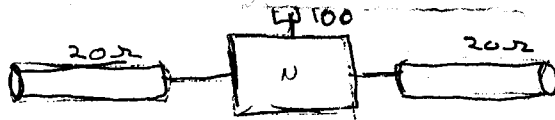
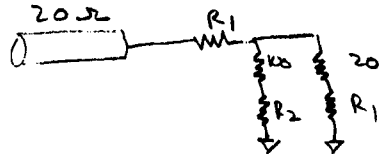


3-7



①

Let N be a T-network:

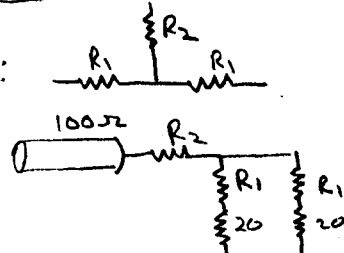


$$20 = R_1 + (R_2 + 100) \parallel (R_1 + 20)$$

→ Solve for R_1

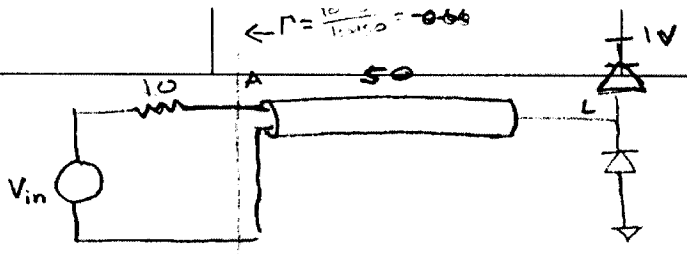
$$R_1 = 1.053 \Omega$$

$$R_2 = 89.4737 \Omega$$



$$100 = R_2 + (R_1 + 20) \parallel (R_1 + 20)$$

3-10

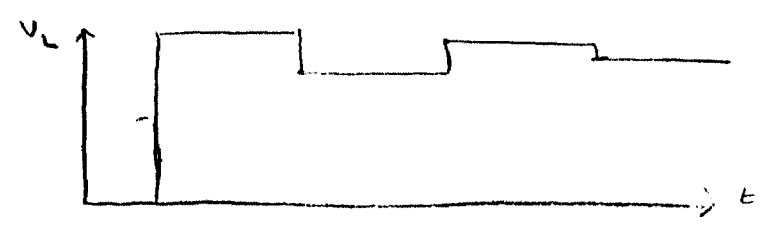
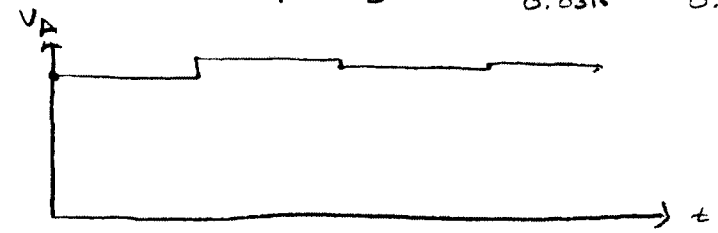


$$V_{incident} = \frac{50}{10+50} (V_{in}) = \frac{50}{60} v(t) = 0.833 \quad \text{for } t > 0$$

if $V_L > 1V \Rightarrow V_L = 1V$, and +ve wave is reflected such that this boundary condition is met
 if $V_L < 0V \Rightarrow V_L = 0$, and $\Gamma_L = -1V$

\Rightarrow 1st wave $\Rightarrow 0.833 V \Rightarrow$ sees $\Gamma = 1$ reflection until $V_L = 1V$
 so, +0.166 V is reflected

Wave	Volts	total
1 st incident	0.833	0.833
1 st L reflection	0.166	<u>1</u>
1 st S reflection	-0.109	0.891
2 nd L	-0.109	<u>0.782</u>
2 nd S	0.072	0.854
2 nd L	0.072	<u>0.926</u>
3 rd S	-0.048	0.878
4 th L	-0.048	<u>0.831</u>
4 th S	0.0316	0.862



13-782 50 SHEETS, FILLER, 5 SQUARE
 42-381 100 SHEETS, FILLER, 5 SQUARE
 42-382 200 SHEETS, FILLER, 5 SQUARE
 42-383 300 SHEETS, FILLER, 5 SQUARE
 42-384 400 SHEETS, FILLER, 5 SQUARE
 42-385 500 SHEETS, FILLER, 5 SQUARE
 42-386 600 SHEETS, FILLER, 5 SQUARE
 42-387 700 SHEETS, FILLER, 5 SQUARE
 42-388 800 SHEETS, FILLER, 5 SQUARE
 42-389 900 SHEETS, FILLER, 5 SQUARE
 42-390 1000 SHEETS, FILLER, 5 SQUARE
 MADE IN U.S.A.



3) Coax cable: $\epsilon_r = 3.5$
 $Z_0 = 50 \Omega$

$$v_i = \frac{3 \times 10^8}{\sqrt{3.5}} = 1.604 \times 10^8 \text{ m/s}$$

⇒ takes 15.6 ns to traverse 2 m

The spacings indicate the length scale that a line can be without a matched termination. If the length becomes long relative to the switching speed a matched termination must be used to ensure that reflected waves do not degrade future signals.

50 SHEETS FULLER 8 SQUARE
50 SHEETS EYEGLASS 8 SQUARE
100 SHEETS EYEGLASS 8 SQUARE
100 SHEETS EYEGLASS 9 SQUARE
100 SHEETS EYEGLASS 9 SQUARE
100 RECYCLED WHITE 8 SQUARE
42-389 200 RECYCLED WHITE 8 SQUARE
Made in U.S.A.



