ELEMENTS OF ELECTRICAL ENGINEERING
Course Code : UE25EE141A/B

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ELEMENTS OF ELECTRICAL ENGINEERING

Concept Of Short Circuit, Open Circuit And Numerical
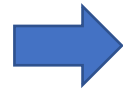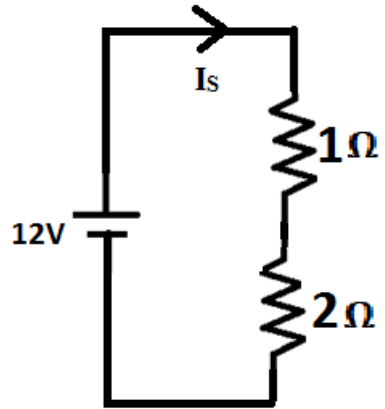
Jyothi T N

Department of Electrical & Electronics Engineering

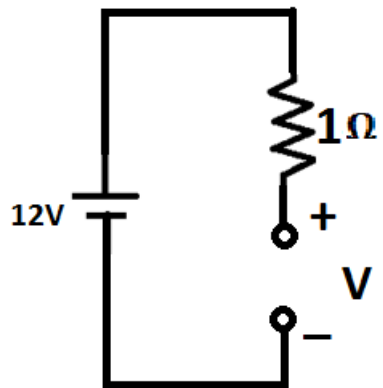An Open Circuit has Infinite resistance.

Current through the Open Circuit is Zero.

Voltage across the Open Circuit can be any finite value.

Open Circuit

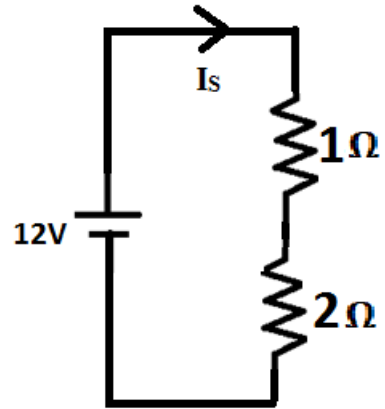$I_S = 4A$

$I_S = 0A$
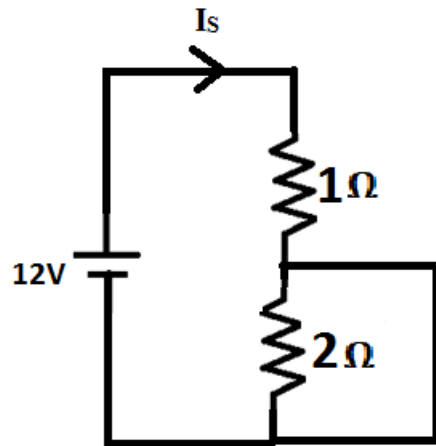$V = 12V$

A Short Circuit has Zero resistance.

Voltage across a Short Circuit is Zero.

Current through the Short Circuit can be any finite value.

Current through a Dead Short Circuit is dangerously high.
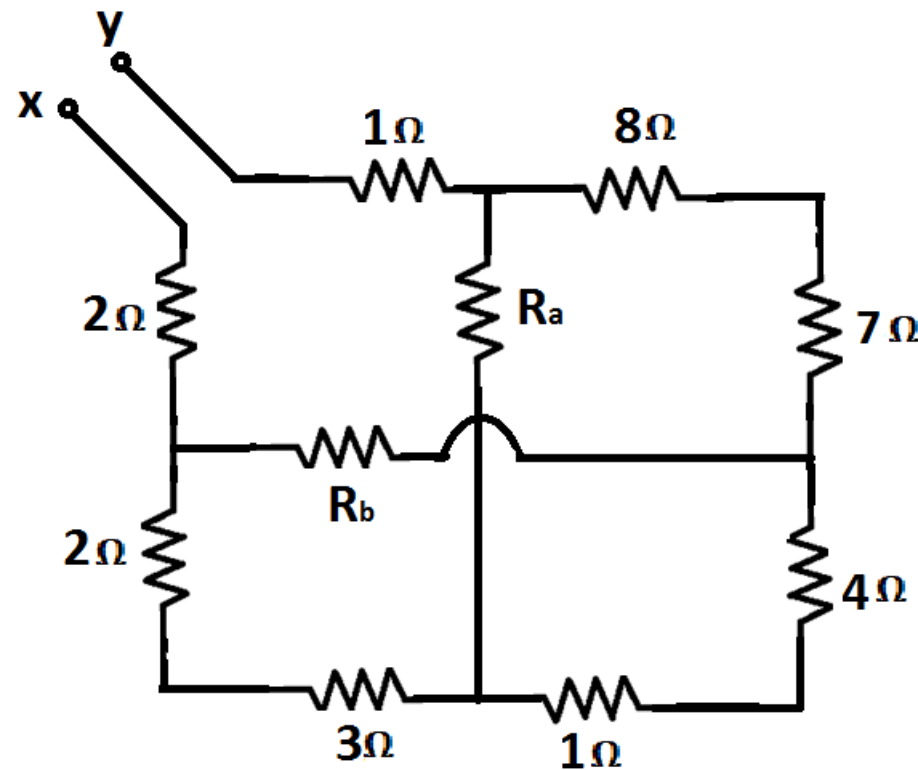
$I_S = 4A$

$I_S = 12A$

Find the equivalent resistance between X & Y if

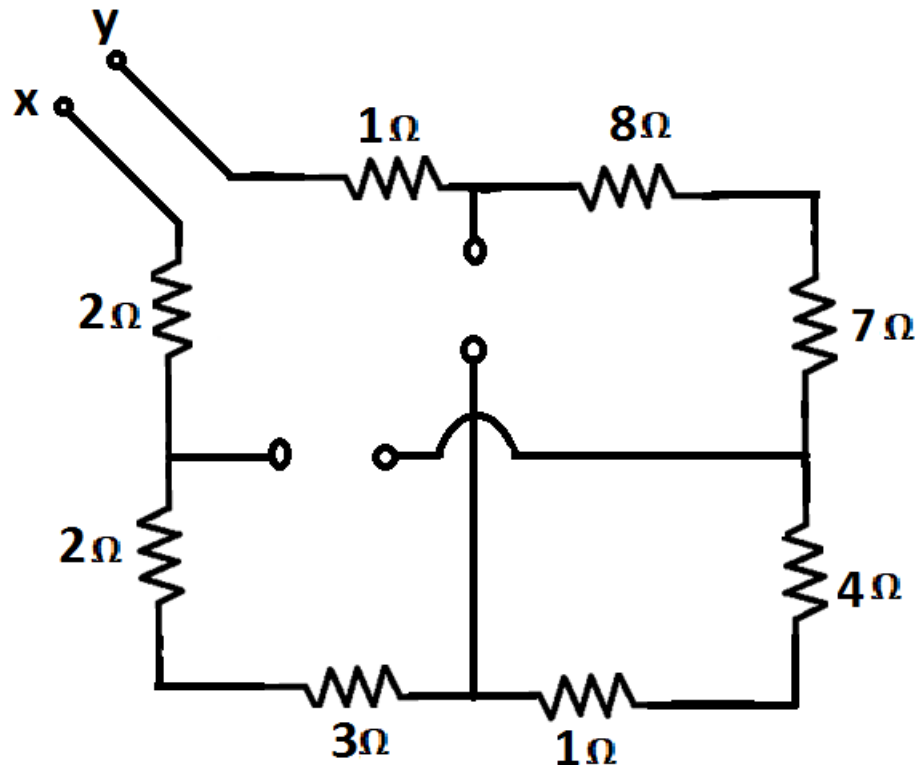i) $R_a = \infty$ & $R_b = \infty$

ii) $R_a = 0$ & $R_b = \infty$

iii) $R_a = \infty$ & $R_b = 0$

iv) $R_a = 0$ & $R_b = 0$
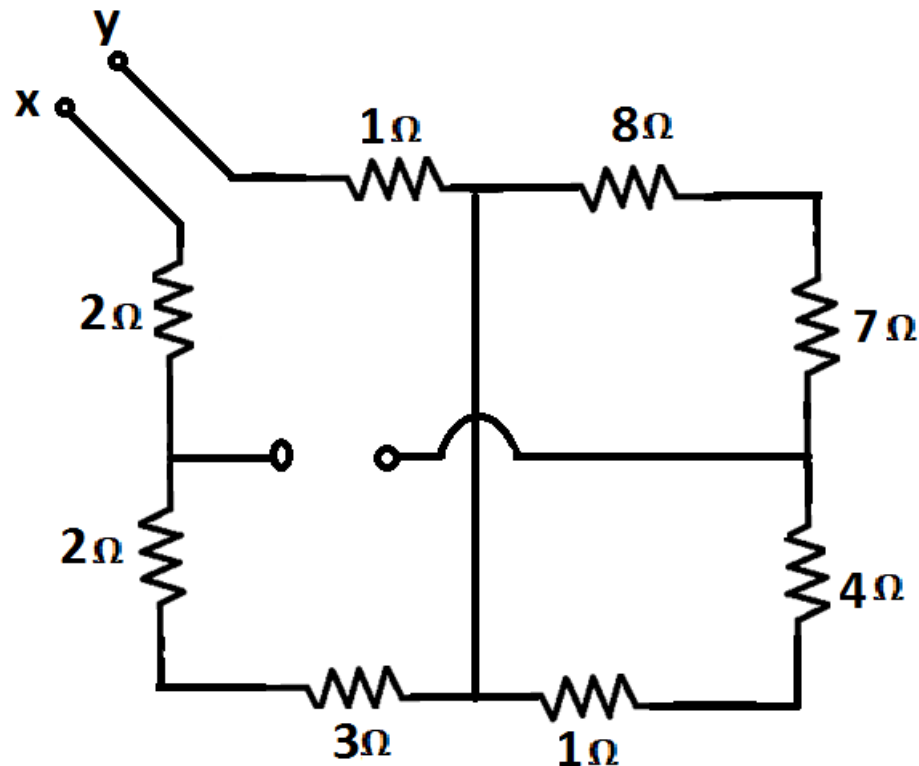
Solution:

Case i) $R_a = \infty$ & $R_b = \infty$

All the resistors are in series.

Hence, $R_{XY} = 28\Omega$
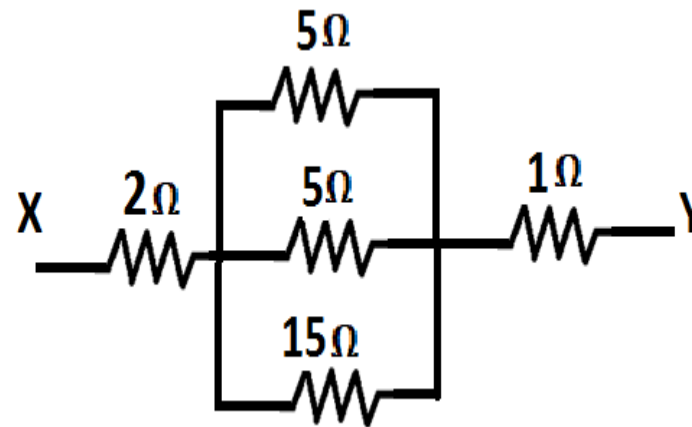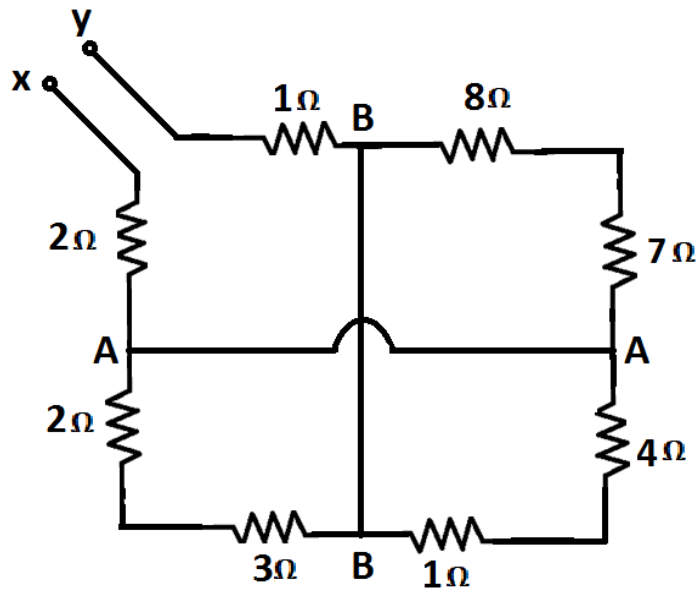
Solution:

Case ii) $R_a = 0$ & $R_b = \infty$

$R_{XY} = 8\Omega$

Solution:

Case iv) $R_a = 0$ & $R_b = 0$

$$R_{XY} = 5.143\Omega$$

Text Book:

1. "Basic Electrical Engineering" S.K Bhattacharya, 1^{st}Edition Pearson India Education Services Pvt. Ltd., 2017

2. "Basic Electrical Engineering", D. C. Kulshreshta, 2^{nd}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

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