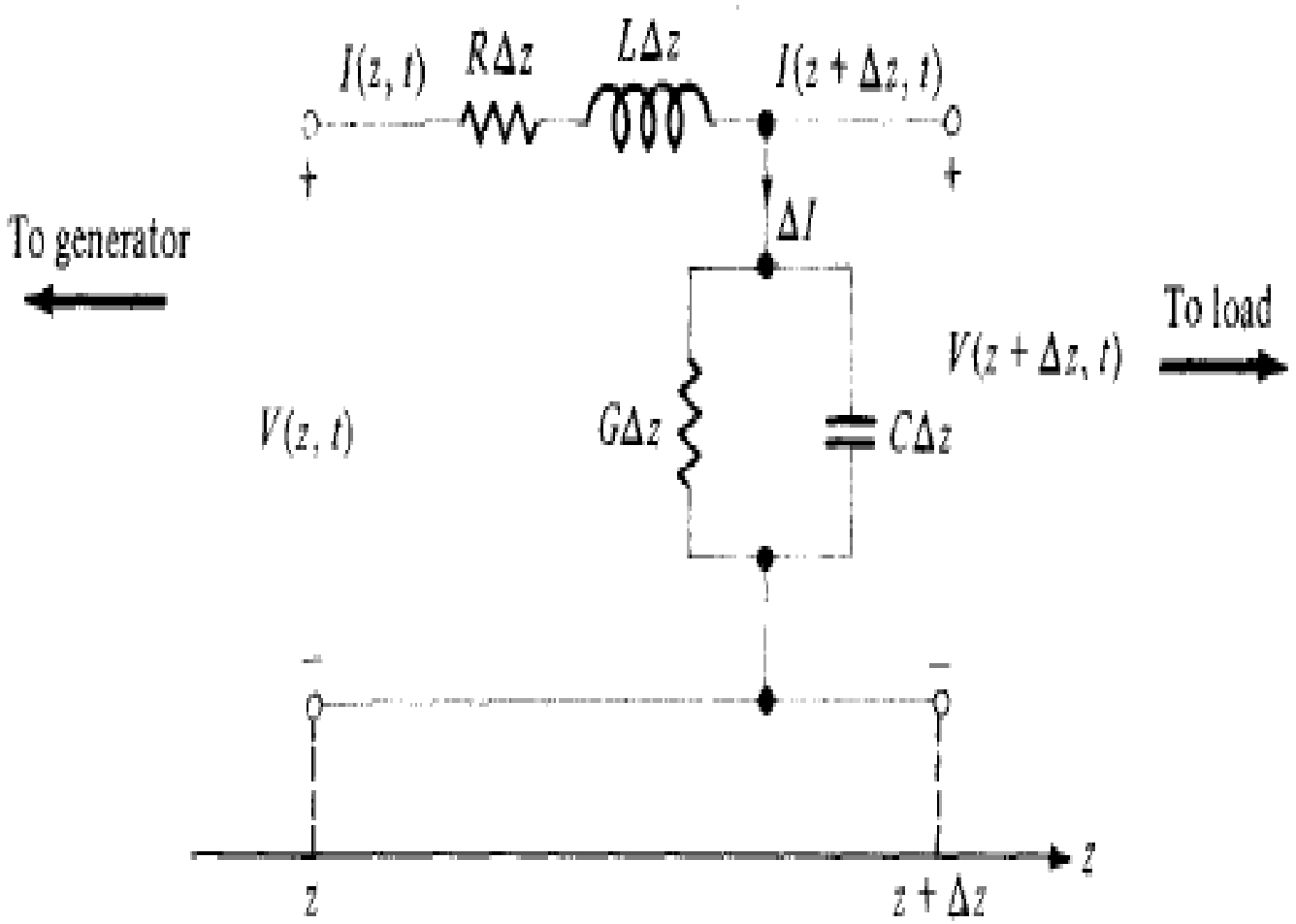
LECTURE NO 33

Topics

- Transmission lines:
- Transmission line parameters,
- Transmission line equations,
- input impedance,
- standing wave ratio and power


I(z, t)
RΔz
LΔz
I(z + Δz, t)
+
+
ΔI
To generator
To load
V(z + Δz, t)
V(z, t)
GΔz
CΔz
−
−
z
z + Δz

$$-\frac{\partial I(z,t)}{\partial z} = G\,V(z,t) + C\frac{\partial V(z,t)}{\partial t}$$

If we assume harmonic time dependence so that

$$V(z,t) = \text{Re}\,[V_s(z)\,e^{j\omega t}] \tag{11.7a}$$

$$I(z,t) = \text{Re}\,[I_s(z)\,e^{j\omega t}] \tag{11.7b}$$

where $V_s(z)$ and $I_s(z)$ are the phasor forms of $V(z,t)$ and $I(z,t)$, respectively, eqs. (11.4) and (11.6) become

$$-\frac{dV_s}{dz} = (R + j\omega L)\,I_s \tag{11.8}$$

$$-\frac{dI_s}{dz} = (G + j\omega C)\,V_s \tag{11.9}$$

$$\gamma = \alpha + j\beta = \sqrt{(R + j\omega L)(G + j\omega C)}$$

$$Z_o = \sqrt{\frac{R + j\omega L}{G + j\omega C}} = R_o + jX_o$$