Special Problem 4.3-6

The voltage along the transmission lines below have the form:

\[ V_1(z_1) = 4e^{-j\beta z_1} + Ae^{+j\beta z_1} \]

\[ V_2(z_2) = Be^{+j\beta z_2} \]

The two-port device has an impedance matrix:

\[ Z = \begin{bmatrix} 2Z_0 & Z_0 \\ Z_0 & 2Z_0 \end{bmatrix} \]

1. First, determine the values \( A \) and \( B \).

2. Then, determine the scattering parameters \( S_{11} \) and \( S_{21} \) for the two-port device (make sure you justify your approach).