

Superposition Theory

- Whenever a linear system is excited, or driven, by more than one independent source of energy, the total response is the sum of the individual responses.
- An individual response is the result of an independent source acting alone.
- Because we are dealing with circuits made up of interconnected linear-circuit elements, we can apply the principle of superposition directly to the analysis of such circuits when they are driven by more than one independent energy source

Memristive systems

➤ The superposition principle states that the voltage across (or current through) an element in a linear circuit is the algebraic sum of the voltage across (or current through) that element due to each independent source acting alone.

Step to apply:

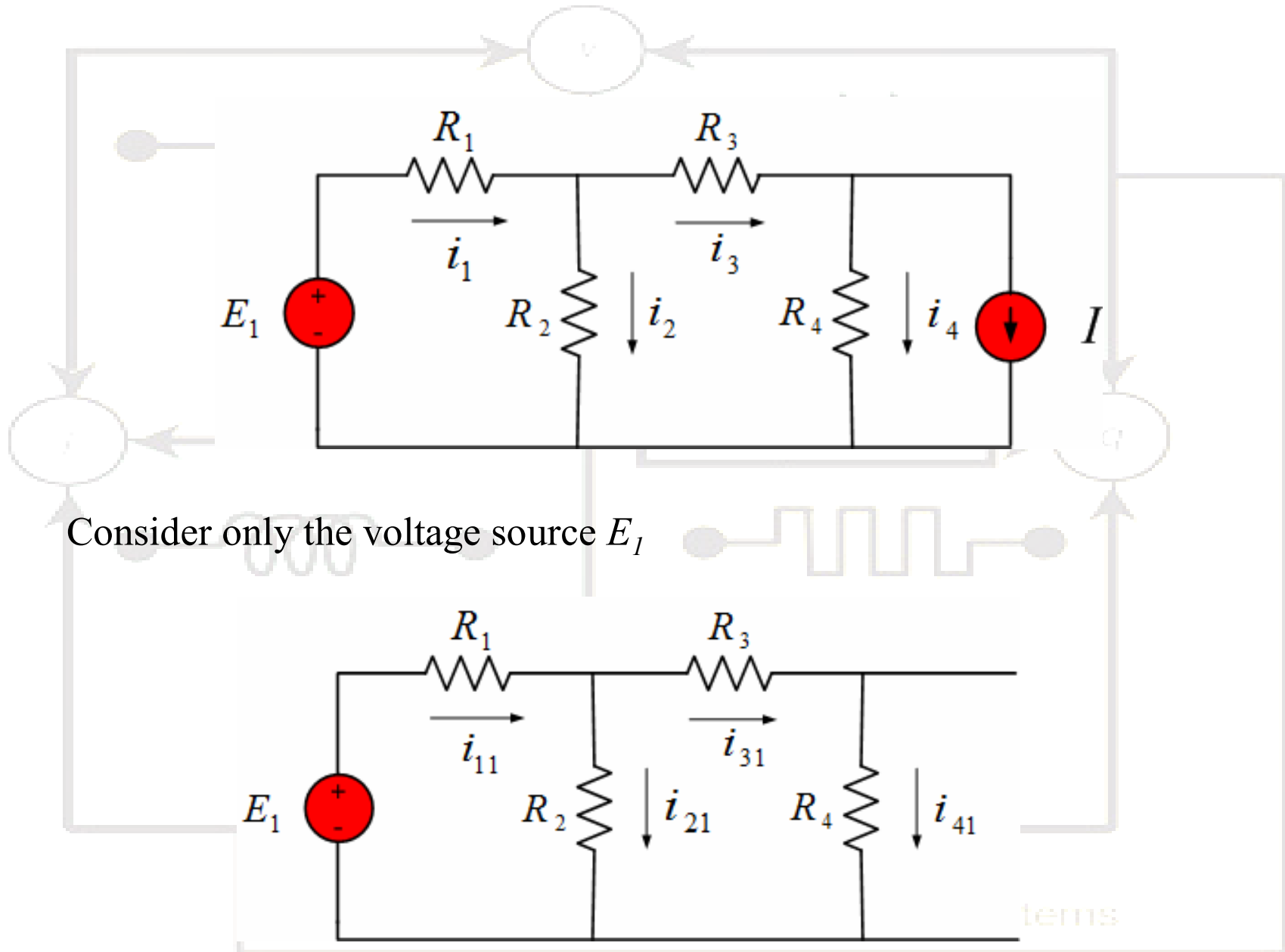
1- Turn off all independent sources except one source. Find the required (voltage or current) due to that active source.

Current Source → open circuit (0 A)

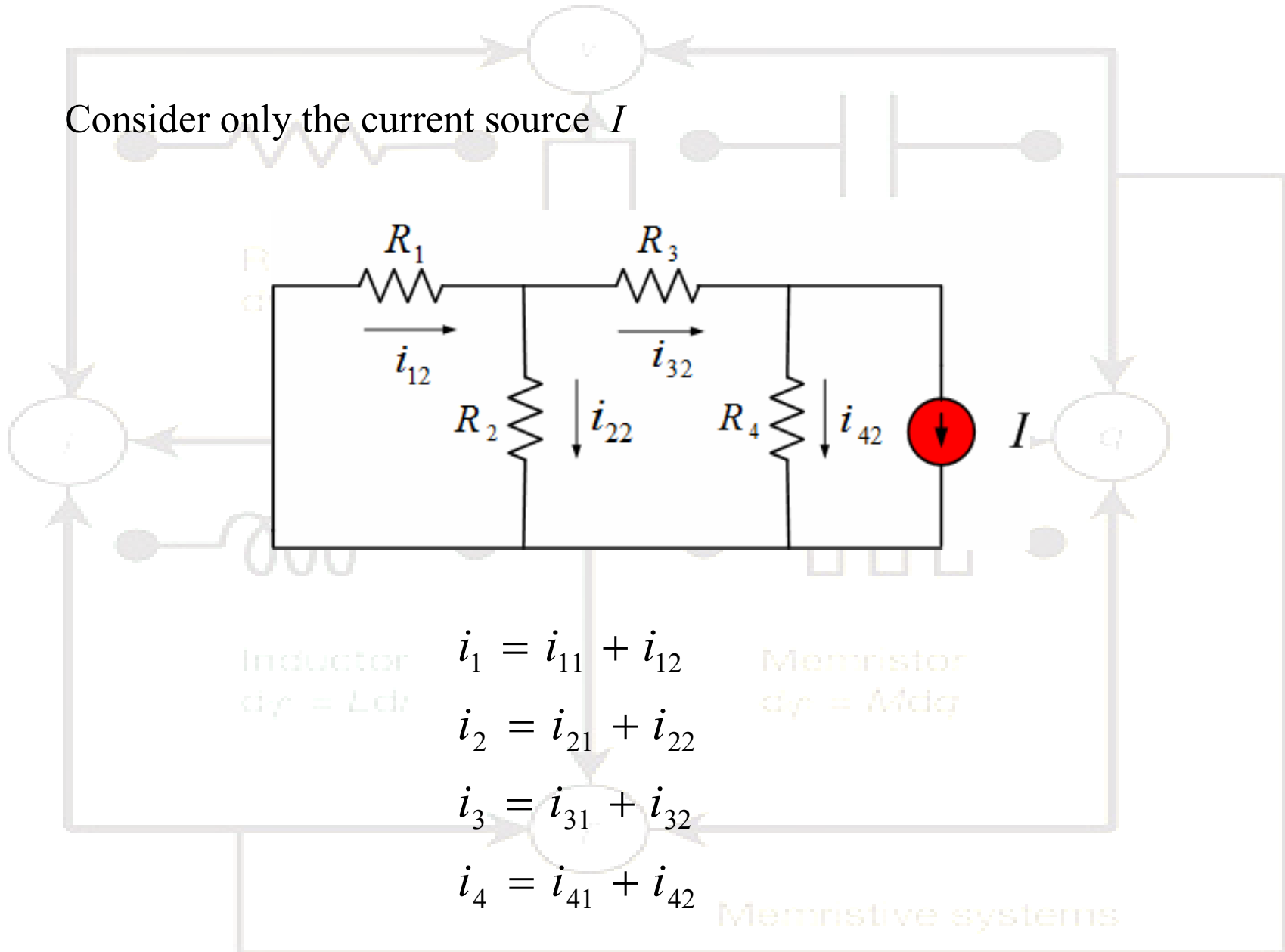
Voltage Source → short circuit (0 V)

2- Repeat step 1 for each other independent sources.

3- Find the total contribution by adding algebraically all the contribution due to the independent source.

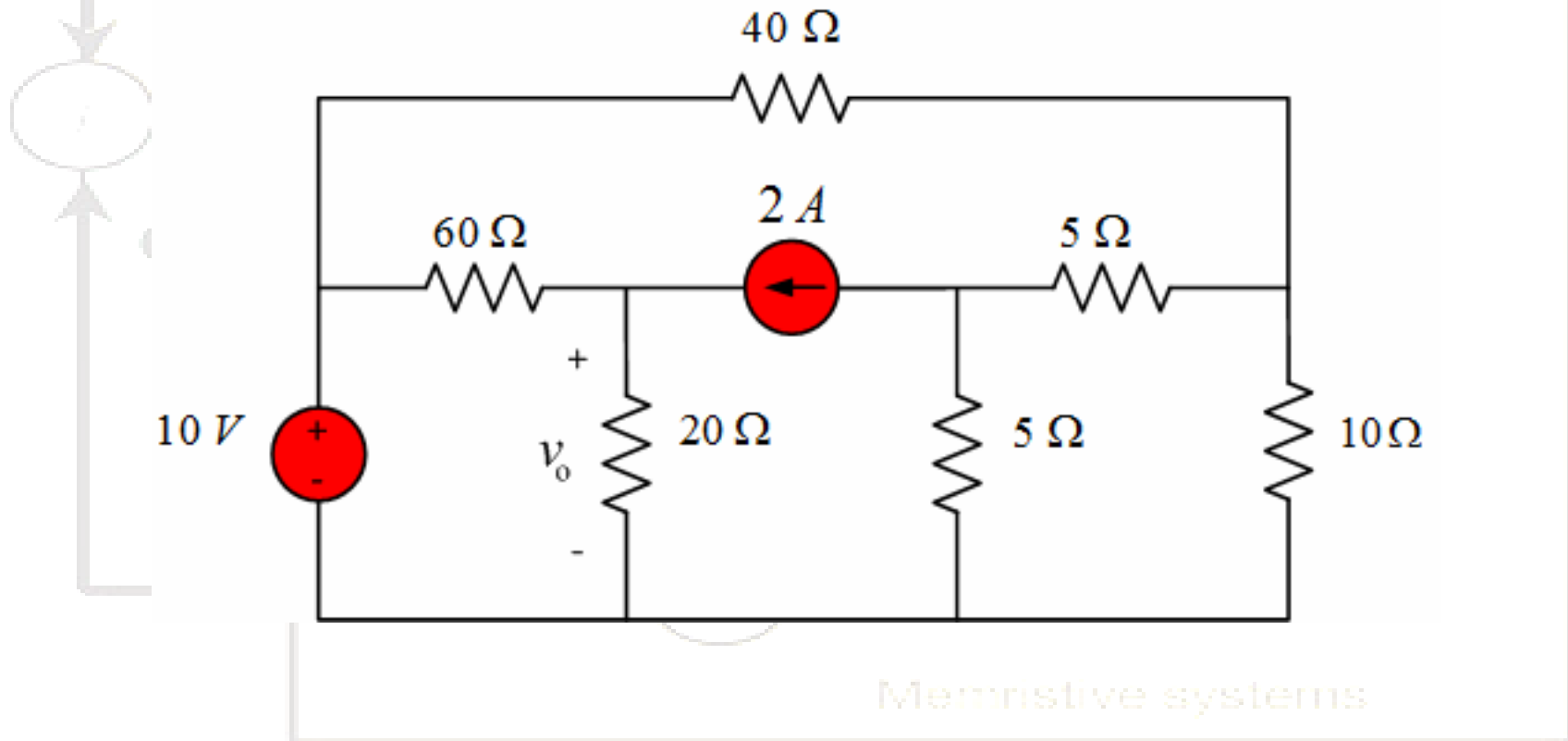


Consider only the current source I



Example:

Use the principle of superposition to find v_o in the circuit shown.



Example:

Use the principle of superposition to find the current i_o in the circuit shown.

