Q. 01 Power P is to be delivered to a device via transmission cables having resistance R_c. If V is the voltage across R and I the current through it, find the power wasted and how can it be reduced.

Solution:

The power consumed in transmission lines is given by $P = i^2 R_c$, where R_c is the resistance of connecting cables. The power is given by

$$P = VI$$

There are two ways to transmit the given power (i) at low voltage and high current or (ii) high voltage and low current. In power transmission at low voltage and high current more power is consumed as $P \propto i^2$ whereas power transmission at high voltage and low current facilitates the power transmission with minimal power consumption.

The power wastage can be reduced by transmitting power at high voltage.