



UNIVERSITY OF HILLA
College of Engineering Technologies
Department of Medical Devices Technologies

Fundamental of Electrical Engineering(DC)
Source Conversion

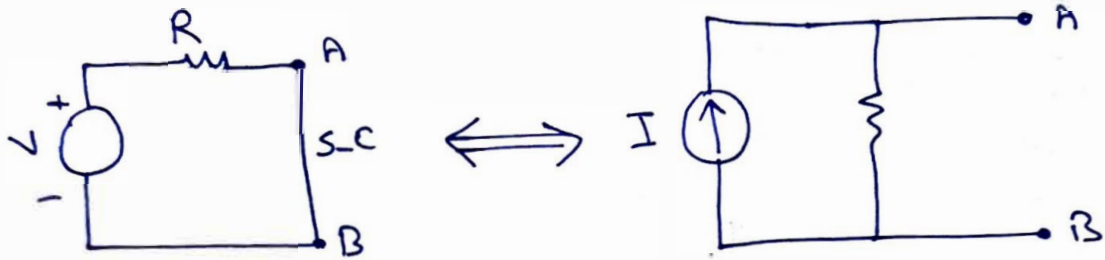
Asst. Lect. Morteza Abbas Imran

First Stage

Lecture 4

Source Conversion

a given Voltage Source with a Series Resistance can be converted into (or replaced by) equivalent Current Source with a Parallel Resistance, and vice versa.

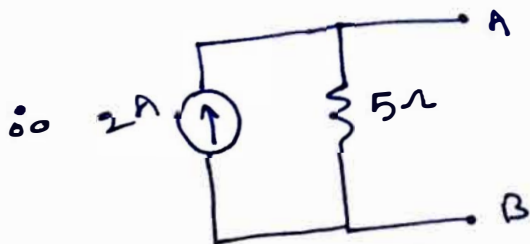
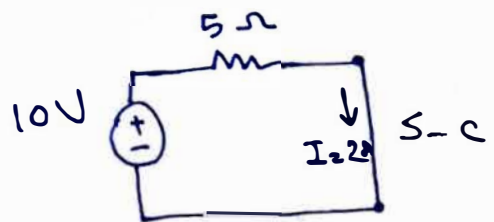


Ex:- Convert the Voltage Source into an equivalent Current Source

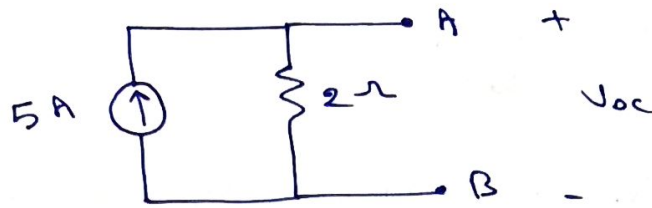


Sol:- current obtained by putting a short circuit across terminals A and B

$$I = \frac{V}{R} = \frac{10}{5} = 2A$$

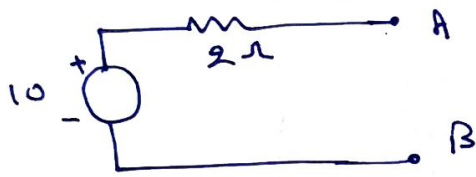


Ex:- Find the equivalent Voltage Source for the current source in the circuit shown below:-

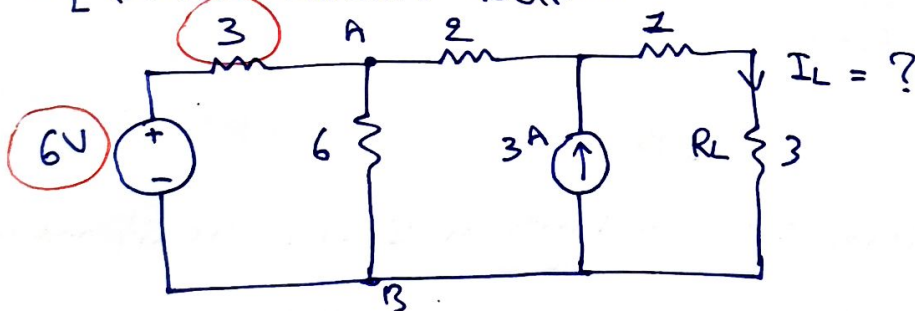


Sol/ The open circuit Voltage across terminals A and B is

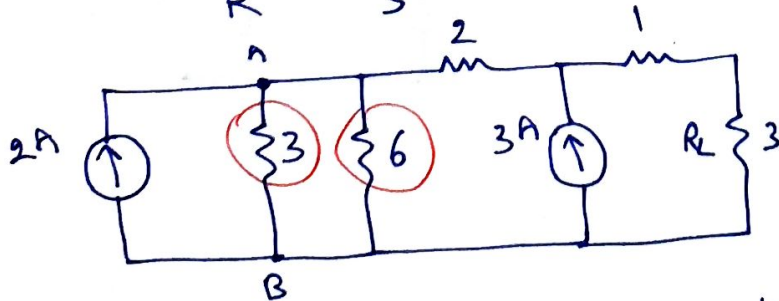
$$V_{oc} = IR = 5 \times 2 = 10 \text{ V}$$



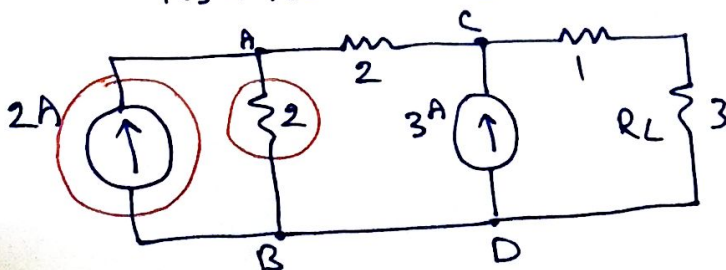
Ex:- Use Source Conversion technique to find the load current I_L in the circuit below:-



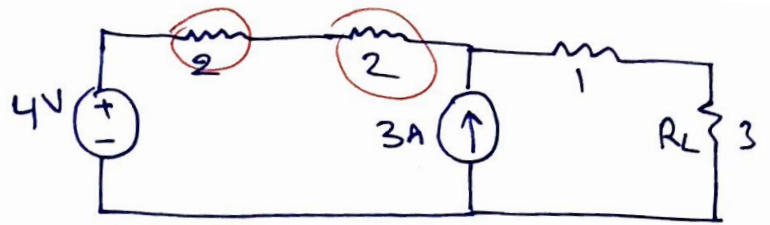
Sol/ $I = \frac{V}{R} = \frac{6}{3} = 2 \text{ A}$



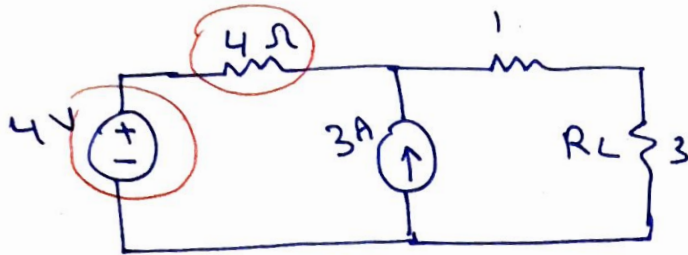
$$R_{36} = \frac{R_3 R_6}{R_3 + R_6} = \frac{3 \times 6}{3 + 6} = \frac{18}{9} = 2 \Omega$$



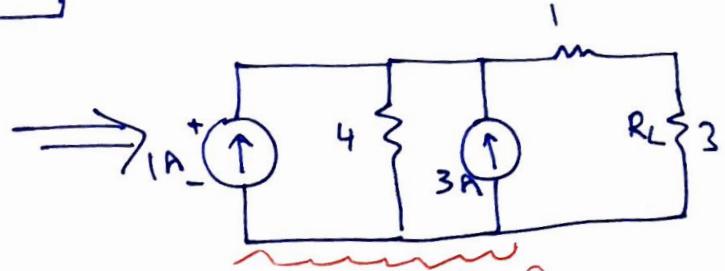
$$V = IR = 2 \times 2 = 4V$$



$$R_{22} = 2 + 2 = 4 \Omega$$

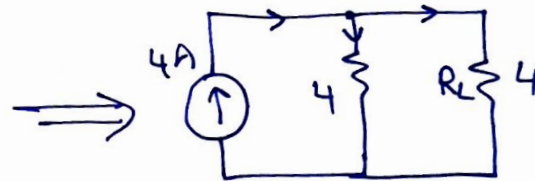
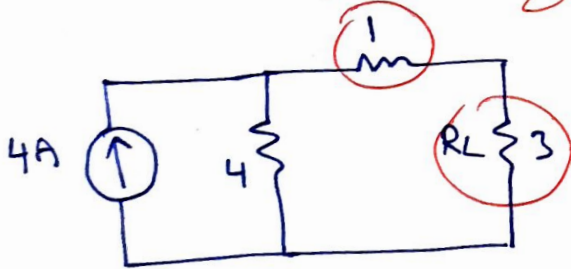


$$I = \frac{V}{R} = \frac{4}{4} = 1 \text{ A}$$



این را بنویس

قصار السيار - مربوط - على التوازي فتجمع المصادر



The current source is divided into two equal parts because each of the two parallel paths has a resistance 4Ω

$$\therefore I_L = 2A$$