

ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH.DEGREE EXAMINATIONS : MAY/JUNE 2010

REGULATIONS : 2007

FOURTH SEMESTER : ECE

070290038 - TRANSMISSION LINES AND WAVEGUIDES

Time : 3 Hours

Max. Marks : 100

PART – A

(20 x 2 = 40 Marks)

ANSWER ALL QUESTIONS

1. What is meant by reflection loss and insertion loss in a transmission line.
2. Draw the equivalent circuit of transmission line.
3. What is meant by reflection loss and insertion loss in a transmission line.
4. Define node and antinodes.
5. Define Skin effect.
6. Find the VSWR and Reflection coefficient of perfectly matched line with no reflection from load.
7. Give the expression that relates phase velocity, group velocity and free space velocity.(C)
8. What is the cutoff frequency of TEM wave.
9. Why the TE₁₀ wave is called as dominant wave in rectangular wave guide.
10. What is cavity resonator.
11. Define the characteristic impedance of a transmission line.
12. Define standing wave ratio.
13. What are the characteristic of TEM wave.
14. Impedance measurements on a transmission line operates at 5 KHz have $Z_{oc}=141.9L 84.1\Omega$; $Z_{sc}=62L 37.7 \Omega$ length of 2 miles find Z_0 .

15. Define the quality factor of a resonator.
16. Define Wave impedance.
17. Distinguish between TE and TM waves.
18. Which is the dominant mode in circular wave guide.
19. Why TEM wave is not possible for rectangular wave guide.
20. What are constant S circles.

PART – B

(5 x 12 = 60 Marks)

ANSWER ANY FIVE QUESTIONS

21. Obtain the general solution of transmission
22. Discuss the two types of waveform distortion on a transmission line and obtain the condition for distortion less line.
23. Explain single stub matching on a transmission line and derive the expression and the length of the stub used for matching on a line.
24. A TE₁₀ mode is propagate through a wave guide with $a=10\text{cm}$ at a frequency of 2.5 GHZ .Find cutoff wavelength ,phase velocity, group velocity and wave impedance.
25. A transmitter feeds a halfwave dipole antenna with a resistance of 72 ohms through a lossless feeder with air dielectric and characteristic impedance 300 ohm. The signal frequency is 150 Mhz. Design a single stub match to match the line to the load.

26. Derive the field configuration, cutoff frequency and velocity of propagation for TM waves in rectangular wave guide.
27. Derive the Q factor of a rectangular cavity resonator for TE₁₀₁ mode.
28. Derive the expression for the field component of TE waves between parallel plates propagating in Z direction.

*****THE END*****