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Code No: 156AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, August/September - 2021

AG AG
Time: 3 Hours

ANTENNAS AND PROPAGATION
(Electronics and Communication Engineering)

AG AG
Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Develop the expressions for electric and magnetic field components of quarter wavelength monopole antenna.
b) Draw and explain the radiation pattern of Monopole antenna in principal planes. [10+5]

- 2.a) Develop the expressions for electric and magnetic field components of hertz antenna.
b) Radiation intensity of particular antenna is given by $U=U_0\sin^2\theta$. Calculate directivity.
[10+5]

- 3.a) For a non uniform broadside linear array derive the expression for array factor if the array has (i) even number of elements and (ii) odd number of elements.
b) Explain the procedure to measure directivity of antenna.
[10+5]

- 4.a) Solve for directivity of End Fire Array antenna.
b) If the test antenna is circularly polarized. Discuss how gain measurement is accomplished using the gain-transfer method.
[7+8]

- 5.a) Explain the characteristics of folded dipoles.
b) Brief out the operating principle of Yagi-Uda Antenna.
[10+5]

- 6.a) Discuss the Helix modes of Helical Antenna.
b) Consider an array of 2 Isotropic Sources. Find the resultant electric field and perform a case study for distance between elements $d = \lambda/2$, $d = \lambda/2$ when the antennas are fed with currents of same amplitude and phase.
[8+7]

- 7.a) Explain the radiation mechanism in microstrip antenna using transmission line model analysis.
b) With the help of Cassegrain feed geometry, explain the operation of parabolic reflector antenna.
[8+7]

- 8.a) Derive the expression for skip distance.
b) Estimate the mechanism of space wave propagation over ideal flat earth with a neat sketch.
[8+7]

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