Special Problem II.A-22

Consider a **directional coupler** with the following scattering matrix:

$$\bar{\bar{S}} = \begin{bmatrix} 0.01 & 0.98 & j0.1 & 0.01 \\ 0.98 & 0.01 & 0.01 & j0.1 \\ j0.1 & 0.01 & 0.01 & 0.98 \\ 0.01 & j0.1 & 0.98 & 0.01 \end{bmatrix}$$

Assuming that all ports are terminated in matched loads, determine **in dB**:

a) the **return loss** of the input ports.

b) the **coupling** of the device.

c) the **directivity** of the device.

d) the **isolation** of the device.

e) the **coupling loss** of the device.

f) the **mainline loss** of the device.

g) the **insertion loss** of the device.