ELEMENTS OF ELECTRICAL ENGINEERING
Course Code : UE25EE141A/B

PES UNIVERSITY

FACULTY CONTRIBUTED:

Department of EEE, RR Campus

Prof . Jyothi T N
Prof. Vadhiraj K P P
Prof. Kruthika N
Prof. Suma S
Prof. Pushpa K R
Prof. Sangeeta Modi

Department of ECE, EC Campus

Prof. Lokesh L
Prof. Dhanashree G Bhate
Dr. Renuka R Kajur
Prof. Rajesh Chandrashekar
Prof. Sangam Kumar G H

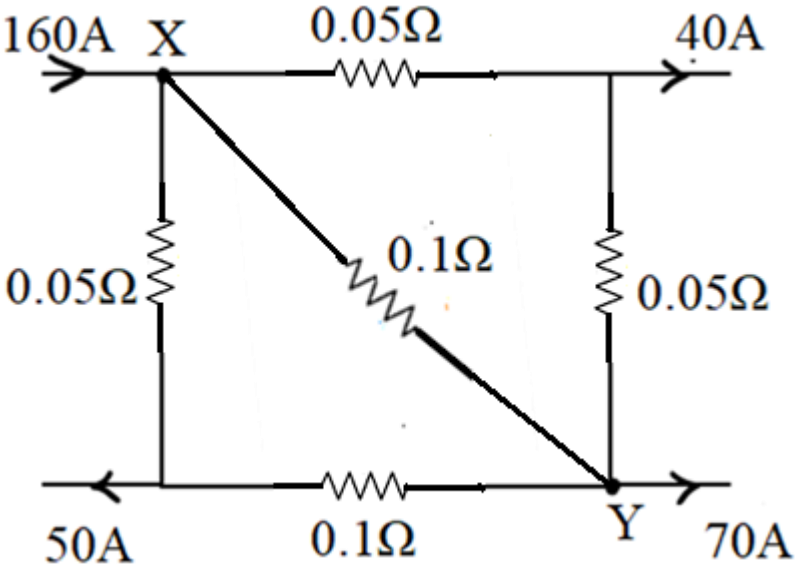
ELEMENTS OF ELECTRICAL ENGINEERING

Numerical Examples – Basic Laws , VDR , CDR

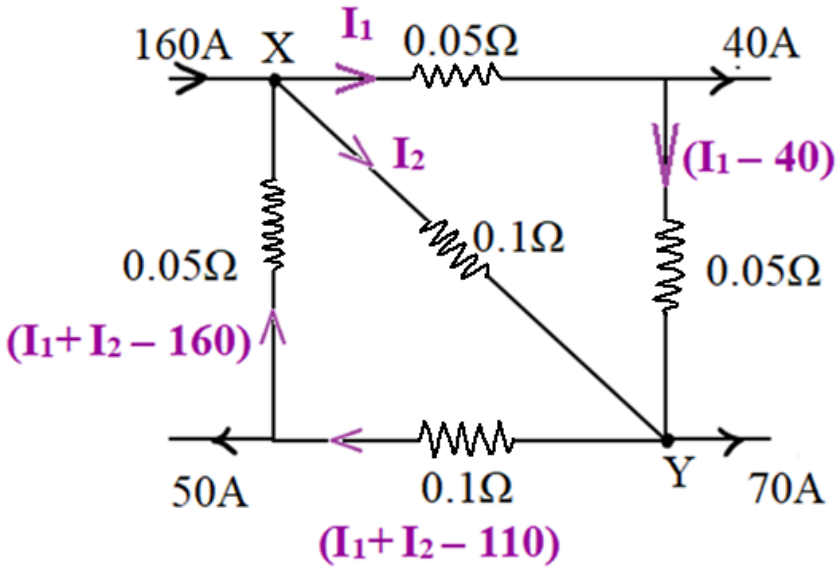
Jyothi T N
Department of Electrical & Electronics Engineering

Numerical Example on KCL

By using Kirchhoff's laws, Find current in branch XY for the given circuit.



Solution:

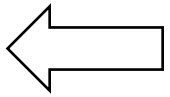


$-0.05\ I_1 - 0.05(I_1 - 40) + 0.1\ I_2 = 0$

$0.1\ I_1 - 0.1\ I_2 = 2$ ------1

$-0.1\ I_2 - 0.1(I_1 + I_2 - 110) - 0.05(I_1 + I_2 - 160) = 0$

$0.15\ I_1 + 0.25\ I_2 = 19$ ------2



Solving equation 1 & 2

$I_1 = 60A$; $I_2 = I_{XY} = 40A$

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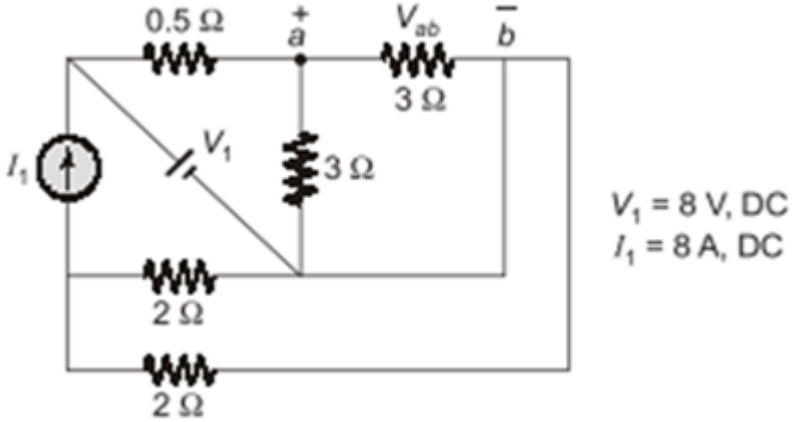
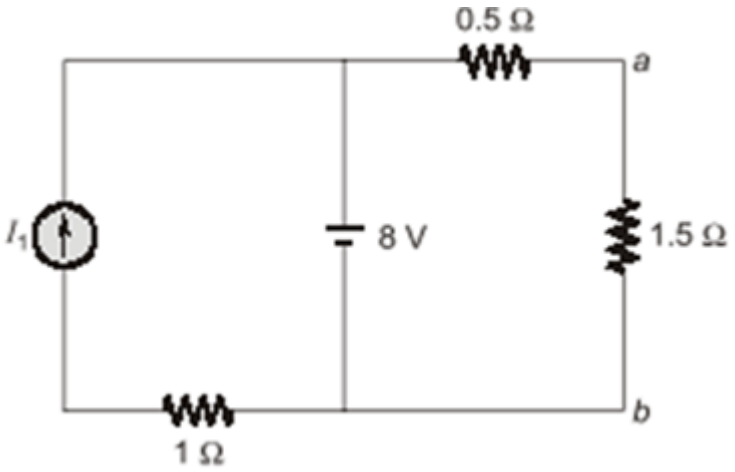
Numerical Example on KVL

For the circuit shown below, V_1=8V and I_1=8A. Find the voltage V_{ab}



V_1 = 8 V, DC
I_1 = 8 A, DC

Solution: circuit can be redrawn as

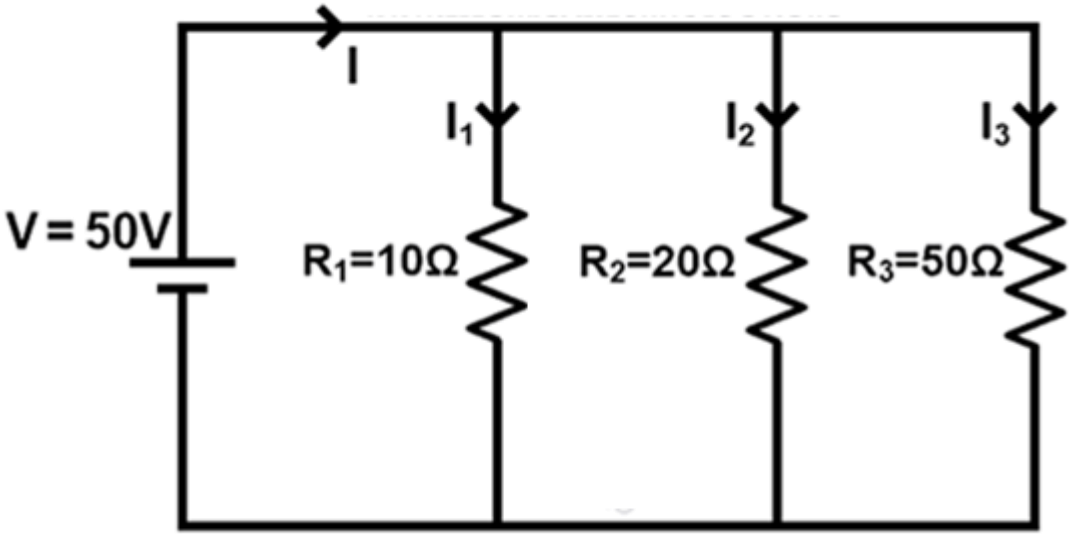


By applying voltage division rule, we can get

$$V_{ab} = 8 \times \frac{1.5}{1.5 + 0.5} = 6 \text{ V}$$

Class Work

Find the current passes through each resistor by the current divider rule for the given network.



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Text Book & References

Text Book:

1. "Basic Electrical Engineering" S.K Bhattacharya, 1st Edition Pearson India Education Services Pvt. Ltd., 2017
2. "Basic Electrical Engineering", D. C. Kulshreshta, 2nd Edition, McGraw-Hill. 2019
3. "Special Electrical Machines" E G Janardanan, PHI Learning Pvt. Ltd., 2014

Reference Books:

1. "Engineering Circuit Analysis" William Hayt, Jack Kemmerly, Jamie Phillips and Steven Durbin, 10th Edition McGraw Hill, 2023

2. "Electrical and Electronic Technology" E. Hughes (Revised by J. Hiley, K. Brown & I.M Smith), 12th Edition, Pearson Education, 2016.

THANK YOU

Jyothi T N

Department of Electrical & Electronics Engineering

jyothitn@pes.edu