Series-Parallel DC Circuit

By Ariful Islam
Dept. of EEE
University of Dhaka

Reduce and Return Approach

EXAMPLE 1 Find current I_3 for the series-parallel network in Fig. 3.

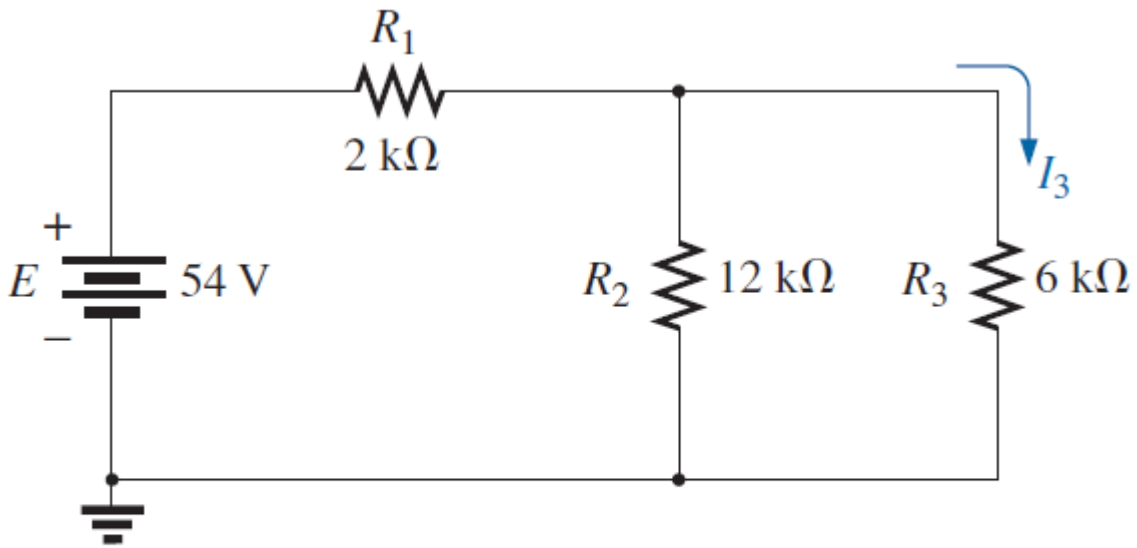


FIG. 3
Series-parallel network for Example 1.

Reduce and Return Approach

EXAMPLE 2 For the network in Fig. 5:

a. Determine currents I_4 and I_s and voltage V_2.
b. Insert the meters to measure current I_4 and voltage V_2.

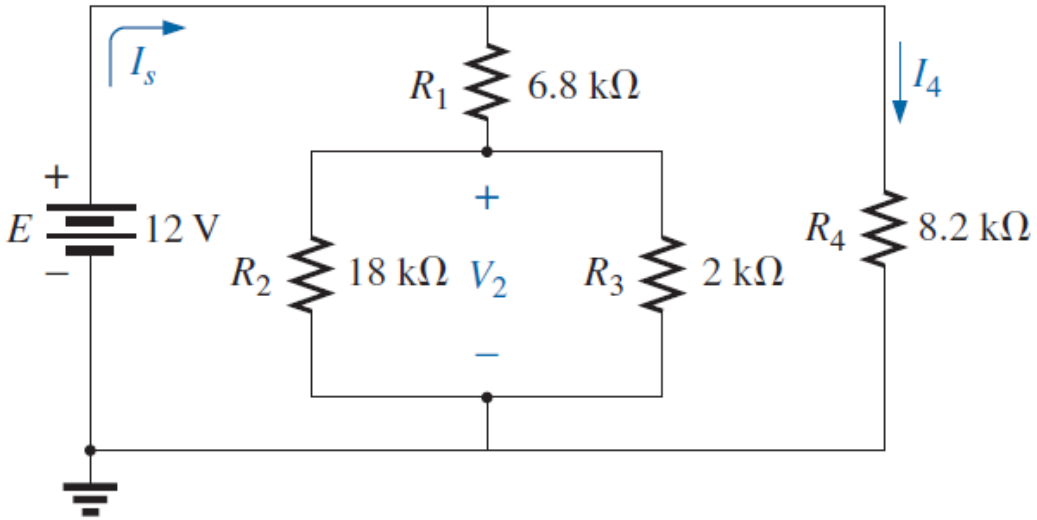


FIG. 5
Series-parallel network for Example 2.

$V_2 = 2.5$ V

$V_2 = 2.48$ V

Block Diagram Approach

EXAMPLE 3 Determine all the currents and voltages of the network in Fig. 10.

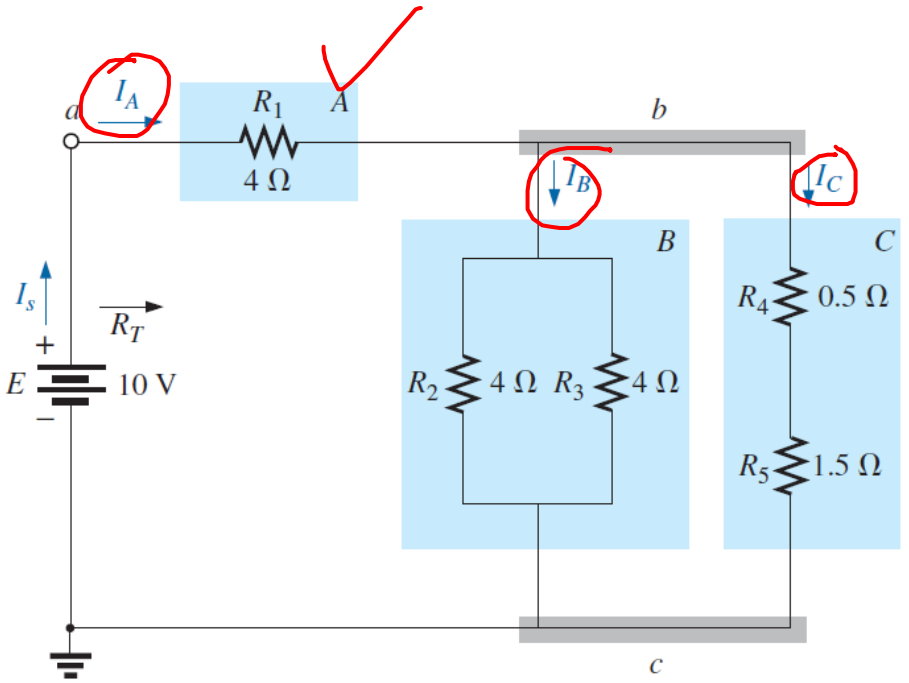
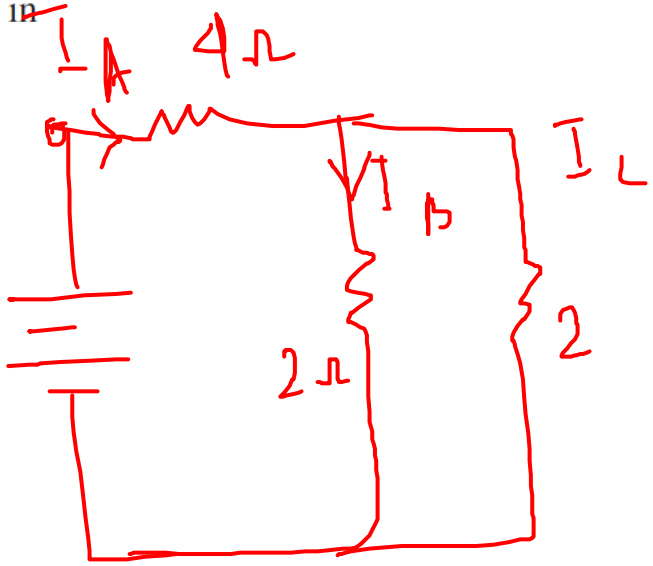


FIG. 10
Example 3.



Block Diagram Approach

EXAMPLE 4 Another possible variation of Fig. 8 appears in Fig. 12. Determine all the currents and voltages.

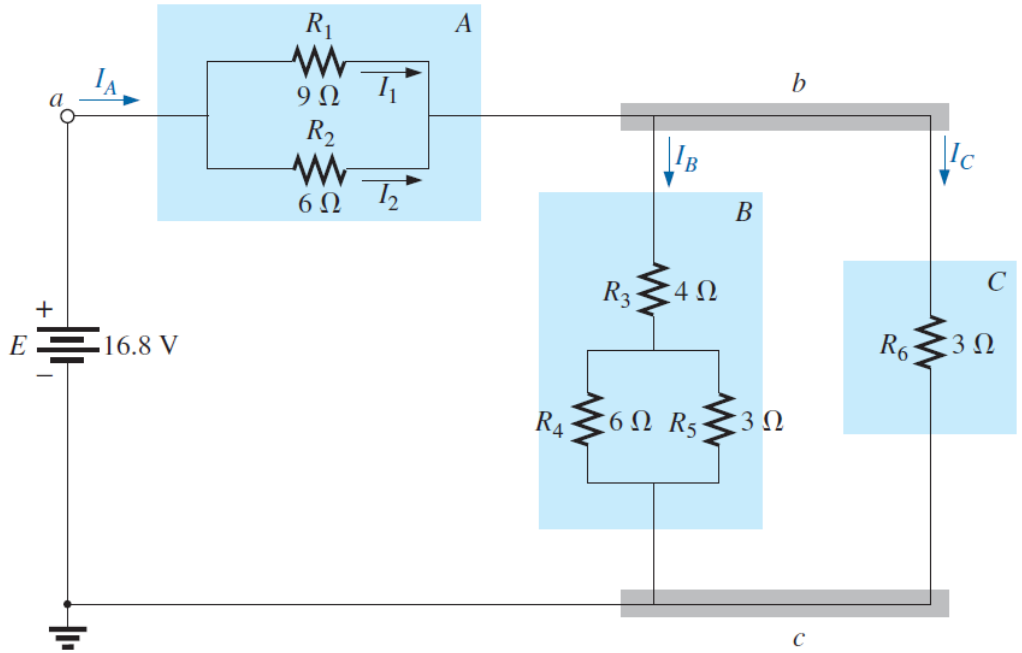


FIG. 12
Example 4.

Block Diagram Approach

EXAMPLE 6 Find the indicated currents and voltages for the network in Fig. 17.

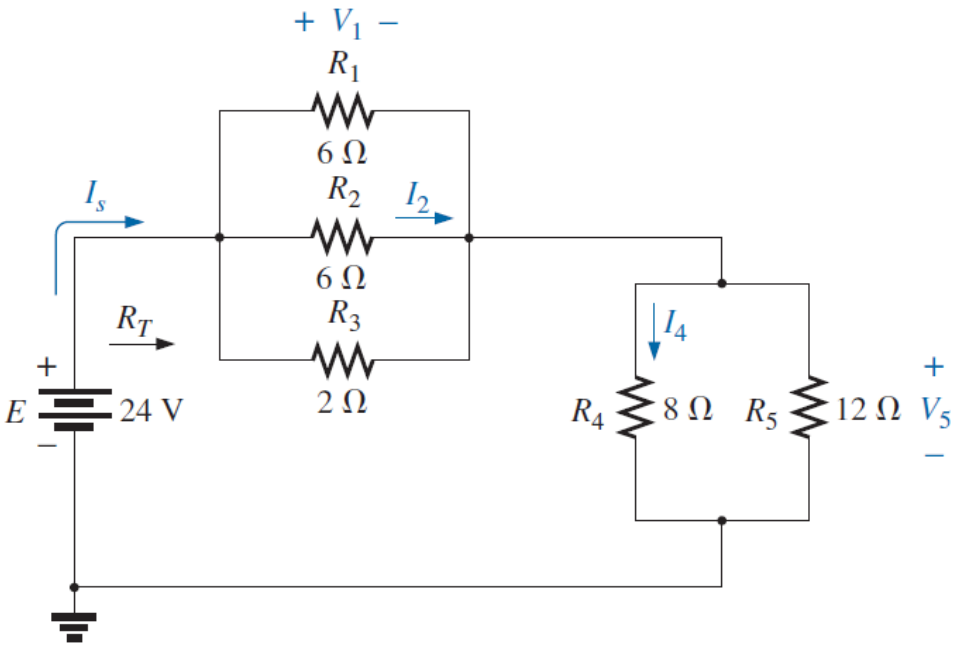


FIG. 17
Example 6.

Block Diagram Approach

EXAMPLE 7

a. Find the voltages V_1, V_3, and V_{ab} for the network in Fig. 20.
b. Calculate the source current I_s.

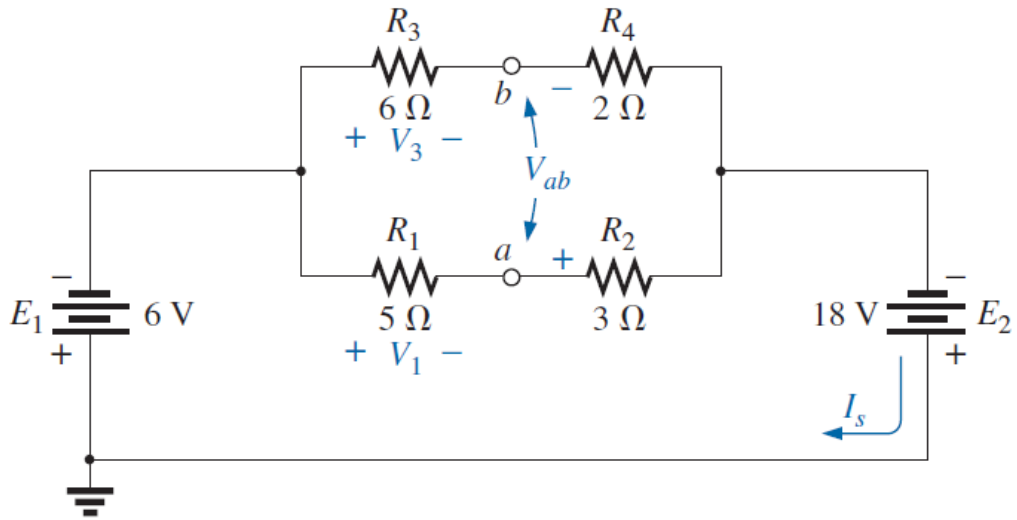


FIG. 20
Example 7.

Block Diagram Approach

EXAMPLE 10 Calculate the indicated currents and voltage in Fig. 26.

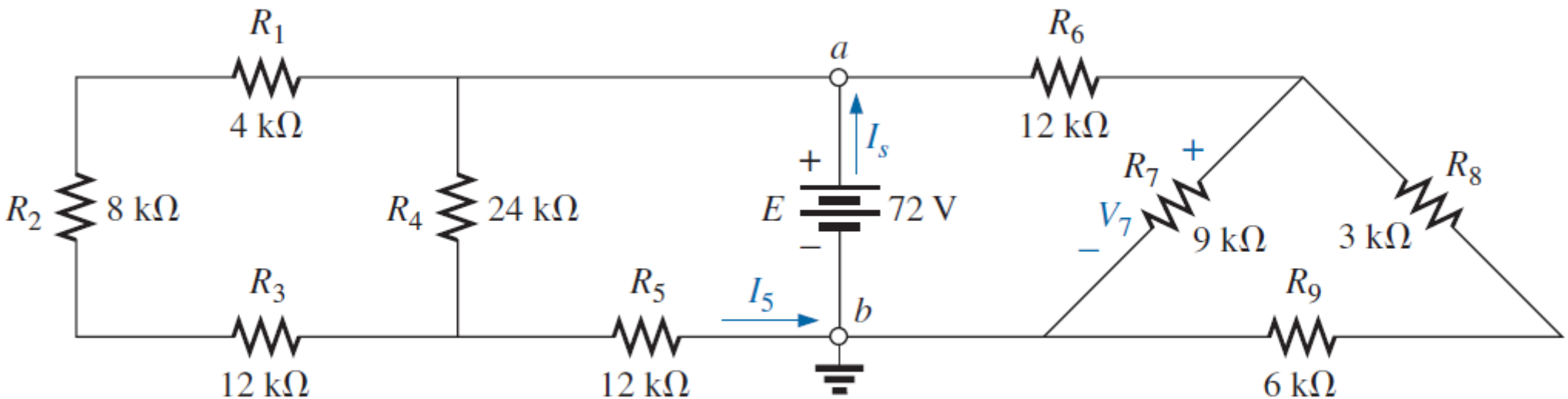


FIG. 26
Example 10.

LADDER NETWORKS

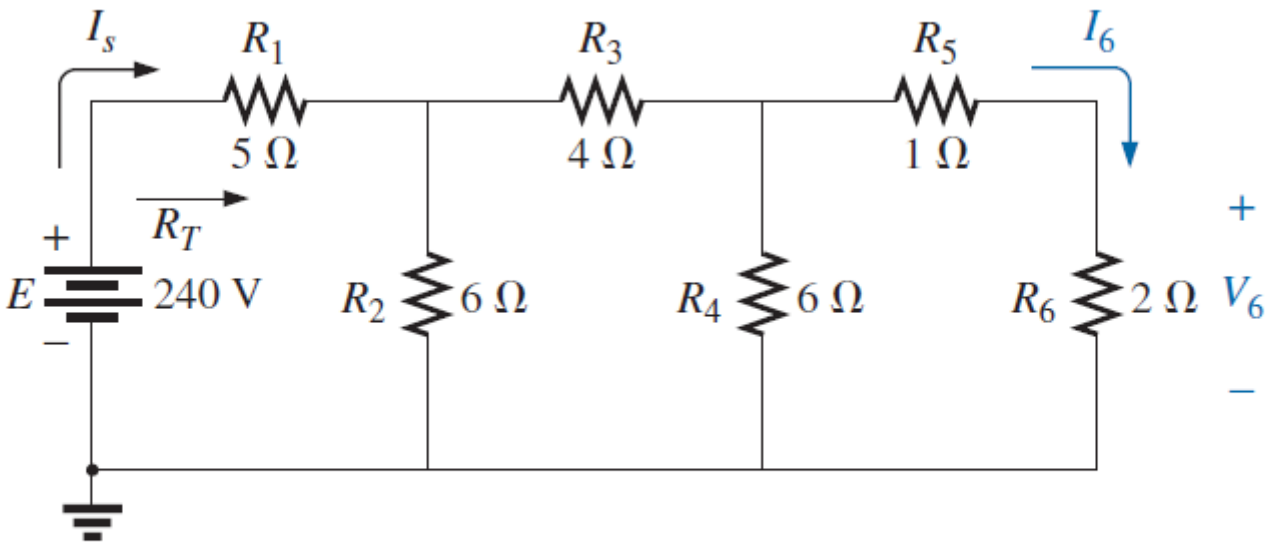


FIG. 32
Ladder network.