Husni harb 12/2/13

Chapter 3 Prof. Viviana

1. negative x-direction
2. The peak value IP= 8 mA
3. ϐ = 0.025 rad/m
4. =
5. positive x-direction
6. The peak value
7. ϐ = 0.35 rad/m
8. =
9. A sinusoidal current with a peak value of 2 A and a frequency of 50 MHz is traveling in the positive x-direction with a velocity of
10. Period
11. Angular Frequency
12. Phase constant
13. Wavelength
14. An equation for the current
15. A sinusoidal voltage with a peak value of 25 V and a radian frequency of 20 Mrad/s is traveling in the negative x-direction with a velocity of
16. Cyclic frequency
17. Period
18. Phase constant
19. Wavelength
20. An equation for the current
21. Consider the current traveling wave of Problem 3-1.
22. A fixed phasor representation in peak units as either or
23. The corresponding distance-varying phasor in peak units
24. The wave of the distances-varying phasor at x = 100 m.
25. Consider the voltage traveling wave of Problem 3-2.
26. A fixed phasor representation in peak units as either or
27. The corresponding distance-varying phasor in peak units.
28. The wave of the distances-varying phasor at x = 4 m
29. Repeat the analysis of Problem 3-5 if the current of Problem 3-1 has a fixed phase shift such that it is described by
30. A fixed phasor representation in peak units as either or
31. The corresponding distance-varying phasor in peak units
32. The wave of the distances-varying phasor at x = 100 m.
33. Repeat the analysis of Problem 3-6 if the voltage of Problem 3-2 has a fixed phase shift such that it is described by
34. A fixed phasor representation in peak units as either or
35. The corresponding distance-varying phasor in peak units.
36. The wave of the distances-varying phasor at x = 4 m
37. Redefine the fixed phasor of Problem 3-5 so that the phasor magnitude is expressed in rms units, and determine the average power dissipated in a 50- resistance.
38. Redefine the fixed phasor of Problem 3-6 so that the phasor magnitude is expressed in rms units, and determine the average power dissipated in a 75- resistance.
39. Redefine the fixed phasor of Problem 3-7 so that the phasor magnitude is expressed in rms units. Would the power dissipated in a 50- resistance be the same as in Problem 3-9?

Yes they are the same.

1. Redefine the fixed phasor of Problem 3-8 so that the phasor magnitude is expressed in rms units. Would the power dissipated in a 75- resistance be the same as in Problem 3-10?

Yes they are the same.

1. Under steady-state ac conditions, the forward current wave on a certain lossless 50- line is = . Determine the voltage forward wave.
2. Under steady-state ac conditions, the forward current wave in 300 lossless line is = . Determine the current forward wave.
3. Under steady-state ac conditions, the reverse voltage wave on a lossless 50 line is = V. Determine the reverse current wave.
4. Under steady-state ac conditions, the reverse current wave on a lossless 75- line is = . Determine the reverse voltage wave.
5. A table of specifications for one version of RG - 8/U 50- coaxial cable indicates that the attenuation per 100 ft. at 50 MHz is 1.2 dB. At this frequency, determine the following:
6. Attenuation factor in decibel per foot
7. Attenuation factor in nepers per foot

For a length of 300 ft. determine the following:

1. Total attenuation in decibel
2. Total attenuation in nepers
3. Ratio using both decibels and nepers for a single wave

In terms of decibels, this ratio may be expressed as

1. A transmission line has an attenuation of 0.05 dB/m. Determine the following:
2. Attenuation factor in nepers/m

For a length of 400 m, determine the following:

1. Total attenuation in decibel
2. Total attenuation in nepers
3. Ratio using both decibels and nepers for a single wave

In term of decibles:

1. A single-Frequency wave is propagating in one direction on a transmission line of length 200m. with an input rms voltage of 50 V, the output rms voltage is measured as 20 V. Determine the following:
2. Total attenuation in decibel
3. Total attenuation in nepers
4. Attenuation factor in decibel/meter
5. Attenuation factor in nepers/meter
6. A single-Frequency wave is propagating in one direction on a transmission line of length 400m. The input power to the line is 40 W, and the output power is 12 W. Determine the following:
7. Total attenuation in decibel
8. Total attenuation in nepers
9. Attenuation factor in decibel/meter
10. Attenuation factor in nepers/meter
11. A transmission line has the following parameters at 50 MHz: , , and . Determine the following:
12. Z
13. Y

 = 22.36 x 10-3 + j1.088

α = 22.36 x 10-3 Np/m

= j1.008 rad/ft

1. A lossy audio-frequency line has the following parameters at 2 kHz: , , and .
2. Z
3. Y

 = 5 x 10-5  + j5.029 x 10-5

α = 5 x 10-5 Np/ft

= j5.029 x 10-5 rad/ft

1. Attenuation in dB/ft
2. v
3. A coaxial cable has the following parameters at a frequency of 1 MHz:

 series resistance = 0.3

series reactance = 2

 shunt conductance = 0.5 uS/m

 shunt susceptance = 0.6 mS/m

 Determine the following:

Z = 0.3 + j2 Ω/m = 2.022

 Y = 0.5µ + j0.6m S/m = 0.6m

 =

α = 2.6m Np/m

1. Attenuation in dB/ft

αdB  dB/m

1. V
2. For the coaxial cable of problem 3-23, repeat the analysis at 100 MHz if the series resistance increases to 1 , but the shunt conductance remains essentially the same. (Note: You must apply basic ac circuit theory to determine the new values for the reactance and susceptance.)

 1 + j200 = 200 Ω/m

Y = G + jB = 0.5 x 10-6 +

 = 0.5 x 10-6 + j0.06 = 0.06 S/m

 =

 = 8.3m + j3.46

α = 8.3m Np/m

ϐ = 3.46 rad/m

1. αdB = 8.69 x 8.3 x 10-3 = 0.072 dB/m
2. m/s

 = 57.74 Ω = 57.74 – j0.139

1. For the circuit of fig. P3-25, determine the following:
2. Input current
3. Input Voltage

 V

1. Input power
2. Load current
3. Load Voltage
4. Load Power
5. Line loss in dB
6. For the circuit of fig. P3-26, determine the following:
7. Input current
8. Input Voltage

 Ω

 V

1. Input power
2. Load current
3. Load Voltage
4. Load Power
5. Line loss in nepers