ASSIGNMENT # 2 (15 POINTS)

1. If the signal rise time is 100psec, how much should be the electrical length of the trace to be a transmission line? Also, calculate the spatial extent of the leading edge of the signal. Calculate electrical length and spatial extent for both a) air and b) Dielectric material with Dk: 3.
2. Describe in your own words, why it is important to have controlled impedance in a transmission line? What effects do the impedance discontinuities have on the signal?
3. A. Calculate what should be the trace width for a microstrip trace on a 2mil thick dielectric with a material of dielectric constant of 3.2 to get 50ohm characteristic impedance.

B. If the dielectric thickness is changed to 4mil, what should be the trace width to get 50ohm on the same dielectric material.

1. Explain why the characteristic impedance doesn’t depend on the length of the transmission line but the propagation delay depends on the length of the transmission line.
2. Create the bounce diagram for the below configuration. Also, draw the voltage signal curve at the far end with a 100 ohm termination.

