UNIVERSITY ☺F P☺RTLAND
Sch☺☺l ☺f Engineering

EE 301-Electromagnetic Fields-3 cr. hrs.
Spring 2004

Midterm Exam # 1

(Prepared by Professor A. S. Inan)

(Friday, February 27, 2004)
(Closed Book Exam; 1 Formula Sheet Allowed)
(Total Time: 55 mins.)

Name:_____ ☺

Signature:_____ ☺

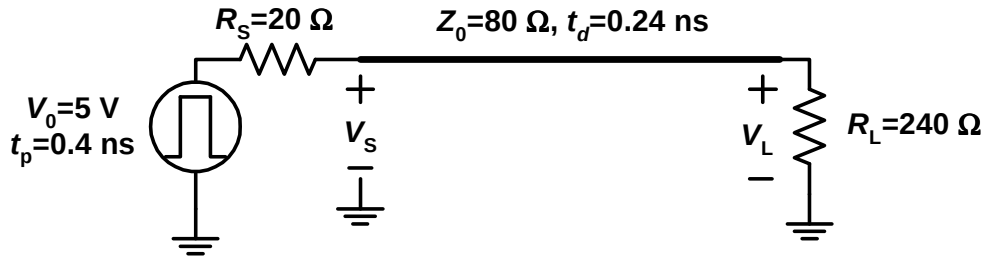
"Honesty is the best policy."
Aesop (~ 620B.C. –?)

"An honest mind possesses a kingdom."
Lucius Annaeus Seneca (4B.C.–65A.D.)

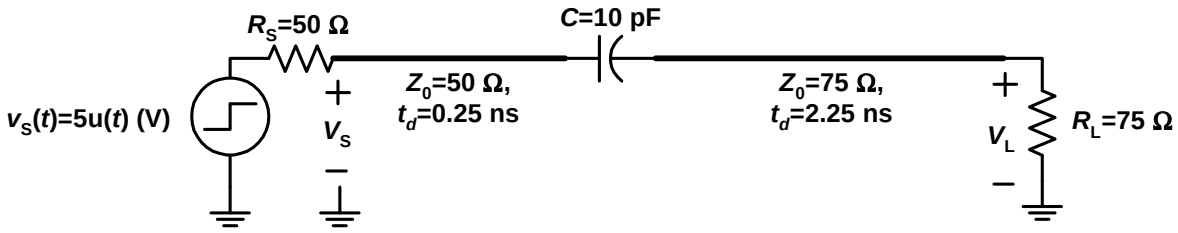
"Honest people are the true winners of the universe."
Anonymous

"Honesty is not for sale."
A. Inan

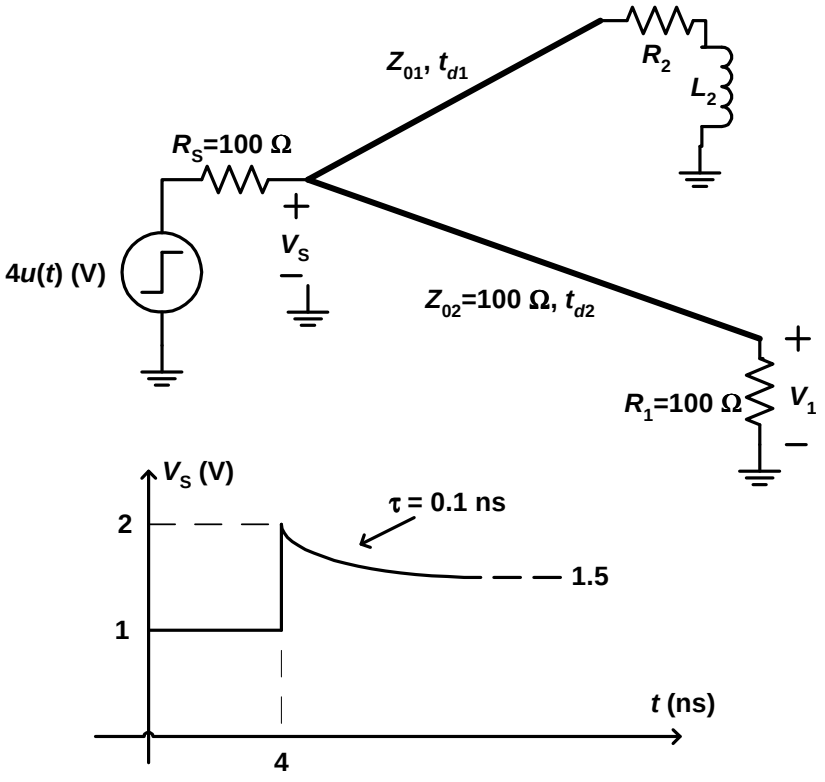
(1) (20 mins., 40 points) **Pulse excitation of a lossless transmission line.** For the transmission line circuit shown, sketch both the source-end and the load-end voltages as a function of time between t = 0 and t = 1ns. Provide all the relevant values on your sketches. Also provide a bounce diagram for your solution.



(2) (Extra problem!) **Capacitor between two lossless transmission lines.** For the transmission line circuit shown, find and sketch the source-end and load-end voltages as a function of time. Provide all the appropriate values on your sketches.



(3) (25 mins., Total: 60 points) **TDR waveform of a loss-less transmission line system having an inductive termination.** The TDR waveform for the source-end voltage provided below applies to the transmission line circuit shown.



(a) (40 points) Use the TDR waveform provided to calculate the values of the circuit parameters Z_{01}, t_{d1}, R_2 and L_2.

(b) (20 points) Assuming t_{d2}=4 ns, sketch the voltage $V_1(t)$ across the 100 Ω termination at the end of line # 2. Present all the relevant values on your sketch.