

C 80757

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Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) (09 SCHEME)
DEGREE EXAMINATION, APRIL 2015**

EC/PTEC 09 603—RADIATION AND PROPAGATION

Time : Three Hours



Maximum 70 Marks

Part A

Answer all questions.

Each question carries 2 marks.

1. Define Radiation Intensity.
2. What is meant by mutual impedance of an antenna ?
3. Define end-fire array and draw its radiation pattern.
4. Give two applications of medium frequency antennas.
5. What is selective fading ?

(5 × 2 = 10 marks)

Part B

Answer any four questions.

Each question carries 5 marks.

1. Derive the expression for beam solid angle interms of radiation intensity.
2. Find the power radiated by an antenna with radiation intensity $U = \sin \theta \sin \phi$, $0 < \theta < \pi/2$ and $0 < \phi < \pi/2$.
3. What are binomial arrays ? How the current amplitudes are found for the antenna elements in binomial array ?
4. Write in brief the effects of ground on antenna performance.
5. Draw the structure of 3-element Yagi-Uda antenna and mark its dimensions interms of wavelength.
6. Explain in brief diversity reception.

(4 × 5 = 20 marks)

Part C

Answer all questions.

1. Derive the expression for power radiated from an infinitesimal dipole.

Or

2. Find the directivity and maximum effective aperture of an antenna with radiation intensity $U = B_0 \cos^3 \theta$, $0 < \theta < \pi/2$ and $0 < \phi < \pi$.

Turn over

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

Or

4. Given that for a Dolph Chebychev array of 7 elements, the spacing between the adjacent elements is $\lambda/2$ and the sidelobe level down the mainlobe level is 26 dB. Find the optimum pattern.

5. Explain the operation of V antenna and inverted V antenna with necessary diagrams.

Or

6. Explain the operation of microstrip patch antenna and its design procedure.

7. Explain the reflection and refraction of waves by ionosphere.

Or

8. Explain surface wave propagation and derive the expression for ground wave attenuation factor.

(4 × 10 = 40 marks)