Arab Academy for Science & Technology and Maritime Transport – Cairo Branch
College of Engineering & technology
Electronics & Communication Engineering Department

EC443 EM Transmitting Media

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Problems Set #1

P1.1 The parameters of a certain transmission line operating at 6×10^8 rad/s are : L=0.4μH/m, C=40 Pf/m. G=80 mS/m, and R=20 Ω/m.

(a) Find β, γ, α, and Zo.
(b) If a voltage wave travels 20 m down the line , what percentage of the original wave amplitude remains, and by how many degrees is its phase shifted .

P1.2 A lossless transmission line having Zo=120 Ω is operating at *w*= 5×10^8 rad/s. If the velocity on the line is 2.4 ×10^8 m/s, find:

(a) L; (b) C; (c) Let the load impedance be represented by the inductance of 0.6μH in series with a 100 Ω resistance . Find the reflection coefficient & VSWR.

P1.3 Two characteristics of a certain lossless transmission line are Zo=50 Ω and γ= j 0.2 π 1/m at f=60MHz: (a) Find L & C for the line. (b) A load impedance has a value of 60+j80 Ω is located at z=0. What is the shortest distance from the load to a point at which Zin=Rin+j0 ?

HomeWork Assignment#1:

H1.1 The propagation constant of a lossy transmission line is 1+j 2 1/m, and the characteristic impedance is 20 Ω at w=1 Mrad/s. Find L,C,R , and G for the line.

H1.2 1.2 A lossless transmission line with Zo=60 Ω is being operated at 60 MHz. The velocity on the line is 3×10^8 m/s. If the line is short-circuited at the z=0, find Zin at z=:
(a) -1 m; (b) -2 m; (c) -2.5 m; (d) -1.25m

Good Luck☺