University of Portland
School of Engineering

EE 301
Spring 2018
A. Inan

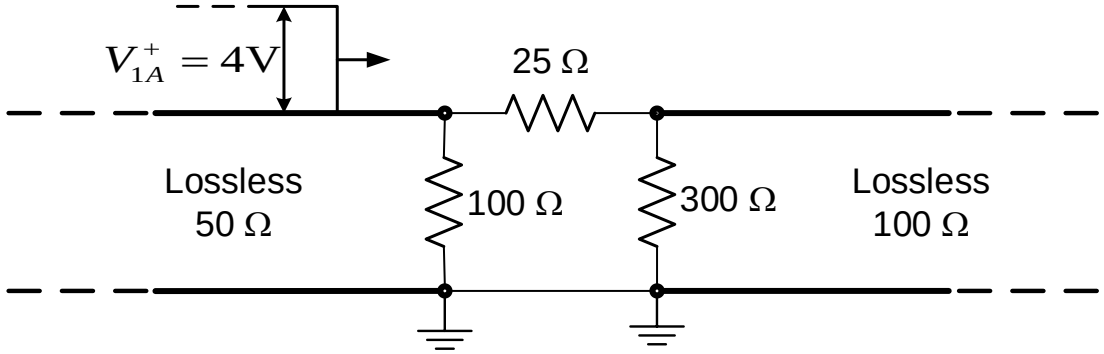
Homework # 3
(Assigned: Wednesday, February 7, 2018)
(Due: Friday, February 16, 2018, 11:25a.m.)

These problems are assigned from Engineering Electromagnetics and Waves (Second Edition, 2015) by Inan[2] Said (pages 80-98):

2.13. Time-domain reflectometry (TDR).
2.15. Time-domain reflectometry (TDR).
2.19. Parallel multiple lines.
2.24. Digital IC interconnect.
2.25. Terminated IC interconnects.

Inan Problem # 1: Reflected & transmitted voltage waves.

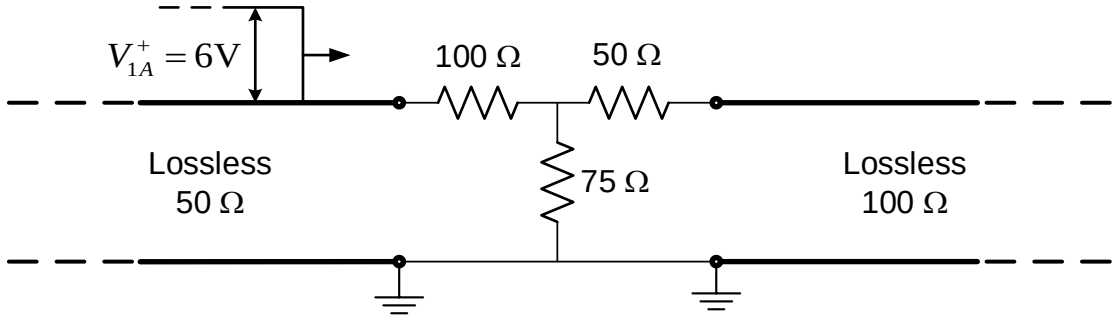
Two lossless transmission lines A & B are connected via a lumped Π resistive network as shown.



If a step-type voltage wave $V_{1A}^{+} = 4\,\text{V}$ traveling on the 50 Ω line is approaching towards the junction from the left side, find the reflected and transmitted voltage waves V_{1A}^{-} and V_{1B}^{+}.

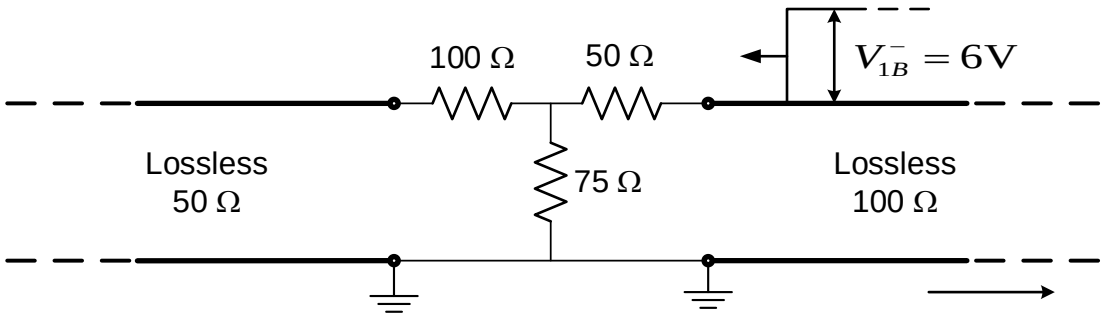
Inan Problem # 2: Reflected & transmitted voltage waves.

(a) Two lossless transmission lines A & B are connected via a lumped T resistive network as shown.



If a step-type voltage wave $V_{1A}^{+} = 6\,\text{V}$ traveling on the 50 Ω line is approaching towards the junction from the left side, find the reflected and transmitted voltage waves V_{1A}^{-} and V_{1B}^{+}.

(b) Repeat part (a) if the step-type voltage is approaching the junction from the right side, as shown. If the step-type voltage wave traveling on the 100 Ω line is given as $V_{1B}^{-} = 6\,\text{V}$, find the reflected and transmitted voltage waves V_{1B}^{+} and V_{1A}^{-}.



Please use the following guidelines for your homework solutions:

1) On the first sheet, at the top center, write: Homework #3-Solutions.
2) Provide your full name on the upper right corner of the first sheet.
3) Also write: EE 301/Spring 2018 on the upper left corner of the first sheet.
4) Solve each problem on a separate sheet unless your solution is very short.
5) Box all of your answers.
6) Staple your solutions in the above order before you turn them in.

Please turn in your homework on time.

Happy Double Consecutive *e* Days!
February 7, 2018 (2/7/18) & February 8, 2018 (2/8/18)
***e* ≈ 2.7182818**