

## Antenna Wave And Propagation (BTETC601) Question Bank

1. Derive the fundamental equation for free space propagation (Friis Equation) and explain each parameter of it.
2. Sketch the structure of atmosphere and explain each layer, significance of all.
3. What are the Ionospheric abnormalities and how do they effect wave propagation?
4. Define the terms virtual height, maximum usable frequency and their relevance in wave propagation
5. A wave originates from the transmitting antenna with 10 dB gain and 100 watts radiating power at 10 MHz. It is received by an antenna with 15 dB gain located at 20 km distance, calculate received Power.
6. A radio communication link is to be established via Ionosphere. Consider maximum virtual height to be 100 km at the point of path. Let the critical frequency to be 2 MHz Distance is 600 km, find the Maximum Usable Frequency.
7. Explain the mechanism of radio wave by bending by the Ionosphere with suitable diagrams and mathematical expressions.
8. Draw and Explain Multi-hop propagation.
9. Explain Space link geometry
10. What is Fading effect? What are different types of Fading?
11. Derive wave equation in general conducting medium
12. Derive wave equation for perfect dielectric medium.
13. Derive reference of plan wave at normal incidence
14. Radial comp. of radiated power density of antenna is given by  $W_{rad} = A_0 \sin\theta$ . Find total radiated power.
15. Define virtual height, MUF and relevance in wave prop.
16. Short note on Beam width and directivity
17. Derive radiation power density.
18. Explain the Infinitesimal dipole antenna.
19. Analysis the small dipole antenna.
20. Analysis the small circular loop antenna.
21. Derive the Vector potential for an electric current source.
22. Derive the Electric and magnetic field for electric(J) and magnetic(M) current source.
23. Derive the solution of the inhomogeneous vector potential wave equation.
24. Explain the Broadside array
25. Explain End Fire Array
26. Derive the Array with n Sources of Equal amplitude and spacing.
27. Explain the array Factor
28. Explain the Yaggi Uda Antenna .
29. A Broadside array of antenna consist of 8 isotropic radiator spaced a distance  $\lambda / 2$  apart. Find Major Lobe and Nulls.in plane containg the line of array showing direction of maxima .
30. Calculate Directivity and gain of linear broadside and End Fire array having Isotropic Elements Separated by Distance of  $\lambda / 4$ .
31. Calculate the length off dipole ,Reflector,Director1,Director2,Director3 along with the spacing between the element for channel five[VHF=III the frequency band for Cjchannel Five is 174MHz to 181MHz.
32. Write the short note on Antenna Parameters
33. Draw and explain V antenna.
34. Explain Horn antenna.
35. Draw and explain Helical antenna.