1. Consider the two-port of Problem 2 of the midterm examination. Let \( r = R = 50 \Omega \), and assume terminations \( R_1 = R_2 = 50 \Omega \).

   a. Find the scattering matrix of the circuit.

   b. What can you tell about power transmission properties of the terminated two-port?

2. Find the sensitivities of \( v_o \) and the input resistance \( R_{in} \) to variations of \( R_1, R_2 \) and \( \beta \). Assume \( R_1 = 2 \, \text{k}\Omega, R_2 = 4 \, \text{k}\Omega \) and \( \beta = 4 \).