ELEMENTS OF ELECTRICAL ENGINEERING
UE24EE141B

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Star Delta Transformations

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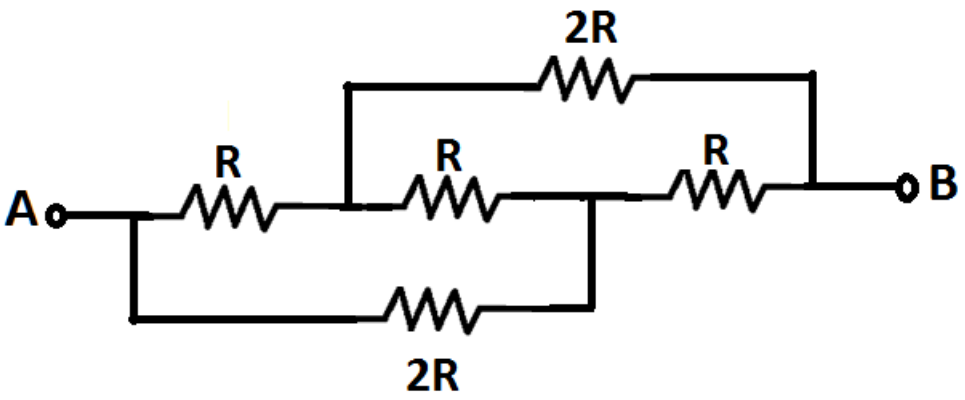
Star Delta Transformations – Numerical Example 3

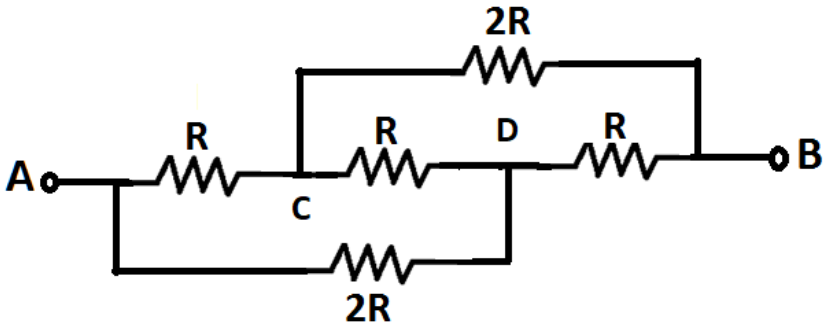
Question:

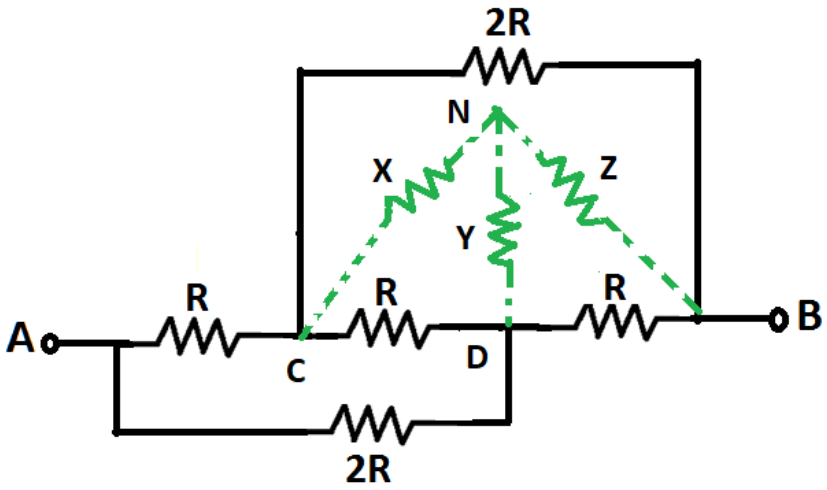
Find the equivalent resistance between the terminals A & B in the given network.



Star Delta Transformations – Numerical Example 3

Solution:





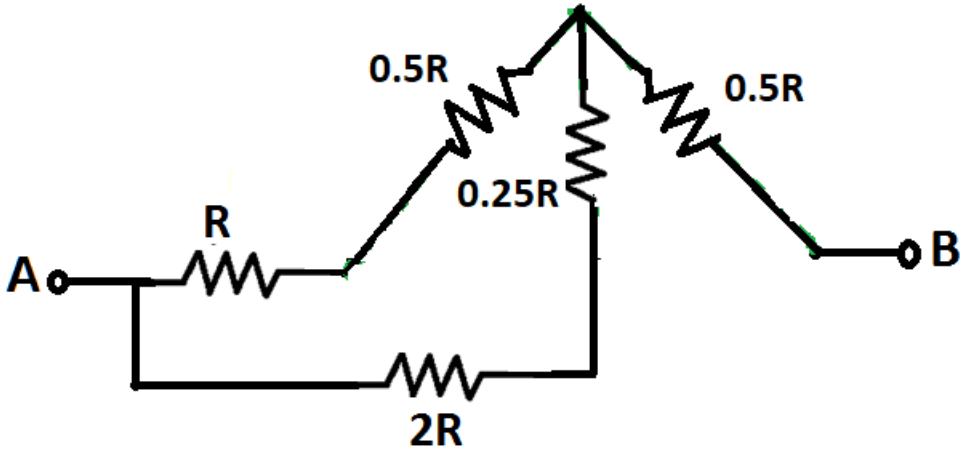
$$X = \frac{R*2R}{(R+2R+R)} = \frac{R}{2}\,\Omega$$

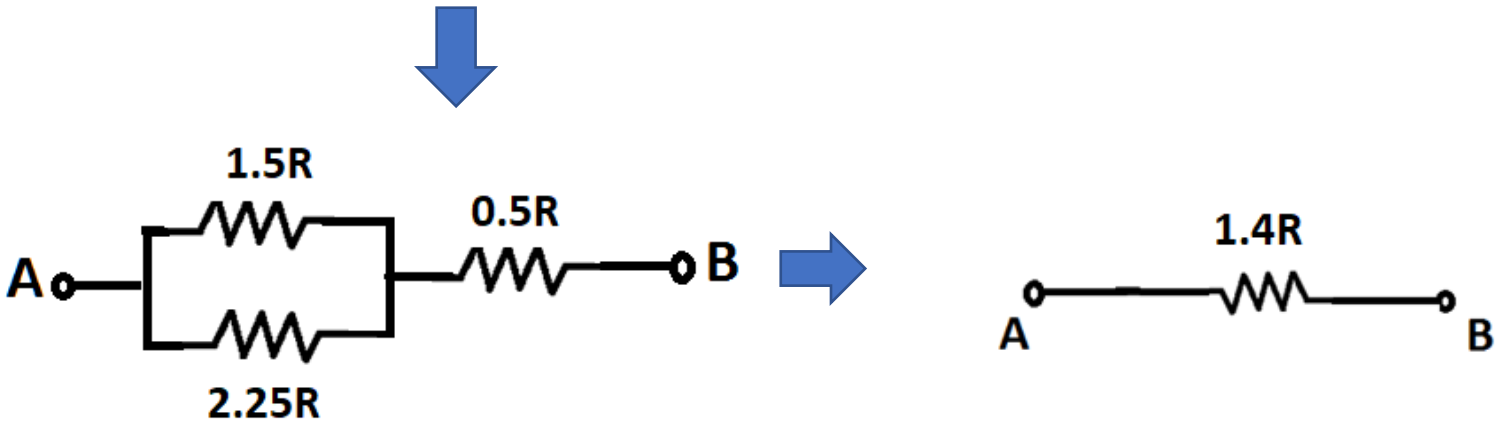
$$Y = \frac{R*R}{(R+2R+R)} = \frac{R}{4}\,\Omega$$

$$Z = \frac{R*2R}{(R+2R+R)} = \frac{R}{2}\,\Omega$$

Star Delta Transformations – Numerical Example 3

Solution (Continued..) :

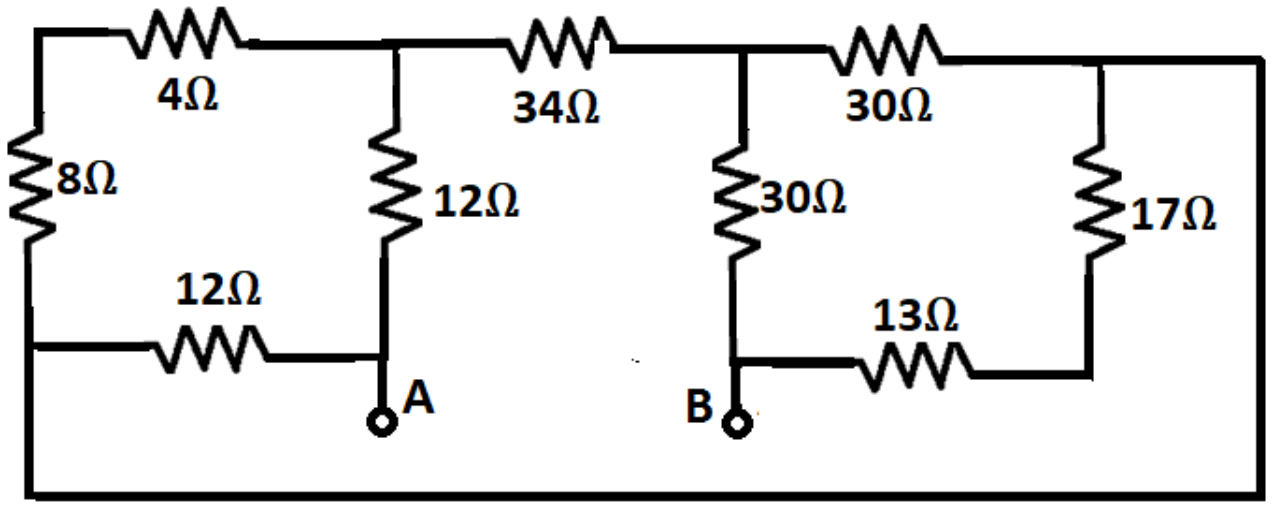




Star Delta Transformations – Numerical Example 4

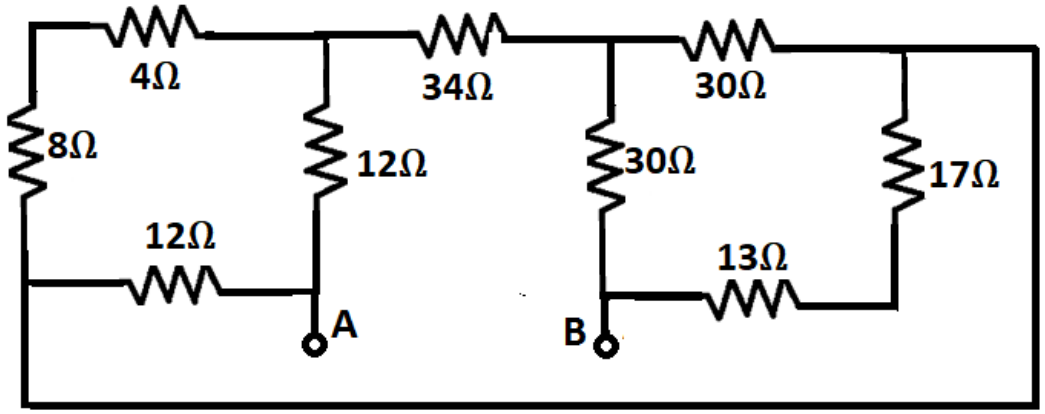
Question:

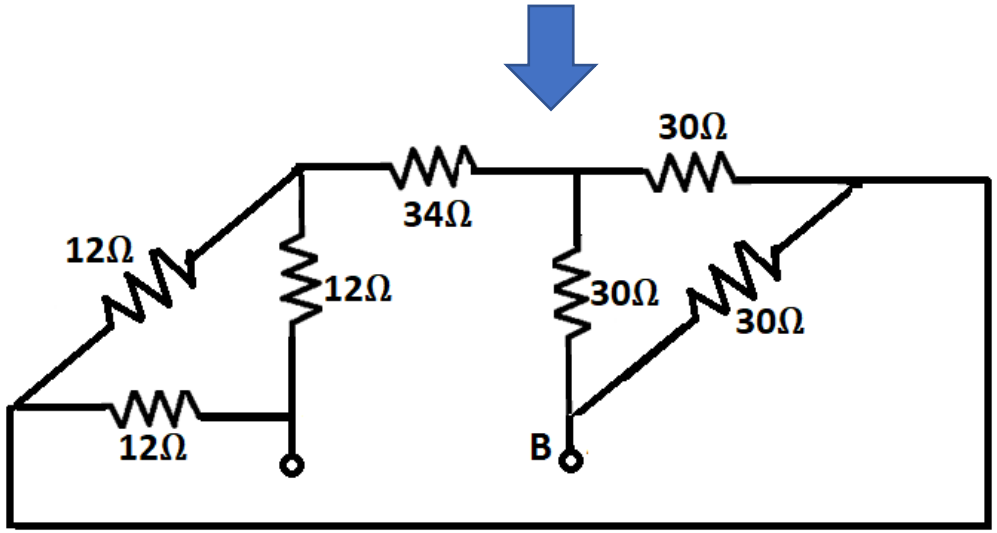
Find the equivalent resistance between the terminals A & B in the network shown.



Star Delta Transformations – Numerical Example 4

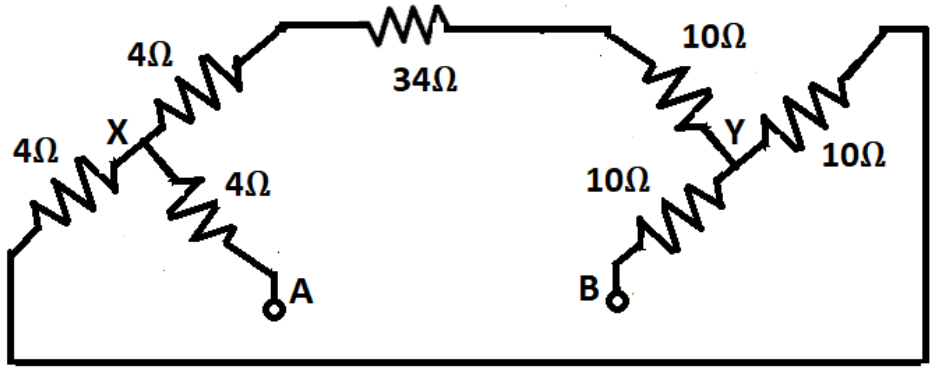
Solution:

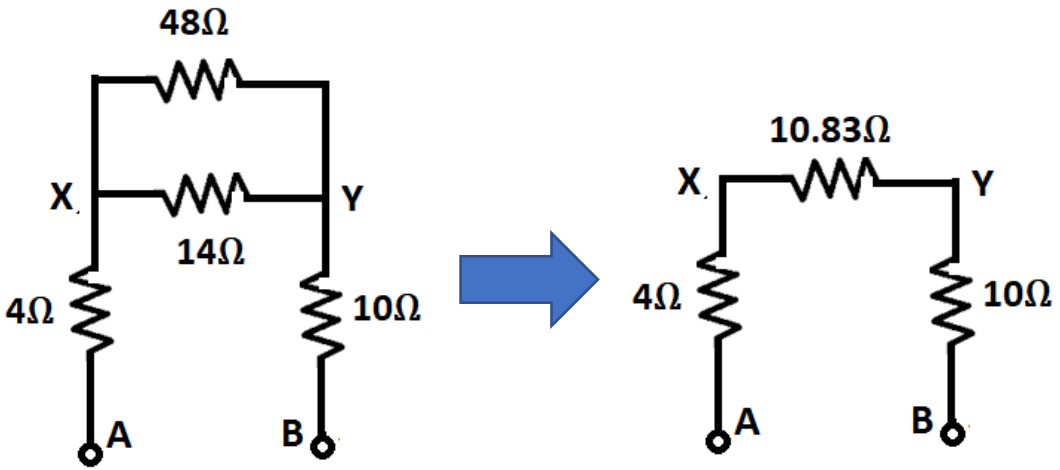




Star Delta Transformations – Numerical Example 4

Solution (Continued..) :



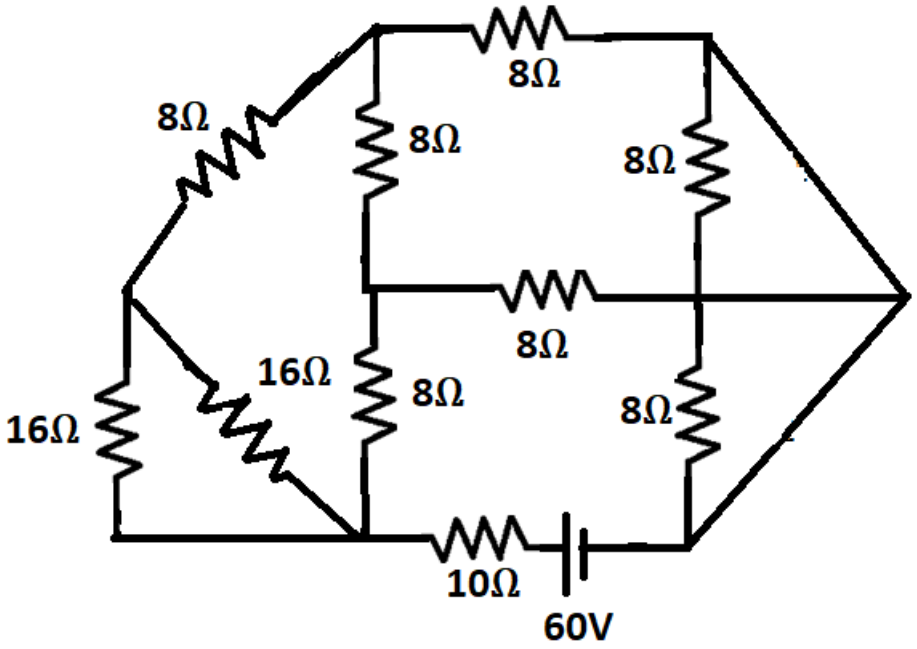


$R_{AB} = 24.83\Omega$

Star Delta Transformations – Numerical Example 5

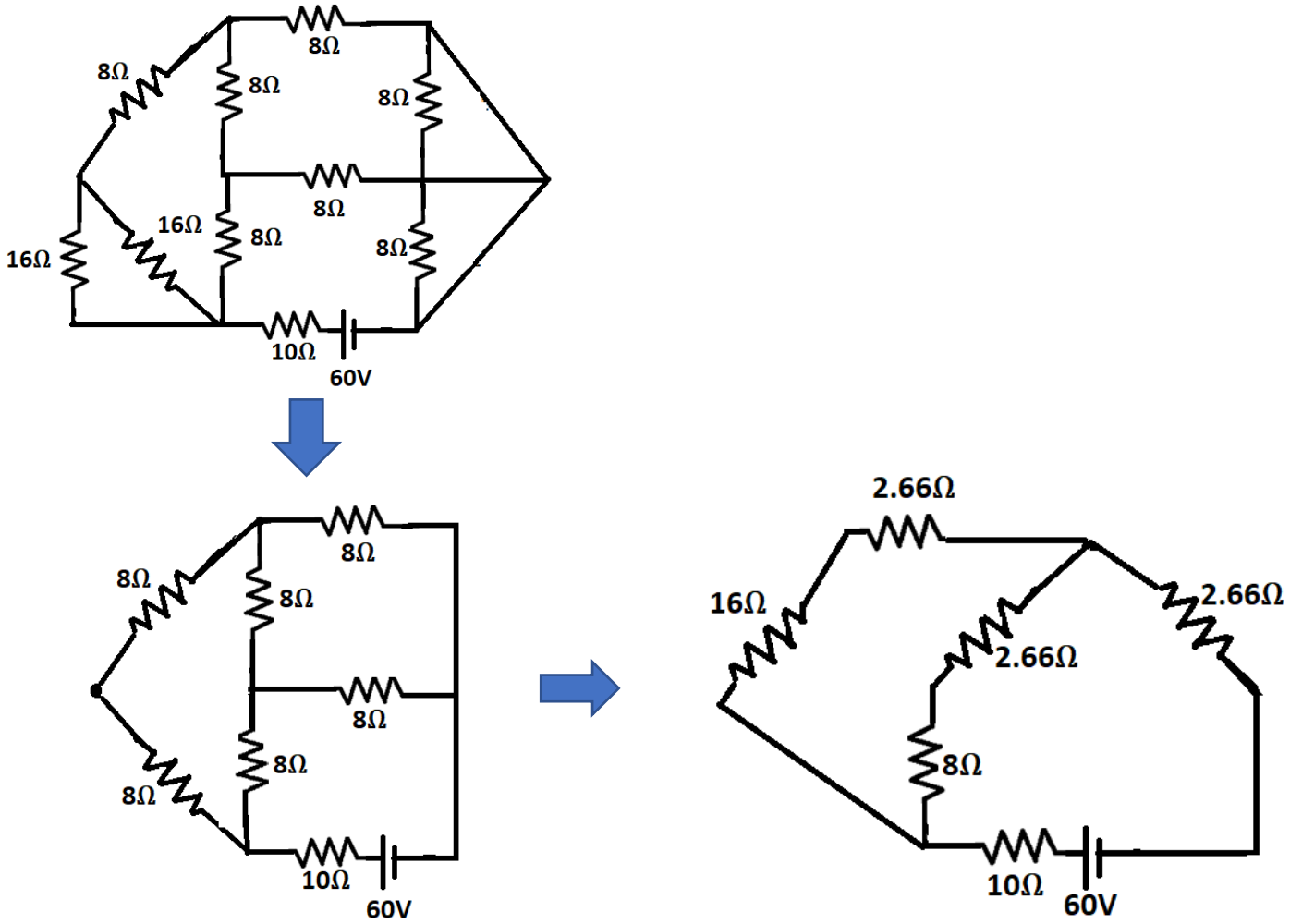
Question:

Find the voltage drop across 10Ω resistor in the network shown.



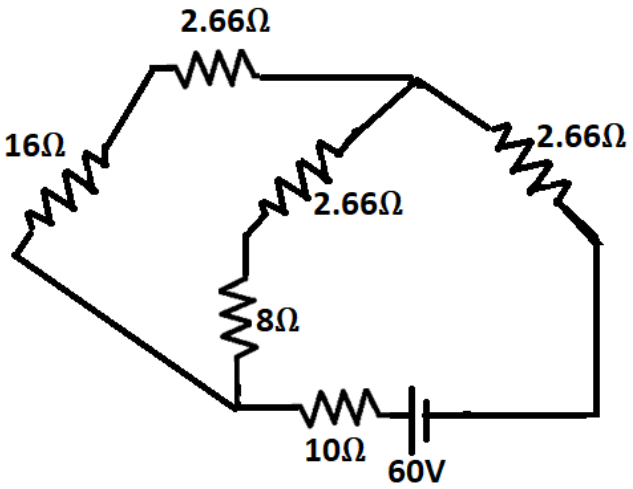
Star Delta Transformations – Numerical Example 5

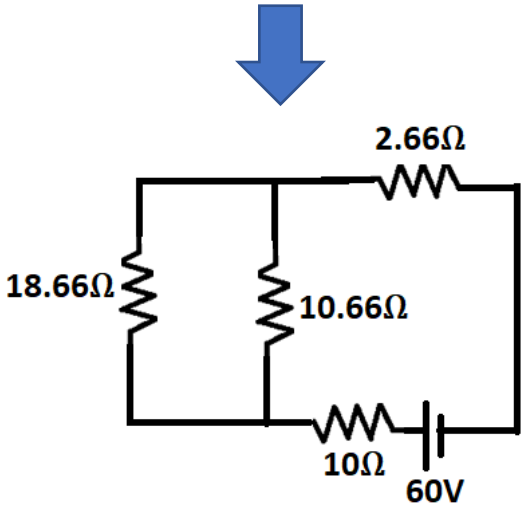
Solution:

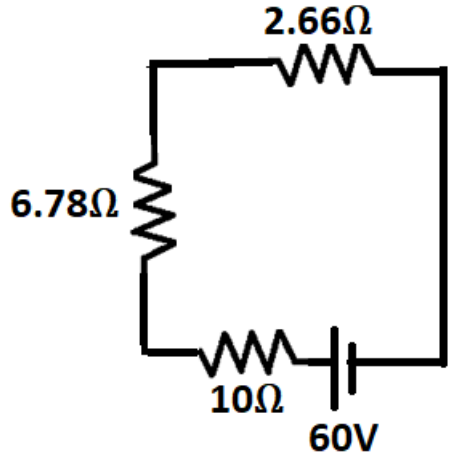


Star Delta Transformations – Numerical Example 5

Solution (Continued..) :

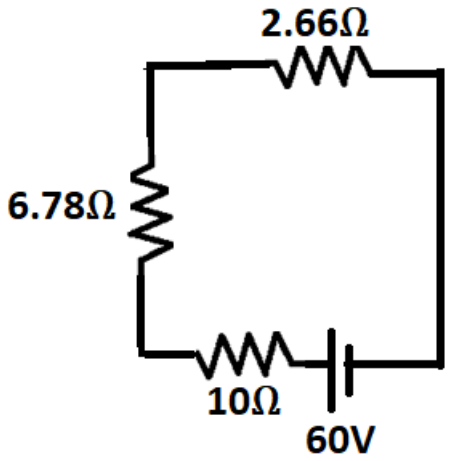






Star Delta Transformations – Numerical Example 5

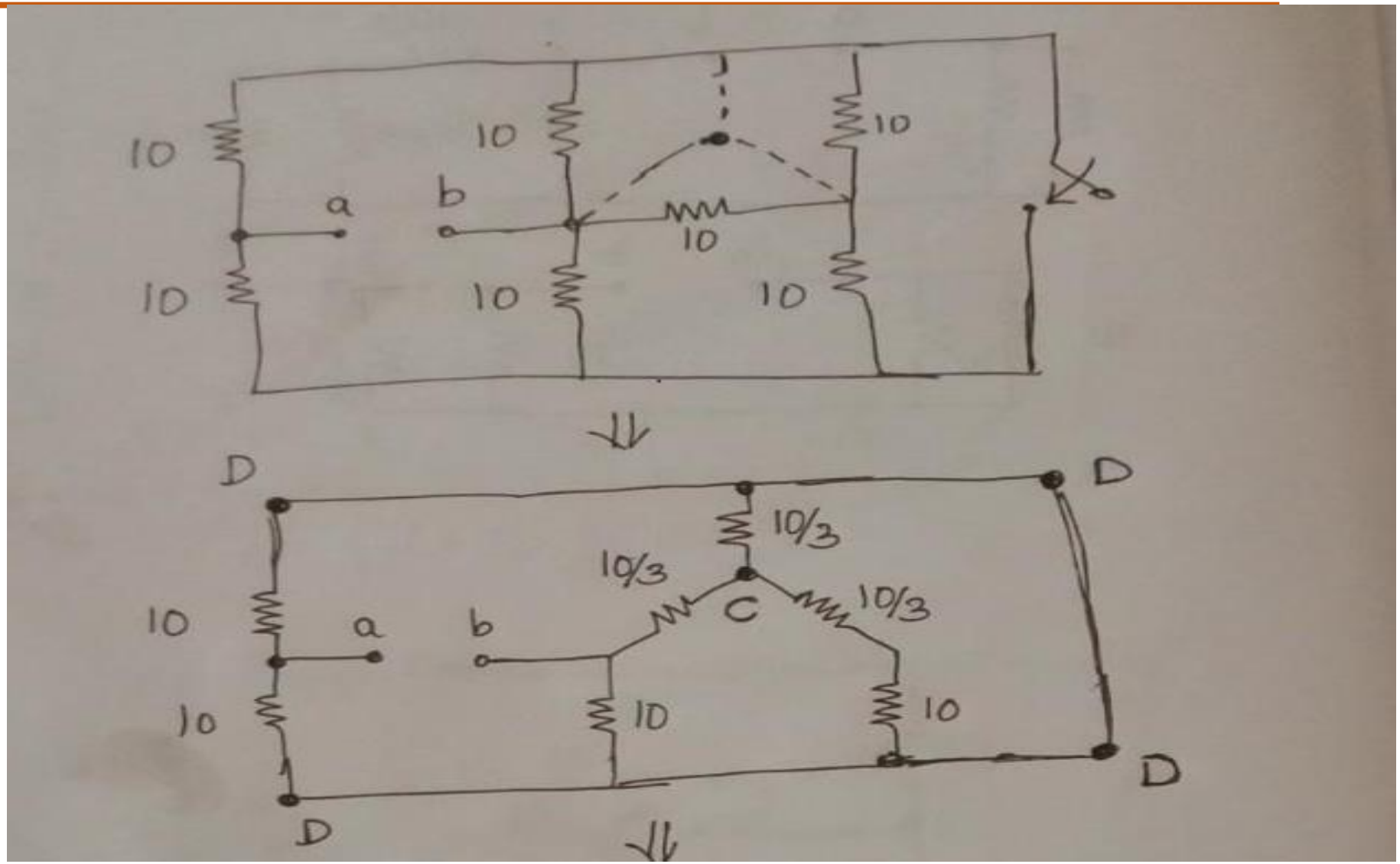
Solution (Continued..) :



Current delivered by 60V source, $I_S = \frac{60}{R_{eq}} = \frac{60}{19.44} = 3.086A$

Voltage drop across 10Ω resistor = I_S*10 = 30.86V

Star Delta Transformations – Numerical Example 5



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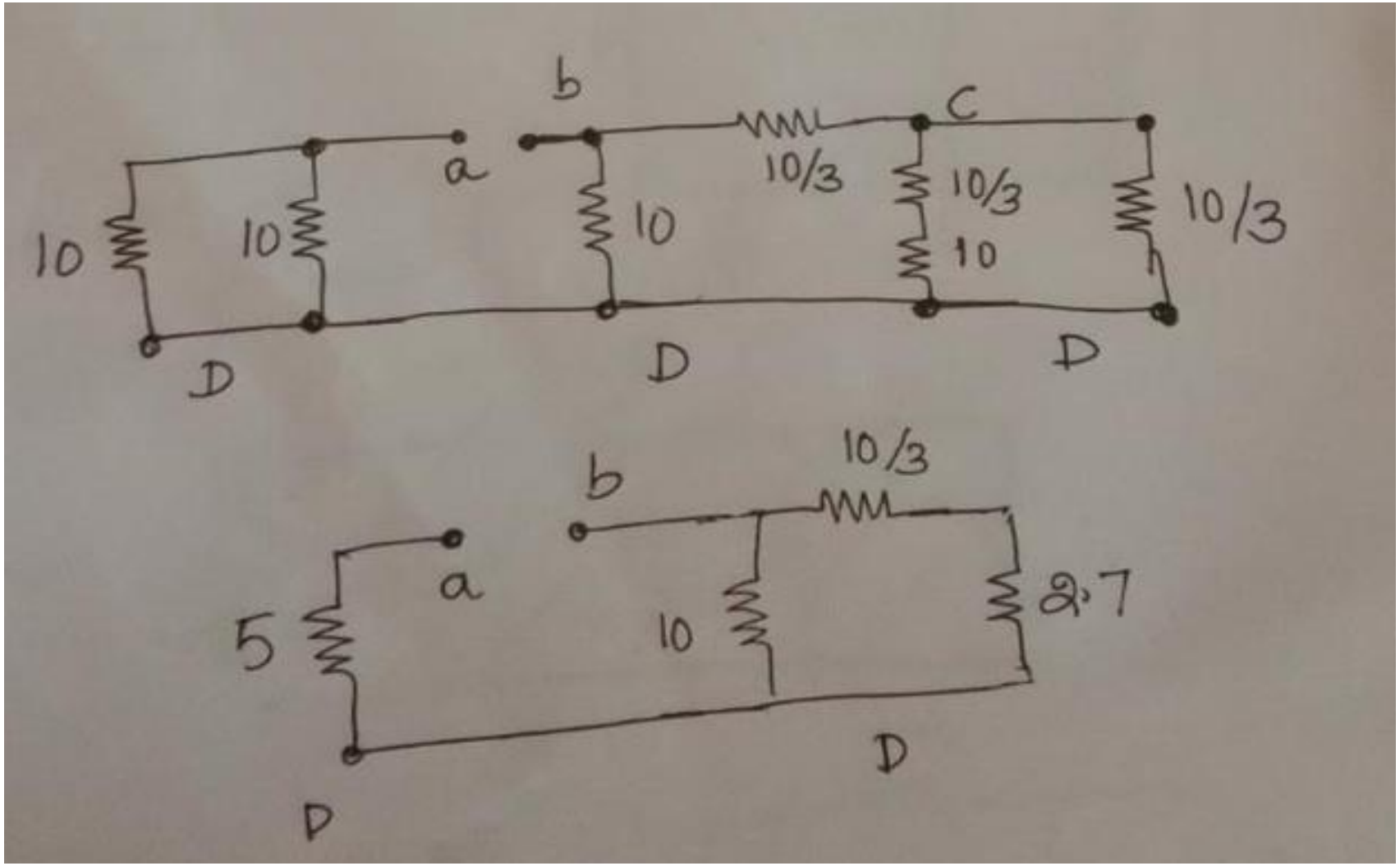
Star Delta Transformations – Numerical Example 5



Text Book & References

Text Book:

"Electrical and Electronic Technology" E. Hughes (Revised by J. Hiley, K. Brown & I.M Smith), 11th Edition, Pearson Education, 2012.

Reference Books:

1. "Basic Electrical Engineering", K Uma Rao, Pearson Education, 2011.
2. "Basic Electrical Engineering - Revised Edition", D. C. Kulshreshta, Tata- McGraw-Hill, 2012.
3. "Engineering Circuit Analysis", William Hayt Jr., Jack E. Kemmerly & Steven M. Durbin, 8th Edition, McGraw-Hill, 2012.

THANK YOU

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