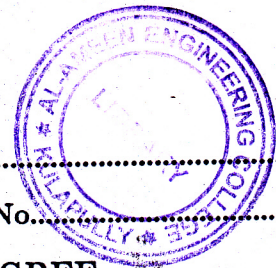


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Name.....

Reg. No.....



**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, MAY 2012**

EC 09 603—RADIATION AND PROPAGATION

(2009 admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

*Answer all questions.
Each question carries 2 marks.*

1. What is front-to-back ratio in an antenna ?
2. State pattern multiplication.
3. What are the disadvantages of binomial array ?
4. What are the different modes of operation of helical antenna ?
5. Define skip distance.

(5 × 2 = 10 marks)

Part B

*Answer any four questions.
Each question carries 5 marks.*

1. Given that the radiated power density of an antenna is $W_{rad} = \sin^2\theta \text{ W/m}^2$ Find the directivity of the antenna.
2. Write in brief how polarization of an antenna is found using Poynting sphere.
3. Explain in brief the operation of continuous arrays.
4. What are the various effects of antenna height ?
5. Draw the structure of ionosphere during day and during night.
6. Explain in brief with diagram duct propagation.

(4 × 5 = 20 marks)

Part C

*Answer all questions.
Each question carries 10 marks.*

1. Derive the expression for antenna temperature.

Or

2. Given that the radiation intensity of an antenna is $U = \sin^2\theta \sin^2\phi$, $0 < \theta < \pi/2$ and $0 < \phi < \pi/2$. Find the directivity and maximum effective aperture.

Turn over

3. Derive the expression for directivity of an end-fire array.

Or

4. Determine the optimum pattern for a Dolph-Chebyshev array of 9 elements with all the elements equally spaced with spacing $\lambda/2$. The sidelobe level down to the mainlobe level is 20 dB.

5. Derive the expression for electric field intensity due to a long wire antenna.

Or

6. Explain the operation of Yagi-Uda antenna with folded dipole as driven element and derive the expression for impedance of folded dipole in terms of half-wave dipole.

7. Discuss the vertical and oblique incidence of sky waves with necessary equations.

Or

8. Explain the spacewave propagation with necessary diagrams.

(4 × 10 = 40 marks)

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