1. What are the parameters of a dissipation-less line at radio frequencies?

a) Resistance and capacitance
b) Inductance and conductance
c) Resistance and inductance
d) Capacitance and conductance

Answer: b) Inductance and conductance

Explanation: A dissipation-less line at radio frequencies primarily exhibits inductance (L) and conductance (G), with negligible resistance and capacitance.

2. What are the characteristics of voltage and current on a dissipation-less line?

a) Voltage and current are in phase
b) Voltage leads current by 90 degrees
c) Voltage lags current by 90 degrees
d) Voltage and current are out of phase randomly

Answer: a) Voltage and current are in phase

Explanation: In a dissipation-less line, voltage and current are in phase with each other due to the absence of resistive losses.

3. What is the Standing Wave Ratio (SWR) a measure of?

a) Efficiency of a transmission line
b) Propagation speed of electromagnetic waves

c) Mismatch in a transmission line
d) Signal attenuation in a transmission line

Answer: c) Mismatch in a transmission line

Explanation: SWR measures the degree of mismatch between the transmission line and the load impedance.

4. What is the input impedance of an open circuit termination on a transmission line?

a) Zero
b) Infinity
c) Depends on the frequency
d) Depends on the length of the line

Answer: b) Infinity

Explanation: An open circuit termination results in an infinite input impedance due to the absence of a current path.

5. How is power measured on transmission lines?

a) Directly by voltmeter and ammeter
b) By calculating the product of voltage and current
c) Through impedance matching
d) By measuring the phase angle between voltage and current

Answer: b) By calculating the product of voltage and current

Explanation: Power on transmission lines is calculated by multiplying the voltage and current, typically using a wattmeter.

6. What type of transmission line is an eighth-wave line?

a) Short-circuited line
b) Open-circuited line
c) Quarter-wave line
d) Half-wave line

Answer: b) Open-circuited line

Explanation: An eighth-wave line is an open-circuited transmission line that is a multiple of one-eighth wavelength long.

7. What is the Smith chart used for in radio frequency engineering?

a) Power measurement
b) Impedance matching
c) Wave propagation analysis
d) Voltage measurement

Answer: b) Impedance matching

Explanation: The Smith chart is a graphical tool used for impedance matching and analyzing transmission line problems.

8. How can the Smith chart be utilized to solve transmission line problems?

a) By directly measuring voltage and current
b) By plotting impedance values and performing calculations
c) By analyzing wave propagation speed
d) By calculating standing wave ratios

Answer: b) By plotting impedance values and performing calculations

Explanation: The Smith chart allows engineers to plot complex impedance values and perform calculations to solve transmission line problems.

9. What is single stub matching used for in transmission lines?

a) Impedance transformation
b) Voltage measurement
c) Power distribution
d) Current measurement

Answer: a) Impedance transformation

Explanation: Single stub matching is a technique used to transform the impedance seen at one point along a transmission line to a desired value.

10. What is the purpose of double stub matching in radio frequency engineering?

a) To increase power transmission efficiency
b) To decrease standing wave ratio
c) To achieve impedance matching
d) To eliminate voltage fluctuations

Answer: c) To achieve impedance matching

Explanation: Double stub matching is a method used to achieve impedance matching in transmission lines by adjusting the positions and lengths of two stubs.

11. What is the primary characteristic of a quarter-wave line?

a) Open circuit at one end
b) Short circuit at one end
c) Half the length of a half-wave line
d) Double the length of an eighth-wave line

Answer: b) Short circuit at one end

Explanation: A quarter-wave line is characterized by a short circuit at one end and an open circuit at the other end.

12. In microstrip lines, where are the conductive traces usually located?

a) Between two dielectric layers
b) Embedded within a dielectric substrate
c) Above a dielectric substrate
d) Below a dielectric substrate

Answer: c) Above a dielectric substrate

Explanation: In microstrip lines, the conductive traces are typically located above a dielectric substrate.

13. What is the analysis method often used for microstrip lines?

a) Transmission matrix analysis
b) Finite element method
c) Smith chart analysis
d) Moment method

Answer: b) Finite element method

Explanation: The finite element method is commonly used for the analysis of microstrip lines due to its versatility and accuracy.

14. What does a half-wave line typically require at its termination points?

a) Open circuit
b) Short circuit
c) Matching network
d) Variable resistor

Answer: a) Open circuit

Explanation: A half-wave line typically requires an open circuit at its termination points for proper operation.

15. What property distinguishes a dissipation-less line from a typical transmission line?

a) Higher power handling capacity
b) Lower propagation speed

c) Absence of resistive losses
d) Higher standing wave ratio

Answer: c) Absence of resistive losses

Explanation: The primary distinction of a dissipation-less line is the absence of resistive losses, leading to theoretically infinite propagation of signals without attenuation.