ASSIGNMENT 6

TADIPATRI UDAY KIRAN REDDY
EE19BTECH11038

March 12, 2022

Problem 1

$V_2^+ = 0$

$$\Gamma_{L1} = \frac{\frac{Z_L}{Z_0} - 1}{\frac{Z_L}{Z_0} + 1} = \frac{1}{21} \tag{1}$$

$$\implies \frac{V_1^-}{V_1^+} = \boxed{S_{11} = \frac{1}{21}} \tag{2}$$

Since source at Port 2 is macthing network then,

$$V_2^- = (V_1^+ + V_1^-)\frac{50}{50+5} \tag{3}$$

$$\frac{V_2^-}{V_1^+} = S_{12} = (S_{11}+1)\frac{10}{11} \tag{4}$$

$$\implies S_{12} = \boxed{\frac{310}{231}} \tag{5}$$

$V_1^+ = 0$

The above network is clearly symmentric which means rows of scattering matrix are same.

$$\mathbf{S} = \boxed{\begin{bmatrix} \frac{1}{21} & \frac{310}{231} \\ \frac{1}{21} & \frac{310}{231} \end{bmatrix}} \tag{6}$$

Problem 2

Problem 3

At We know that,

$$Z_{in}(x) = Z_0 \left[\frac{1 + \Gamma_L e^{2\gamma x}}{1 - \Gamma_L e^{2\gamma x}}\right] \tag{7}$$