Question Bank

BRANCH: ECE

SEM: V

SUBJECT: AWP

- 1. Explain antenna action. Define any of its four parameters.
- 2. An antenna has an effective height of 10m and the current at the base is 450A (rms) at 50 kHz. Calculate the power radiated. If the total resistance of the antenna system is 1.5 ohm find out the efficiency of the antenna.
- 3. How retarded potentials are useful in deriving the radiated field due to any antenna?
- 4. Show that the directivity of an alternating current element is 1.76dB.
- 5. Find the Gain, beam width and capture area for a parabolic antenna with a 6 m diameter dish and dipole fixed at a frequency of 10 GHz.
- 6. Classify various type of antenna array with example.
- 7. Derive and draw the radiation pattern of two isotropic sources separated by a distance $\lambda/4$ with an initial phase of 90 degree.
- 8. With the help of pattern multiplication draw the radiation pattern of 4 element isotropic array separated by $\lambda/2$ with the initial phase of 0 degree among them.
- 9. Design Yagi-Uda antenna of 6 elements of provide gain of 10 dB if the operating frequency is 200 MHz.
- 10. Derive the radiation resistance of a $\lambda/2$ antenna.
- 11. Derive the field component of short electric dipole.
- 12. Design a helical antenna operating in the axial mode that gives a directivity of 14 dB at 2.4 GHz. For this antenna, calculate the input impedance, half power beamwidth, BWFN, and the axial ratio.
- 13. Determine the directivity of a loop antenna whose radius is 0.5m, when it is operated at 0.9MHz. Explain two of its applications.
- 14. Design a log periodic dipole array having a $\tau = 0.895$ and $\sigma = 0.166$ over a frequency range of 10 MHz to 30 MHz.

- 15. Why we use term modified refractive index in propagation of radio waves. In which type of propagation it is valid and what is its value?
- 16. Explain the structure of ionosphere. Explain any two parameters of sky wave propagation.
- 17. What is troposphere? Explain the mechanism of wave propagation in this region.
- 18. Explain the structure of Ionosphere in detail.
- 19. Explain Helical antenna with its mode of operation.
- 20. Derive the field component of short electric dipole.
- 21. Discuss the mechanism of Ground wave and Space wave propagations
- 22. What is troposphere? Explain the mechanism of wave propagation in this region.
- 23. Relate maximum usable frequency with skip distance. Calculate the MUF for flat earth with critical frequency of 2×10^{6} Hz and virtual height is 100 Km. the distance b/w two stations is 500 Km.
- 24. Derive the radiation resistance of an $\lambda/2$ antenna.
- 25. Find out and plot the relative field pattern of two isotropic point source of same amplitude and opposite phase separated by a distance $d = \lambda$.
- 26. Discuss Yagi-Uda antenna design with its advantages and applications.
- 27. How loop antenna is used for direction finding and how it determines the correct direction?
- 28. Design a Log Periodic Antenna. Calculate the apex angle for τ =0.985 and σ =0.156.
- 29. Find out the field component of rectangular loop antenna of length 'a' and width 'b'.
- 30. With the help of a diagram explain ray path, skip distance, maximum usable frequency.
- 31. Compare broadside and end fire array antenna.
- 32. Briefly explain sky wave or ionosphere wave propagation.
- 33. Derive the radiation resistance of short electric dipole.
- 34. Explain ground wave propagation with the help of a neat diagram.

- 35. What is a broadside array? Deduce an expression for the radiation pattern of a broadside array with n vertical dipoles. Plot radiation pattern in 1) vertical and 2) horizontal plane.
- 36. Write down the factor influencing the propagation of radio waves.
- 37. Write a short note on thin linear antenna array.
- 38. Write a short note on Yagi Uda antenna.
- 39. Define driven and parasitic elements of antenna arrays.
- 40. Explain the concept of point source of an isotropic radiator and also explain the radiation intensity of that (Power theorem).
- 41. Write a short note on the classification of antenna arrays.
- 42. Find out and plot the relative field pattern of two isotropic point source of same amplitude and same phase separated by a distance of $\lambda/2$.
- 43. Find out and plot the relative field pattern of two isotropic point source of same amplitude and same phase separated by a distance of $\lambda/2$.
- 44. Find out and plot the relative field pattern of two isotropic point source of same amplitude and opposite phase separated by a distance of $\lambda/2$.
- 45. Find out and plot the relative field pattern of two isotropic point source with unequal amplitude and any phase separated by a distance.
- 46. Explain the principle of pattern multiplication.
- 47. Find the location of the first nulls on either side of the beam center for linear array of 80 degree inphase elements fed with equal amplitude current, which are $\lambda/2$ apart.
- 48. A broadside array operating at 0.1 m wavelength consists of 4 half wave dipoles spaced 50cm.each element carries RF current in the same phase and magnitude 0.5 Amp. Calculate a) power radiated b) HPBW of the major lob
- 49. Define the following parameters w.r.t antenna: Direct Gain. Isotropic radiator Beam area.
- 50. Derive the relation between half power beam width and first null beam width.

- 51. Derive the relation between directivity and beam solid angle.
- 52. Compare broadside and end fire array antenna.
- 53. What is a broadside array? Deduce an expression for the radiation pattern of a broadside array with n vertical dipoles. Plot radiation pattern.
- 54. What is antenna array, point source linear and nonlinear array?
- 55. Write a short note on Yagi Uda antenna.
- 56. Define driven and parasitic elements of antenna arrays.
- 57. Define broad side array with the help of the diagram.
- 58. Compare broadside and end fire array antenna.
- 59. Find the location of the first nulls on either side of the beam center for linear array of 80 degree in phase elements fed with equal amplitude current, which are $\lambda/2$ apart.
- 60. Explain folded dipole Antenna.
- 61. Define a) Radiation Intensity b) Gain and Directivity of an antennac) Effective area.
- 62. Explain retarded potentials of antenna.
- 63. Evaluate radiation resistance of an element of length L = 1m at an operating freq. of 10 MHz.
- 64. Explain antenna temperature and antenna impedance in short.
- 65. Derive Friss Transmission formula or Radio Communication link.
- 66. Write short note on field of an oscillating dipole.
- 67. Show that the maximum effective aperture of a short dipole antenna is 0.119λ .
- 68. Find efficiency and total resistance of $\lambda/40$ dipole antenna if loss resistance is 0.8Ω .
- 69. What is antenna array, point source linear and nonlinear array?