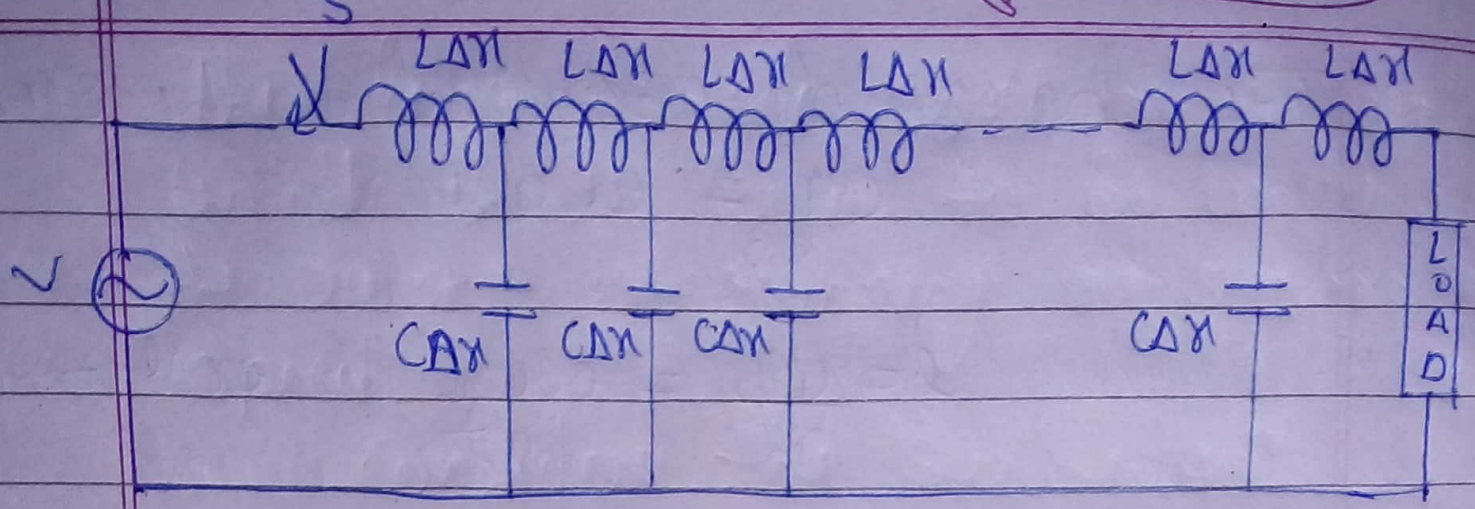
(2) A surge is a movement of charge along the conductor.

Consider a lossless transmission line which has series inductance ($L\Delta x$) of length Δx & shunt capacitance ($C\Delta x$) of length Δx. &



When the switch S is closed, the current passing through the first inductance is zero because it acts as an open ckt.

It is therefore clear that the voltage at the succeeding section builds up gradually & finally the voltage wave reaches the other end of the line.

Wave equation-

$$\frac{\partial^2 e}{\partial x^2} = LC \frac{\partial^2 e}{\partial t^2}$$

$$\frac{\partial^2 i}{\partial x^2} = LC \frac{\partial^2 i}{\partial t^2}$$