University ☺f P☺rtland
Sch☺☺l ☺f Engineering

EE 301-Electromagnetic Fields-3 cr. hrs.
Spring 2005

Midterm Exam # 1

(Prepared by Professor A. S. Inan)

(Wednesday, March 2, 2005)
(Closed Book Exam; 1 Formula Sheet Allowed)
(Total Time: 55 mins.)

Name:_____ ☺

Signature:_____ ☺

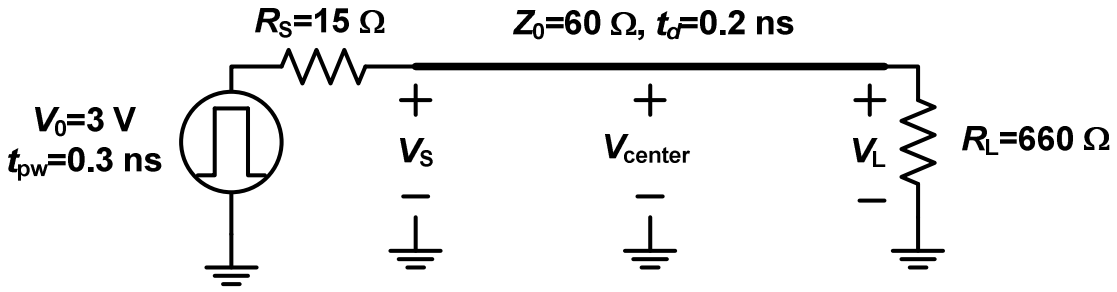
"Honesty is the best policy."
Aesop (~ 620B.C. –?)

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

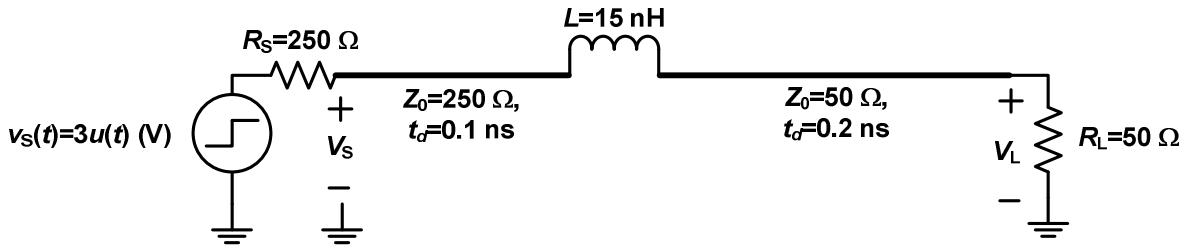
"Honest people are the true winners of the universe."
Anonymous

"Honesty is not for sale."
A. Inan

(1) (15 mins., 30 points) **Pulse excitation of a lossless transmission line.** For the transmission line circuit shown, sketch the voltages V_S, V_{center}, and V_L as a function of time between $t = 0$ and $t = 1^+$ ns. Provide all the relevant values on your sketches. Also provide a bounce diagram for your solution.



(2) (20 mins., 40 points) **Lumped inductive element 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. Show your work and provide all the appropriate values on your sketches.



(3) (15 mins., 30 points) **Load reflection coefficient, standing wave ratio and input impedance.** Consider the transmission line circuit shown. Assuming sinusoidal steady-state condition, find (a) the load reflection coefficient; (b) the standing wave ratio on the line; and (c) the input impedance of the line. Show your work and provide all your results in their simplest form.