

OHMS LAW:-The current flowing through a conductor is directly proportional to the potential difference existing between the two ends of the conductor, provided the physical conditions (temperature, pressure etc.) remain same. In other words the ratio of potential difference between two points on a conductor to the current flowing between them, is constant or $V/I=R$ where R is the resistance of the conductor which is kept constant.

STATEMENT OF KCL: - Algebraic sum of all branch currents entering & leaving a node is zero at all instant of time. i.e., sum of incoming currents = sum of outgoing currents. This is a consequence of conservation of charge.

STATEMENT OF KVL: - Algebraic sum of all branch voltage around any closed loop of a network is zero at all instant of time. In other words: $\sum IR + \sum EMF = 0$. This is a consequence of conservation of energy.

AN IDEAL VOLTAGE SOURCE is energy source which can supply energy at constant voltage i.e. when the load current is changed from minimum to maximum, the terminal voltage remains same. To satisfy this requirement the internal resistance of the source should be zero.

AN IDEAL CURRENT SOURCE is an energy source which can supply energy at constant current. To satisfy this requirement the internal resistance of the source should be infinity.

THEVENINS THEOREM:- Any two terminal active network containing voltage source and resistance when viewed from its output terminals, is equivalent to a constant voltage source and a series resistance. The constant voltage is equal to the open circuit voltage across the two terminals and series resistance is the resistance of the network when viewed from these open circuited terminals after all voltage and current sources have been removed and replaced by their internal resistance.

NORTONS THEOREM:- Any two terminal active network containing voltage source and resistance when viewed from its output terminals, is equivalent to a constant current source and a parallel resistance. The constant current is equal to the current which would flow in a short circuit placed across the two terminals and parallel resistance is the resistance of the network when viewed from these open circuited terminals after all voltage and current sources have been removed and replaced by their internal resistance.

MAXIMUM POWER TRANSFER THEOREM:- A resistive load will extract maximum power from a network when the load resistance is equal to the resistance of the network as viewed from the output terminals, with all energy sources removed leaving behind their internal resistances.

SUPER POSITION THEOREM:-In a linear bilateral network the total response due to multiple sources is equal to the summation of responses due to individual sources.

1.**LOOP:-**It is a close path in a circuit in which no element or node is encountered more than once.

2.**MESH:-**It is a loop that contains no other loop within it.

3.**NODE:-**is a junction in a circuit where two or more circuit elements are connected together.

4.**CIRCUIT:-** A circuit is a closed conducting path through which an electric current either flows or is intended flow.

5.**PARAMETERS:-**The various elements of an electric circuit are called its parameters like resistance, inductance and capacitance. These parameters may be lumped or distributed.

6.**LINEAR CIRCUIT:-**A linear circuit is one whose parameters are constant i.e. they do not change with voltage or current.

7.**NON LINEAR CIRCUIT:-**It is that circuit whose parameters change with voltage or current.

8.**BILATERAL CIRCUIT:-**A bilateral circuit is one whose properties or characteristics are the same in either direction. The usual transmission line is bilateral, because it can be made to perform its function equally well in either direction.

9.**UNILATERAL CIRCUIT:-** It is that circuit whose properties or characteristics change with the direction of its operation. A diode rectifier is a unilateral circuit, because it cannot perform rectification in both directions.

10.**ELECTRIC NETWORK:-**A combination of various electric elements, connected in any manner whatsoever, is called an electric network.

11.PASSIVE NETWORK:-is one which contains no source of e.m.f. in it.

12.ACTIVE NETWORK:-is one which contains one or more than one source of e.m.f.

13.BRANCH:-is that part of a network which lies between two junctions.

Incandescent lamps are electric light which produces light with a filament wire heated to a high temperature by an electric current through it, until it glows. The temperature of the filament is approximately 3000K. At this high temperature the resistance of the filament changes substantially and hence it shows a nonlinear V-I characteristic.