Subject Code : P8AP10

CORE COURSE - X - COMMUNICATION SYSTEMS

Unit I- Communication system

Theory of amplitude modulation – Theory of frequency modulation – Theory of phase modulation. Noise: Internal noise-External noise-noise calculation – noise figure-noise temperature-Antennas: antenna equivalent circuits-coordinate system-radiation fields –Polarization-power gain of Antenna-Hertzian dipole-Half wave dipole-Vertical antenna-Loop ferrite rod antenna-non-resonant antenna-driven array Parastic arrays-UHF-VHF antenna-microwave antenna.

Unit II -Digital Communication

Pulse amplitude modulation-pulse code modulation- delta modulation-Pulse frequency modulation-pulse time modulation-pulse position modulation-pulse width modulation –digital carrier systems – Amplitude shift keying- Frequency shift keying- Phase shift keying- differential and quadrapolar phase shift keying- error control coding-multiplex transmission-frequency and time division multiplexing.

Unit III- Microwaves and Radar communication

Generation of microwaves- Klystron: Reflex Klystron- Multicavity Klystron-Magnetron-detection of microwaves-IMPATT, TRAPATT and Gunn diodes – Radar-radar equation-Pulse and CW radar –MTI and automatic tracking radar.

Unit IV- Optic fiber Communication

Fiber optics-Different types of fiber: Step index and Graded index fibers- signal degradation fibers: Absorption, attenuation, Scattering losses and dispersion-Optical sources and detectors (quantitative only) - Power launching and coupling: Source to fiber launching -fiber joints- Splicing techniques- general optical communication system

Unit V- Satellite and Cellular communication

Satellite links -Eclipses- orbits and inclination- satellite construction –Satellite communication frequencies-Different domestic satellites-Intelsat system-MARISAT satellites-telemetry- Cellular concept- Multiple Access Cellular Systems- Cellular system Operation and Planning-General Principles- analog cellular systems- Digital Cellular mobile Systems- GSM- CDMA- Cellular standards.

Books for Study

1. Dennis Roddy and John Coolen, Electonic communication-fourth edition, PHI private Ltd, (1999). (Unit I, II & V)

2. G. Kennedy and Davis, Electronic communication system, TMH, New Delhi, (1999). (Unit-III)
3. Gerd Keiser, Optical Fiber Communication, Third Edition, McGraw-Hill, Singapore, (2000). (Unit IV)
4. Raj Pandya, Mobile and Personal Communication Services and Systems, Prentice Hall of India Private Ltd., New Delhi, (2003). (Unit V)

Books for Reference

1. Sanjeev Gupta, Electronic Communication Systems, Khanna publications, New Delhi, (1995).
2. N.D.Deshandae, P.K Rangole, Communication Electronics, Tata McGraw Hill Pvt.Ltd, (1998).
3. M. Arumugam, Optical Fiber Communication and Sensors, Anuradha Agencies, Kumbakonam, (2002).