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Superposition Method of Control Circuit Analyzing

Sometimes, the electrical circuits can’t be calculated by traditional methods, or the use of the add leads to very complicated equations. To simplify the calculations, the superposition method is often used. This theorem states that the response in a linear circuit at any point due to multiple sources can be calculated by summing the effects of each source considered separately, all other sources being made inoperative. In addition, this theorem is advisable to use in circuits with non-sinusoidal currents. However, the theorem can be applied only for linear and bilateral circuits.

In any multisource circuit which consists of linear bilateral components, the voltage across or current through any given element of the circuit is equal to the algebraic sum for the individual voltages or currents, produced independently across or in that element by their respective internal resistances.

In this method, we must consider effect of every source particularly; all other sources there must be a substitute.

The sources can be substituted using the following methodology.

1. Ideal voltage sources are short-circuited
2. Ideal current sources are open-circuited

However, in case with real sources their internal resistances replace this one. This is shown in Figure 1.

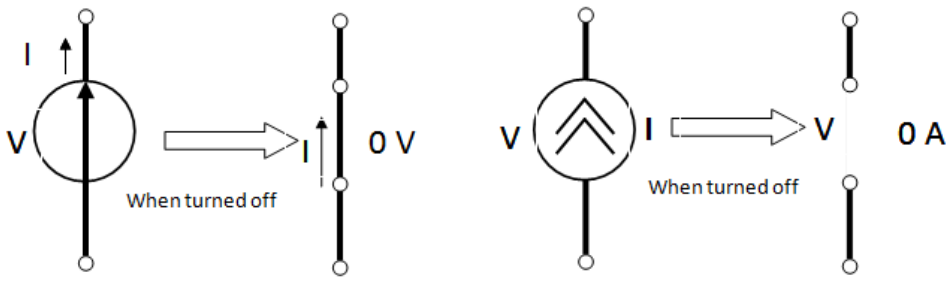

Figure 1

After transformation scheme, to be able to determine the current steps by repeating the previous file for each source all the currents are given. By summing the individual effects produced by each source we obtain the total current in the element or voltage across the one.

Therefore, superposition method is very useful for investigation of schemes having more than one source of energy. Given the fact that the waves propagate independently of each other, it all the waves are summed to obtain a resultant wave. It means what this one provides the possibility of calculation resulting currents with higher harmonics, which is a very important feature of electrical engineering.