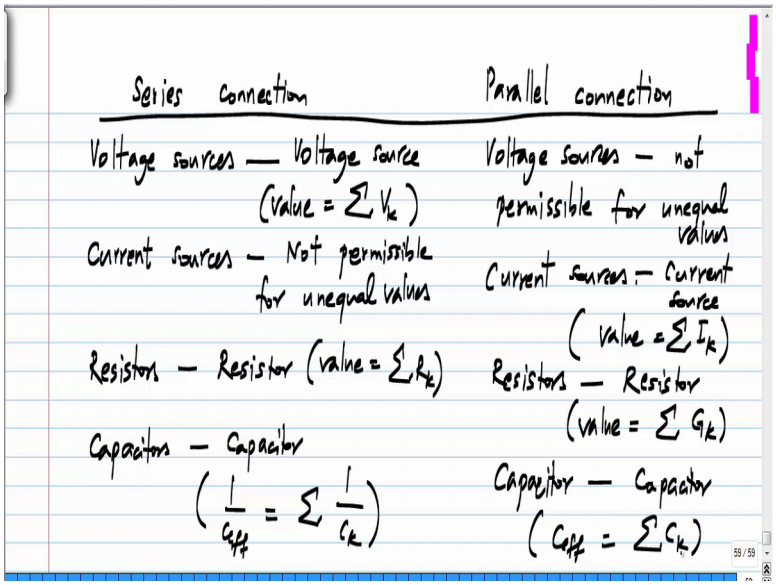
Basic Electrical Circuits
Dr Nagendra Krishnapura
Department of Electrical Engineering
Indian Institute of Technology Madras

Lecture - 20
Summary

(Refer Slide Time: 00:28)

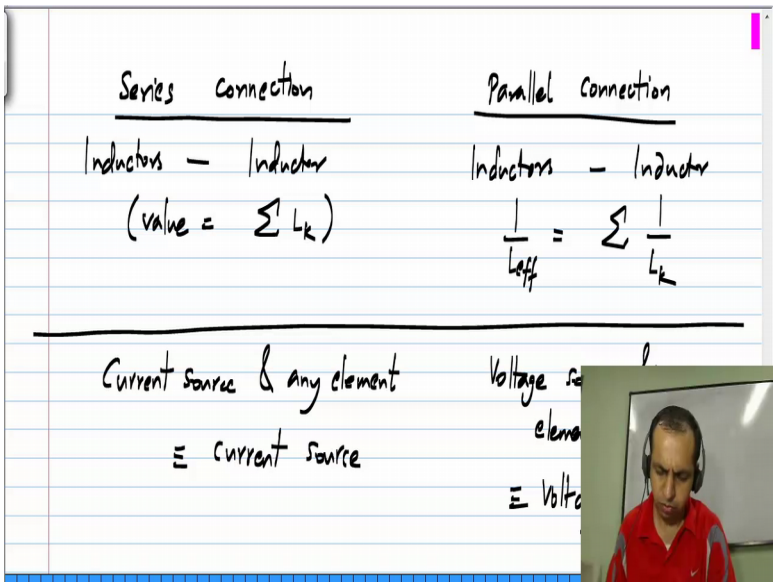


Here is a quick summary of the result of connecting a several elements in series or parallel; effectively after the series connection, we get another two terminal elements and it is the characteristic of this two terminal element that we are trying to determine. So, if you connect a number of similar elements in series, the result is also the same elements and its value can be different. So, if you have a series connection of voltage sources, we get a voltage source whose value is the sum of individual sources in series. And if you take current sources - a series connection of current sources is not permissible for unequal values. And the parallel connection case is the counter part of this; a parallel connection of a voltage sources is not permissible for unequal values. And if you have parallel connection of current sources, then the result is also a current source whose value is the sum of individual current sources.

If you take other elements, if you take series connection of resistors the result is of course still a resistor, whose value is the sum of individual resistances. Similarly, if you take parallel connection of resistor the result is still a resistor, whose value is the sum of individual conductance that is the conductance of the resulting resistors is the sum of individual conductance. And similarly if you take capacitors in series, the result is still a capacitor, and

reciprocal of the effective capacitance equals sum of reciprocal of individual capacitances whereas for parallel connections and the capacitor value is the sum of individual capacitances.

(Refer Slide Time: 03:56)



Series connection of an inductors will result in an inductor whose value is the sum of inductances, and parallel connection of inductors results in an inductor whose value will effective reciprocal of that is given by sum of reciprocals of individual inductors. So, all of this refers to connecting like elements in series or parallel. Now if you have dissimilar elements in general you have to work out the characteristic, but we looked at two special cases – a series connection of a current source and any element is the current source itself; and a parallel connection of a voltage source and any element is the voltage source itself, so that is the summary of what happens with series and parallel connection of elements.