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Question Paper Code :

**ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)**

M.E/M.Tech I-Semester Regular Examinations, November 2015

Satellite Communication and Phased Arrays

(Communication Systems)

Date:

Time: 3 hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

Duration: 3 Hrs

Marks: 60M

All Questions Carry Equal marks

Each UNIT contains two choice questions out of which one has to be answered

UNIT-I

1. a) State Kepler's three laws of planetary motion. Illustrate in each case their relevance to artificial satellites orbiting the earth. [7M]
- b) Draw the block diagram of TT&C and explain its blocks. [5M]

(or)

2. a) Explain orbital effects in communication system performance. [3M]
- b) Explain in detail about antenna look angles. [4M]
- c) A satellite is in an elliptical orbit with a perigee of 1225km & apogee of 4500km using a mean earth radius of 6378.14km. Find the period of the orbit in hours, minutes & seconds & find the eccentricity of the orbit. [5M]

UNIT-II

3. a) Define multiple access techniques? Give in detail about the comparisons of multiple access techniques? [6M]
- b) Write a short note about the FDMA message transmission based on M/G/1 queue. [6M]

(or)

4. a) Explain the principle behind spectrum spreading and despreading and how this is used to minimize interference in a CDMA system. [6M]
- b) Explain the satellite packet switching based on slotted ALOHA. [6M]

UNIT-III

5. a) Explain the basic components of an earth station technology with the help of a block diagram. [7M]
b) Explain about the direct broadcasting of satellite television. [5M]

(or)

6. a) Explain the parameters that control the design of the earth station. [6M]
b) Explain briefly about frequency considerations. [6M]

UNIT-IV

7. a) Describe the system requirements for radar and communication antennas [5M]
b) Explain about Directive Properties of Arrays [7M]

(or)

8. a) discuss briefly about Array Noise Characterization. [6M]
b) The total power received for the Receiving Antenna in a Polarized Plane Wave Field [6M]

UNIT-V

9. a) What are the Fundamental Results from Array Theory you have observed explain briefly. [8M]
b) Discuss about Beam width and Directivity of Scanning Arrays. [4M]

(or)

10. a) Describe briefly about EIRP and G/T for Large in determining the array size. [6M]
b) Explain how the Phase Scanning in One Dimension ($\theta_0 = 0$) . [6M]