1. **A VSWR of 1 indicates:**

a) A perfectly matched line.
b) A completely mismatched line.
c) Maximum power transfer.
d) Both a and c. **Answer:** d)

2. **The input impedance of a transmission line terminated in a load impedance ZL is:**

a) ZL
b) Z0
c) Z0 [(ZL + jZ0 tan(βl)) / (Z0 + jZL tan(βl))]
d) ZL [(Z0 + jZL tan(βl)) / (ZL + jZ0 tan(βl))] **Answer:** c)

3. **The attenuation constant (α) represents:**

a) The loss of power or voltage along the transmission line.
b) The phase shift along the transmission line.
c) The reflection coefficient.
d) The VSWR. **Answer:** a)

4. **If the frequency is doubled, how does the skin depth change?**

a) Doubles
b) Remains the same
c) Decreases by a factor of √2
d) Increases by a factor of √2 **Answer: c)**

5. **If the transmission line length is an integer multiple of half-wavelengths, the input impedance will be:**

a) Equal to the load impedance
b) Infinite
c) Zero
d) Equal to the characteristic impedance
Answer: a)

6. **If the VSWR is 2, the reflection coefficient is approximately:**

a) 0.33
b) 0.5
c) 0.67
d) 1
Answer: a)

7. **A transmission line has a Z0 of 75 ohms and a load of 25 ohms. The VSWR is:**

a) 0.333
b) 3

c) 2
d) 1 **Answer:** b)

8. The purpose of impedance matching in a transmission line system is to:

a) Maximize power transfer to the load.
b) Minimize reflections.
c) Improve signal quality.
d) All of the above. **Answer:** d)

9. A normalized impedance Z=0.5+j0.5 is located in which region of the Smith Chart?

a) Right half-plane
b) Left half-plane
c) Upper half-plane
d) Lower half-plane
Answer: c) Upper half-plane

10. A quarter-wave transformer is used to:

a) Match impedance between two different transmission lines
b) Increase the frequency of signals
c) Act as a band-stop filter
d) Attenuate signals
Answer: a)

11. The center of the Smith chart represents:

a) ZL = 0
b) ZL = ∞
c) ZL = Z0
d) ZL = 2Z0 **Answer:** c)

12. A transmission line has a characteristic impedance (Z0) of 50 ohms and is terminated in a load impedance (ZL) of 100 ohms. The reflection coefficient (Γ) at the load is:

a) 0.333
b) 0.5
c) 1
d) -0.333 **Answer:** a)

13. A lossless transmission line has a Z0 of 50 ohms. If the input impedance at a certain point is 100 + j50 ohms, calculate the normalised impedance located on a smiths chart :

a) 2 + j1
b) 1 + j0.5
c) 0.5 + j0.25
d) 2 - j1 **Answer:** a)

14. A transmission line is terminated in a short circuit. What is the VSWR?

a) 1
b) Infinity
c) 2
d) 0
Answer b

15. A lossless transmission line has Vincident=10 V and Vreflected=2 V. What is the reflection coefficient?

a) 0.1
b) 0.2
c) 0.3
d) 0.4 **Answer:** b) 0.2

16. A normalized impedance Z=1+j0 is located at which point on the Smith Chart?

a) The leftmost point
b) The rightmost point
c) The center
d) The topmost point
Answer: c) The center

17. A load has a normalized impedance ZL=2+j1. What is the corresponding normalized admittance YL?

a) 0.4−j0.20.4−j0.2
b) 0.5−j0.50.5−j0.5
c) 0.2−j0.40.2−j0.4
d) 0.3−j0.30.3−j0.3 **Answer:** a)

18. When moving along a transmission line towards the load, what happens to the reflection coefficient?

a) Increases
b) Decreases
c) Remains the same
d) Becomes negative
Answer: c) Remains the same

19. What happens to the reflection coefficient when a quarter-wave transformer is used for matching?

a) It is minimized
b) It is inverted
c) It is increased
d) It is eliminated completely
Answer: b) It is inverted

20. How is the Smiths chart different for Admittance and Impedance calculations:

a) Shifted clockwise by 90°
b) Shifted anti-clockwise by 90°
c) Shifted by 180°
d) No change **Answer:** c)