AMEI-25 ANTENNA AND WAVE PROPAGATION

UNIT-1 ANTENNA PRINCIPLES

1.1 Potential functions & Electromagnetic field,
1.2 Current Elements, Radiation from Monopole& Half Wave Dipole,
1.3 Power radiated by current element, radiation resistance.
1.4 Network Theorems Directional Properties of Dipole Antenna.
1.5 Antenna Gain, Effective Area, Antenna Terminal impedance,
1.6 Practical Antennas and Methods of Excitation,
1.7 Antenna Temperature and Signal. To Noise Ratio.

UNIT-2 ANTENNA ARRAYS

2.1 Two Element Array,
2.2 Horizontal Patterns in Broadcast Arrays, Linear Arrays,
2.3 Multiplication of Patterns,
2.4 Effect of the earth on vertical patterns, Binomial array.

UNIT-3 WAVE PROPAGATION

3.1 Modes of Propagation, Plane Earth Reflection.
3.2 Space wave and Surface Wave,
3.3 Reflection and refraction waves by the lonosphere Tropospheric Wave.
3.4 Ionosphere Wave Propagation in the Inosphere, Virtual Height ,
3.5 MUF Critical frequency,
3.6 Skip Distance, Duct Propagation, Space wave.

UNIT-4 PRACTICAL ANTENAS

4.1 VLF and LF transmitting antennas, effect of antenna height,
4.2 Field of short dipole, electric field of small loop antenna,
4.3 Directivity of circular loop antenna with uniform current,
4.4 Directivity of Circular loop antenna with uniform current,
4.5 Yagi-Uda array: Square corner yagi-udahybride, circular polarization Rhombic Antenna Weight and Leg length Parabolic Reflectors Properties,
4.6 Comparison with corner reflectors Horn Antenna: Length and Aperture.
4.7 Introduction to Turstile Antenna Effect of ground on antenna performance.
4.8 Broadband Antenna: Frequency independent concept,
4.9 RUMSEY'Ss Principle, Frequency independent planarlog spiral antenna,
4.10 Frequency independent conical spiral Antenna.

Reference Books:

1. Prasad, K.D./ "Antennas and Wave Propagation" /Khanna Publications.
2. Collin, R./ "Antennas and Radio wave Propagation" /Tata McGraw-Hill
3. Hayt Jr. William H./ "Engineering Electromagnetics"/Tata McGraw-Hill.
4. Das, Annaparna& Das, Sisir K. / "Microwave Engineering"/Tata McGraw Hill.