**T-Line Homework 3 (15 Points)**

(jas T-Line HW3.docx 9/01/2022)

Use units and clearly label answers using 3 or 4 significant digits where appropriate. **Show your work** so that if necessary partial credit can be awarded.

1. Using the method and equation given in the Ulaby text for a shorted transmission line, calculate the minimum line length in cm that would results in a transmission line input impedance equivalent to that of a 10 nH inductor for a shorted 50 Ω transmission line operating at 1.2 GHz with up = 0.7c. (Hint: Answer should be between 2 to 4 cm.)

(6 points.)

A piece of paper with writing on it

AI-generated content may be incorrect.

1. Using the method and equation given in the Ulaby text for a shorted transmission line, calculate the minimum line length in cm that would results in a transmission line input impedance equivalent to that of a 10 pf capacitor for a shorted 75 Ω transmission line operating at 1 GHz with up = 0.667c. (Hint: Answer should be between 8 to 10 cm.)

(6 points.)

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1. A feeder transmission line with characteristic impedance of 75 Ω is to be interfaced to a 50 Ω load using a λ/4 transformer. Calculate the characteristic impedance Z02 necessary for a λ/4 transformer to eliminate reflections on the feeder line including units. (Hint: You can check your answer to this problem by means of the original expression.)

(3 points.)

A notebook with writing on it

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