**Steps to solve circuits using Superposition**

**Step 1 –** Take only one independent source of voltage or current and deactivate the other source.

**Step 2 –** In the circuit diagram B shown above, consider the source E1 and replace the other source E2 by its internal resistance. If its internal resistance is not given, then it is taken as zero and the source is short circuited.

**Step 3 –** If there is a voltage source than short circuit it and if there is a current source than just open circuit it.

**Step 4 –** Thus, by activating one source and deactivating the other source find the current in each branch of the network. Taking above example find the current I1’, I2’and I3’.

**Step 5 –** Now consider the other source E2 and replace the source E1 by its internal resistance r1 as shown in the circuit diagram C.

**Step 6 –** Determine the current in various sections, I1’’, I2’’ and I3’’.

**Step 7 –** Now to determine the net branch current utilizing the superposition theorem, add the currents obtained from each individual source for each branch.

**Step 8 –** If the current obtained by each branch is in the same direction than add them and if it is in the opposite direction, subtract them to obtain the net current in each branch.

## Steps for Solving Thevenin’s Theorem

**Step 1 –** First of all remove the load resistance **rL** of the given circuit.

**Step 2 –** Replace all the impedance source by their internal resistance.

**Step 3 –** If sources are ideal then short circuit the voltage source and open the current source.

**Step 4 –** Now find the equivalent resistance at the load terminals know as Thevenin’s Resistance (RTH).

**Step 5 –** Draw the Thevenin’s equivalent circuit by connecting the load resistance and after that determine the desired response.

## Steps for Solving a Network Utilizing Norton’s Theorem

**Step 1 –** Remove the load resistance of the circuit.

**Step 2 –** Find the internal resistance Rint of the source network by deactivating the constant sources.

**Step 3 –** Now short the load terminals and find the short circuit current ISC flowing through the shorted load terminals using conventional network analysis methods.

**Step 4 –** Norton’s equivalent circuit is drawn by keeping the internal resistance Rint in parallel with the short circuit current ISC.

**Step 5 –** Reconnect the load resistance RL of the circuit across the load terminals and find the current through it known as load current IL.

**Steps for Solving a Network Utilizing Reciprocity Theorem**

**Step 1 –** Firstly, select the branches between which reciprocity has to be established.

**Step 2 –** The current in the branch is obtained using any conventional network analysis method.

**Step 3 –** The voltage source is interchanged between the branch which is selected.

**Step 4 –** The current in the branch where the voltage source was existing earlier is calculated.

**Step 5 –** Now, it is seen that the current obtained in the previous connection, i.e., in step 2 and the current which is calculated when the source is interchanged, i.e., in step 4 are identical to each other.