Reg. No. : | | | | | | | | | |

## Question Paper Code: 31463

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Sixth Semester

Electronics and Communication Engineering

01UEC603 - ANTENNA AND WAVE PROPAGATION

(Regulation 2013)

Duration: Three hours                                                    Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define half power beam width.

2. Define the term steradian.

3. Summarize the conditions to obtain end fire array.

4. Calculate the radiation resistance of an antenna which is drawing 15 ampere current and radiating 5kW.

5. Calculate the power gain of an optimum horn antenna approximately with a square aperture of $10\lambda$ on a side.

6. Point out the merits and demerits of lens antenna.

7. List out the characteristics of Yagi-Uda antenna.

8. Give the features of anechoic champer.

9. Define the Faradays rotation.

10. Measure the critical frequency for reflection at vertical incidence if the maximum value of electron density is $1.24 \times 10^6$ cm$^{-3}$.

PART - B (5 x 16 = 80 Marks)

11. (a) Define Hertzian dipole? Explain the electric and magnetic field quantities of Infinitesimal dipole and radian pattern.                                    (16)

(b) (i) Explain in detail retarded vector potential and scalar potential. (8)

(ii) Discuss in detail on the following

(1) Antenna temperature (2) Polarization (8)

12. (a) Estimate the maxima, minima and beam width of a broadside array. (16)

Or

(b) Define an Half wave dipole antenna? Give the expression for radiated fields of a half wave dipole antenna and the radiated resistance for the same. (16)

13. (a) Discuss about the type of Horn antenna and find the directivity and power gain. (16)

Or

(b) (i) Calculate the beam width between first nulls of a 2.5m paraboloid reflector used at 6 GHZ. What will be its gain in decibels. (8)

(ii) Calculate the angular aperture for a paraboloid reflector antenna for which aperture number is i)0.25, ii) 0.50. Given that diameter of the reflector mouth is 10m , Calculate the position of the focal point with reference to the reflector mouth in each case. (8)

14. (a) Describe the construction and basic principle of operation of a helical antenna under i) normal mode of operation and ii) Axial mode of operation. What is its application. (16)

Or

(b) Explain how the radiation pattern, Directivity and gain of the given antenna measured experimentally. (16)

15. (a) Summarize the structure of the ionosphere and explain the phenomena of wave bending introduced by these layers. (16)

Or

(b) Discuss on the following

(i) Skip Distance (8)

(ii) Virtual Height (8)

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