Practice set

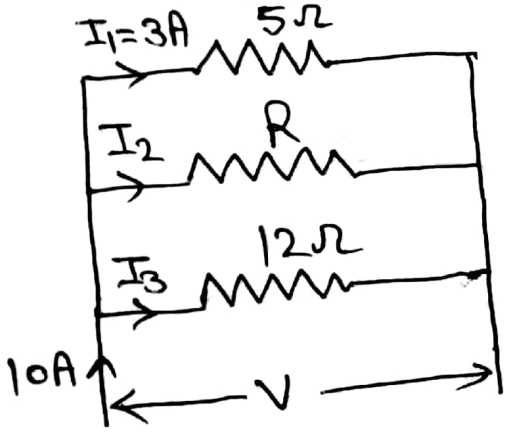
By :- Rajeev saini

1. For the given circuit, find the total resistance and the current through each branch.



Ans → 20, 10, 4, 2
(All in Amperes)

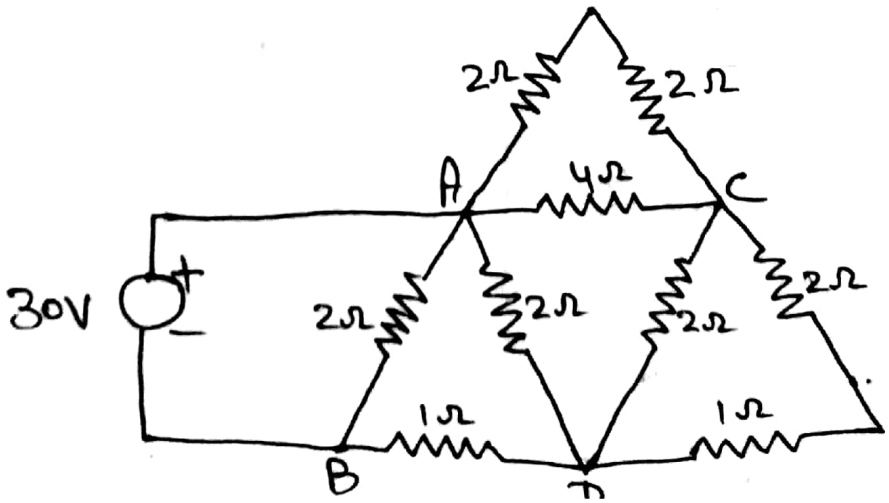
2. Find the value of unknown resistance R and total circuit resistance for the given circuit.



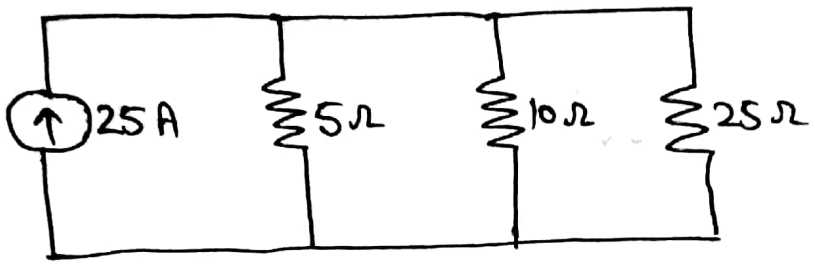
Ans → 2.6087 Ω,
1.5 Ω

3. Determine the current delivered by the source in the circuit given below:

Ans → 28.46A

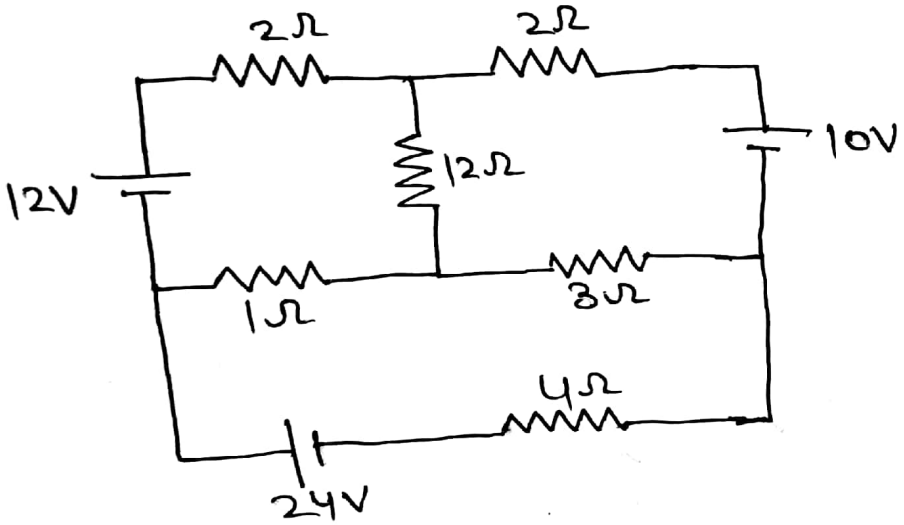


4. Determine the current in all resistors in the circuit given below:



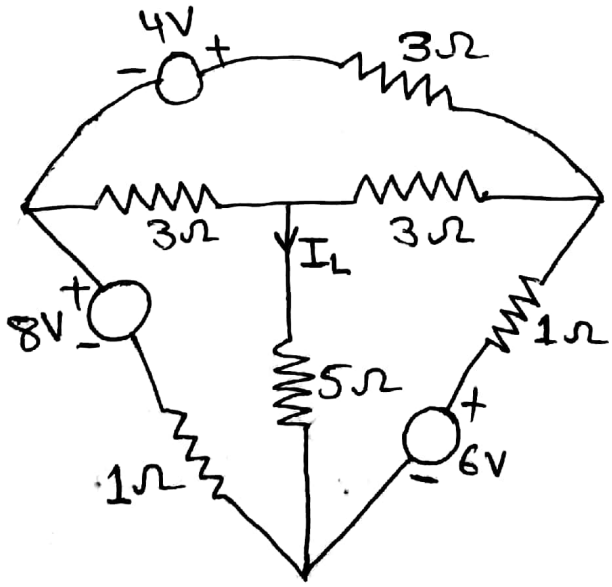
Ans→ 14.705A, 7.3529A, 2.9412A.

5. Determine the current in the 4Ω branch using mesh analysis method.



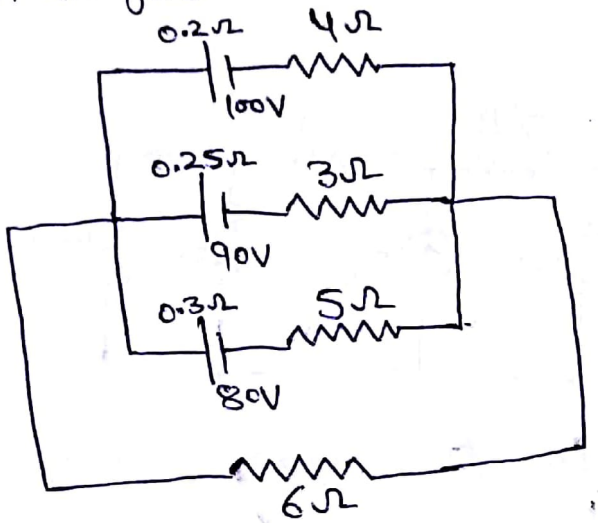
Ans→ 4.1114 A.

6. Determine the current I_L in the circuit shown below.



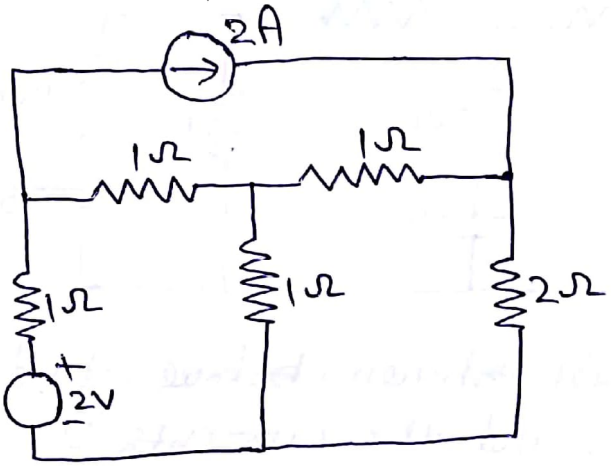
Ans→ 1 A

7. Solve the network for the current through 6Ω resistor. using mesh analysis.



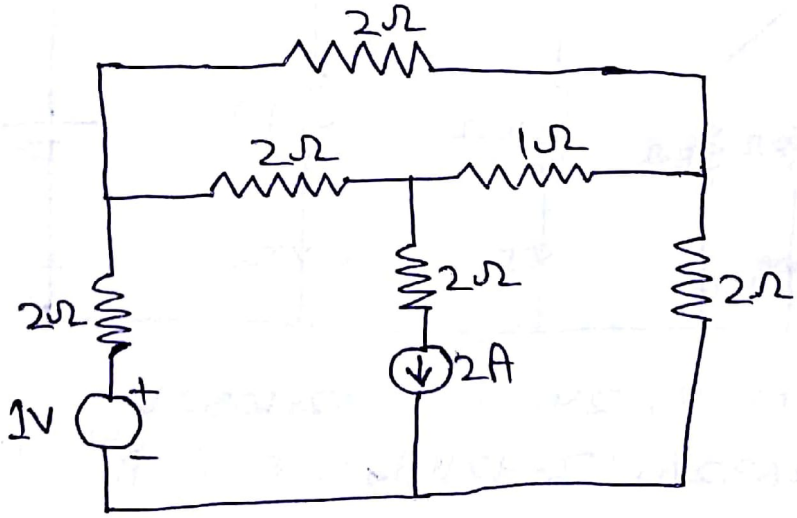
Ans→ -12.389A

8. (i) Find out loop currents for the circuit given below
(ii) Find current thro. 2Ω resistor.
(iii) Find Power delivered by 2V voltage source.



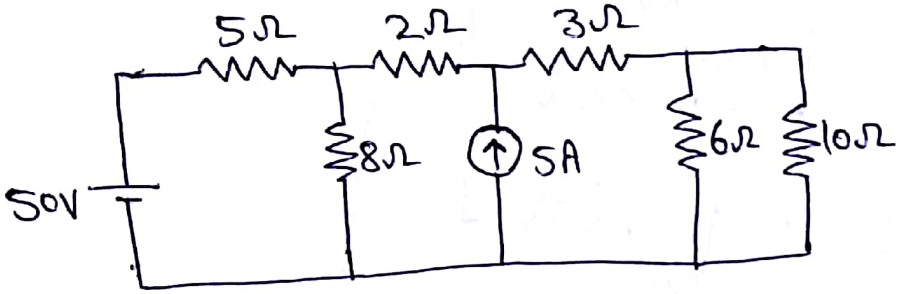
(i)
Ans→ 1.636A,
0.901A,
2A,
(ii) 0.901
(iii) 3.272W

9. Find out the current in each mesh using mesh current analysis for the circuit given below:



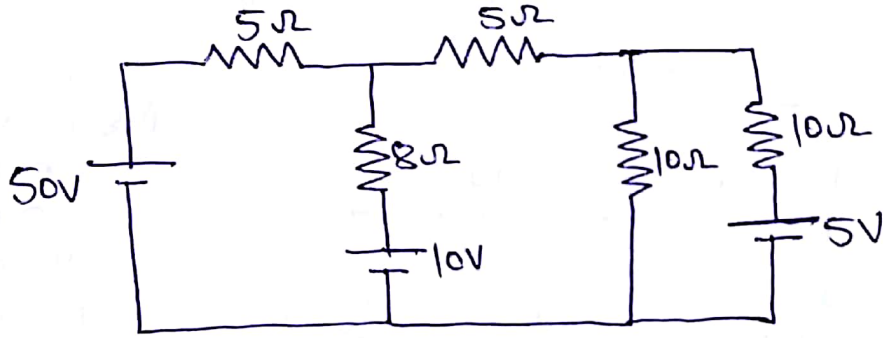
Ans→ 1.1154A
0.8846A
0.2692A

10. Determine the voltage at each node and current through each element in the circuit by node voltage method.



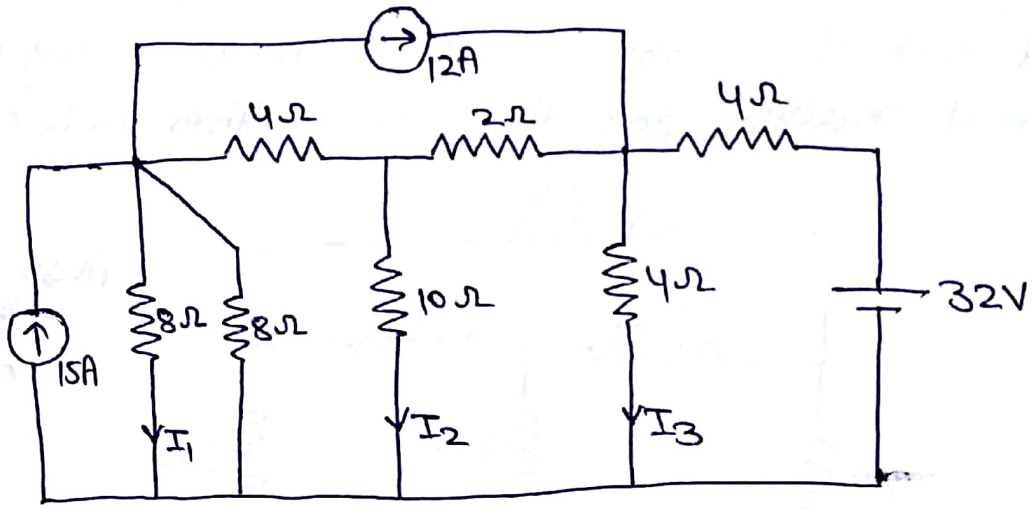
Ans → 31.526V
32.018V
17.769V
3.695A
0.246A
4.7496A
3.941A
2.962A
1.7769A

11. For the circuit shown below, find the current in each branch by nodal Analysis.



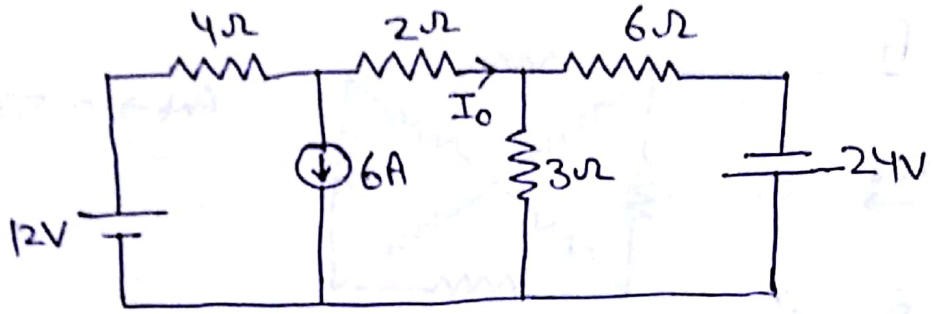
Ans → 4.588A
2.1324A
2.4559A
1.4779A
1.9559A

12. In the circuit shown below, find the different node voltages and the currents I_1, I_2 & I_3.



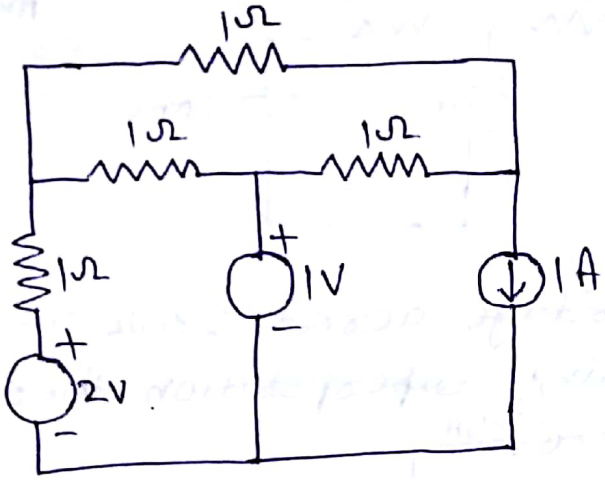
Ans → 18.1052V, 24.211V, 32.1052V
2.2632A, 2.4211A, 8.0263A

13. Use source transformation to find I_o in the circuit given below.



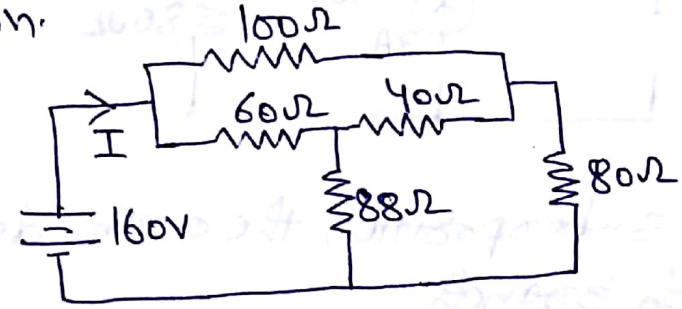
Ans → −0.5A

14. For the given circuit, find out the current in each branch using Nodal analysis.



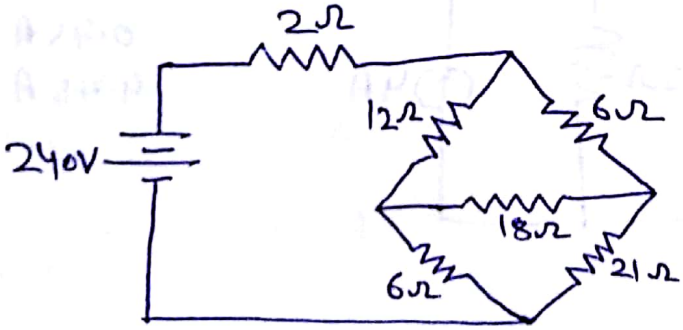
Ans → 0.2A, 0.8A, 0.6A, 0.4A.

15. Determine the current I using Star-Delta transformation.



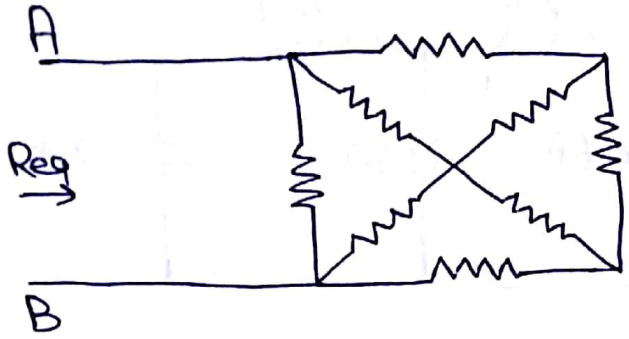
Ans → 2A.

16. Find the current I, using Star-Delta transformation.



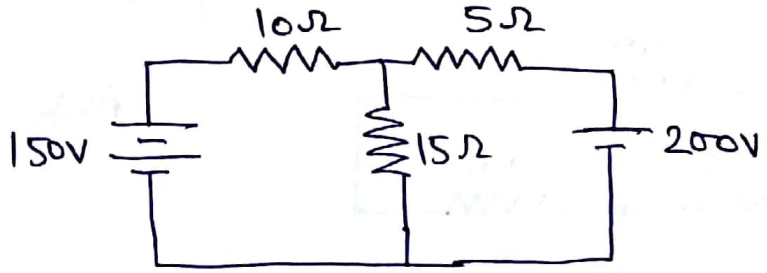
Ans → 20A

17. Calculate the equivalent resistance Rab when all the resistance values are equal to 1 Ω.



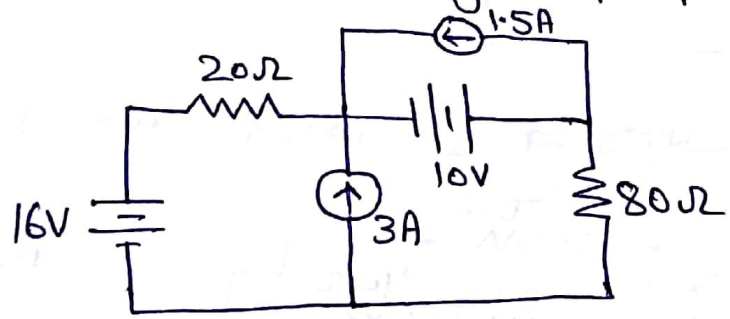
Ans→ 0.533 Ω

18. Find the current through 15Ω resistor using superposition theorem.



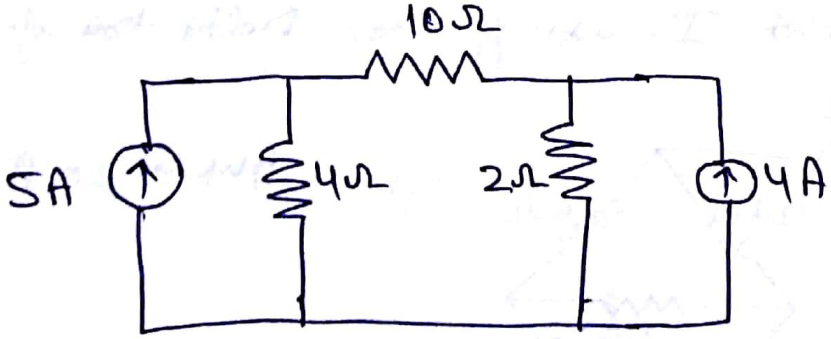
Ans→ 10A.

19. Determine the voltage across 20Ω resistance in the circuit using superposition theorem.



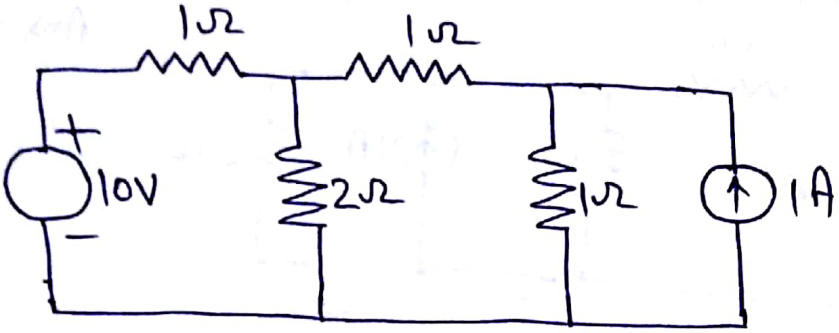
Ans→ 42.8V.

20. Using superposition theorem, determine the current in each branch.



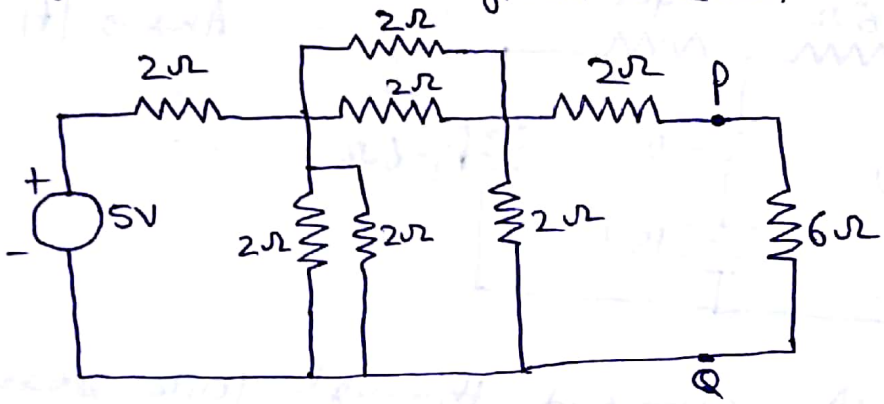
Ans→ 4.25A
0.75A
4.75A

21. Calculate the current through 2Ω resistor in the circuit using Superposition theorem.



Ans→ 2.625A.

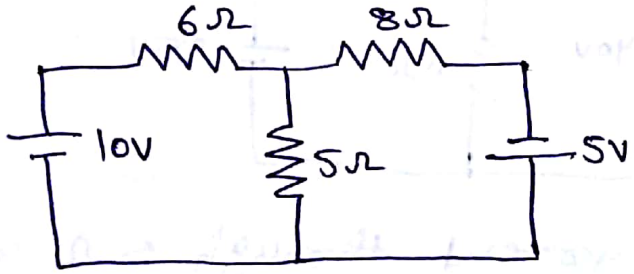
22. Determine the Thevenin's equivalent across terminal PQ for the circuit given below:



Ans→ E_{th} = 0.909 V

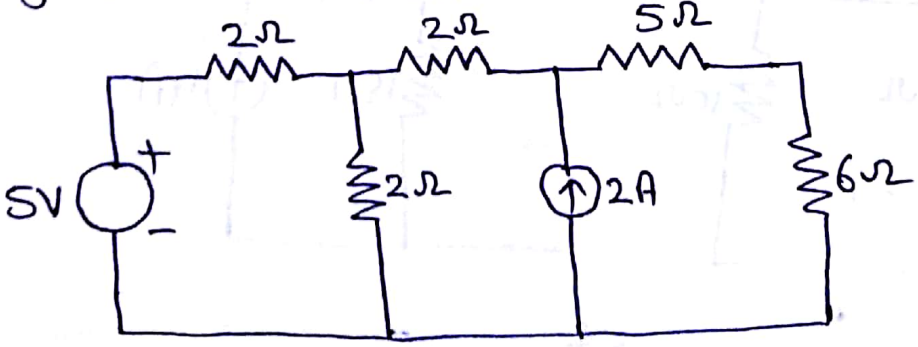
R_{th} = 2.909Ω

23. Determine the value of current through 5Ω resistance using Thevenin's theorem



Ans→ 0.4236 A

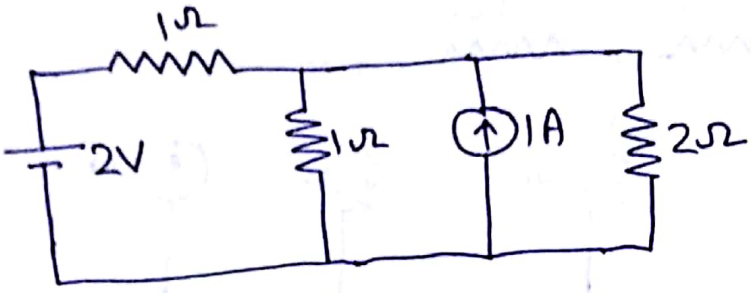
24. Determine the value of current through 6Ω resistance using Thevenin's theorem.



Ans→ 0.607 A

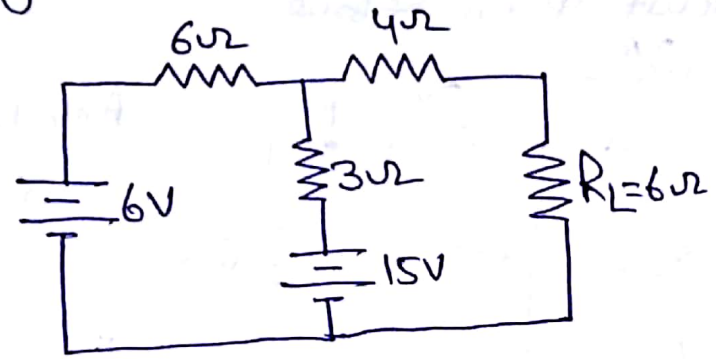
25. Calculate the current through 2Ω resistor using Thevenin's theorem.

Ans → 0.4A



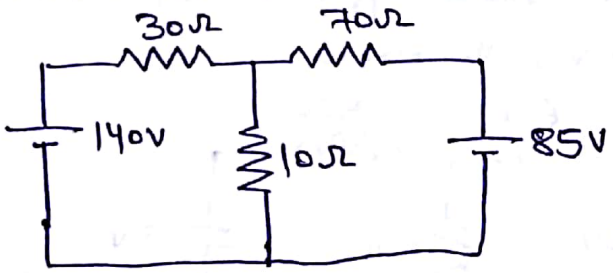
26. Calculate the current through R_L=6Ω resistance using Thevenin's theorem.

Ans → 1A



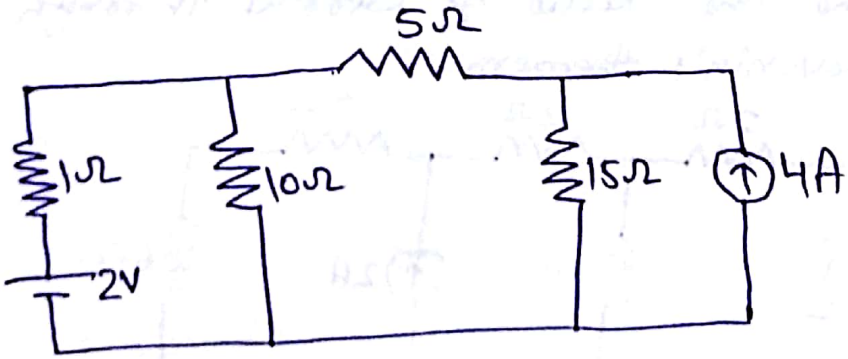
27. Calculate the current through 10Ω resistance using Thevenin's theorem.

Ans → 3.98 A

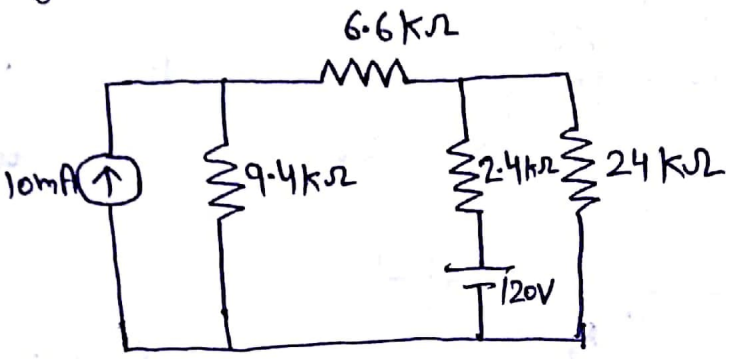


28. Calculate the current through 5Ω resistor using Thevenin's theorem.

Ans → 2.78A

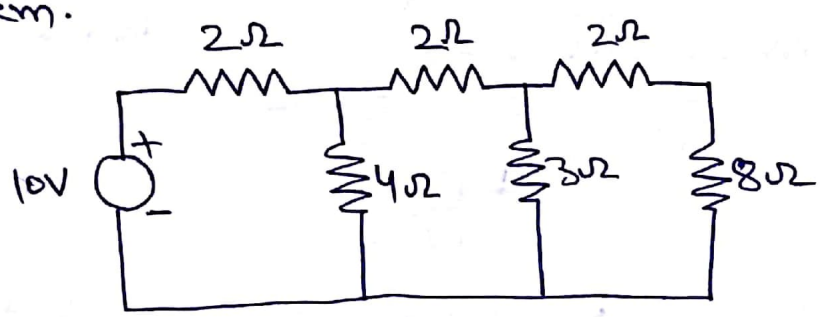


29. Find the value of current through 24 KΩ resistance using Norton's theorem.



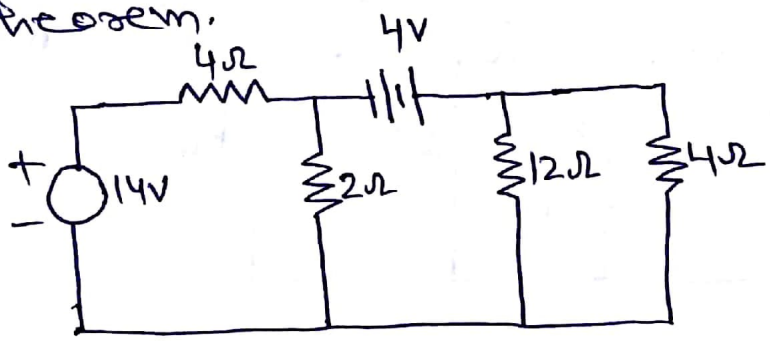
Ans → 4.47 mA

30. Find current through 8 Ω resistance using Norton's theorem.



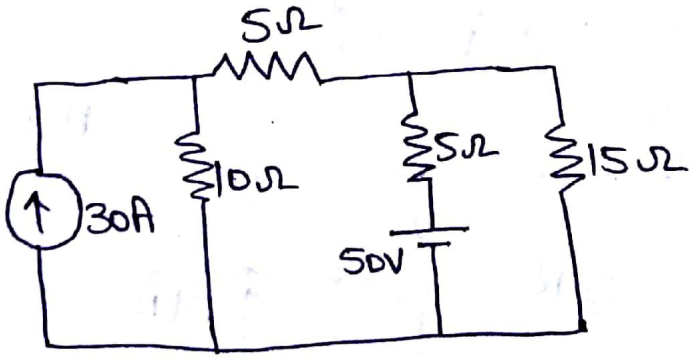
Ans → 0.2728 A

31. Find the voltage drop across 12 Ω resistance using Norton's theorem.



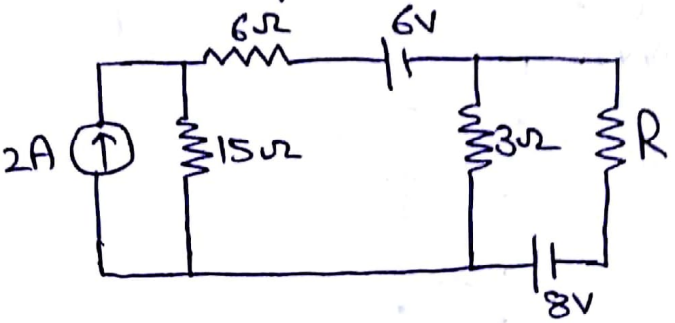
Ans → 6V

32. Find the value of current through 15 Ω resistor using Norton's theorem.



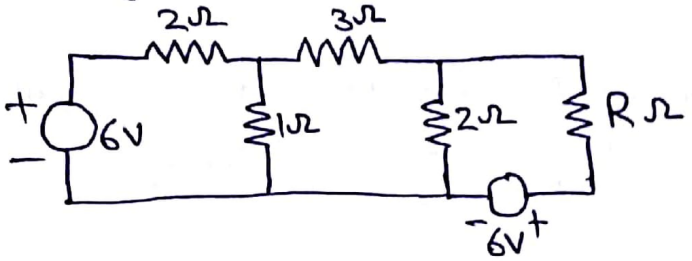
Ans → 6A

33. Find the value of resistance 'R' to have maximum power transfer in the circuit below. Also obtain the value of maximum power.



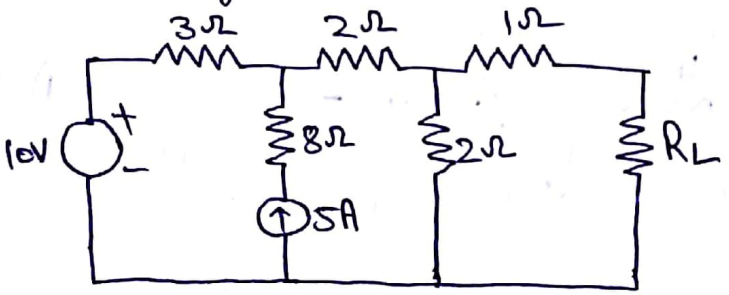
Ans → $\frac{21}{8}\Omega$, 11.524 W

34. Find the value of R in the circuit such that maximum power transfer takes place.



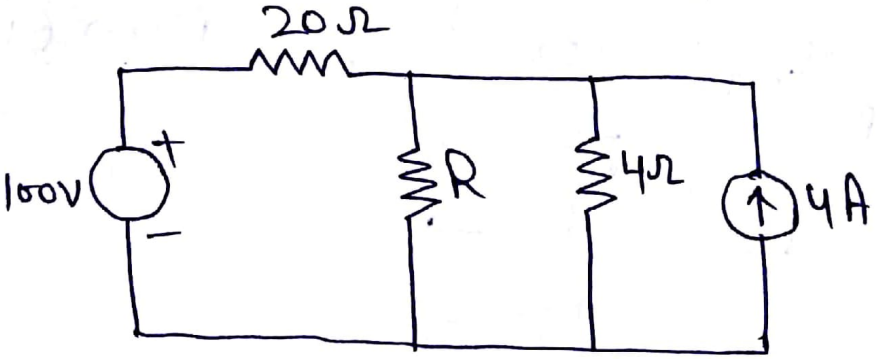
Ans → 1.29 Ω

35. Find the value of R_L in the circuit such that maximum power transfer takes place.



Ans → 2.4286 Ω.

36. For the circuit shown below, find the value of 'R' for maximum power transfer & also find out the maximum value of Power.



Ans → 3.333 Ω

67.507 W