SEMESTER V
TRANSMISSION LINES AND WAVEGUIDES

(COMMON FOR ECE & ETCE)

UNIT – 1 FILTERS **9**

The neper - the decibel - Characteristic impedance of Symmetrical Networks – Current and voltage ratios - Propagation constant, - Properties of Symmetrical Networks – Filter fundamentals – Pass and Stop bands. Behavior of the Characteristic impedance. Constant K Filters - Low pass, High pass band, pass band elimination filters - m - derived sections – Filter circuit design – Filter performance – Crystal Filters

UNIT - 2 TRANSMISSION LINE PARAMETERS **9**

A line of cascaded T sections - Transmission lines - General Solution, Physical Significance of the equations, the infinite line, wavelength, velocity, propagation, Distortion line, the telephone cable, Reflection on a line not terminated in Zo, Reflection Coefficient, Open and short circuited lines, Insertion loss.

UNIT – 3 THE LINE AT RADIO FREQUENCY **9**

Parameters of open wire line and Coaxial cable at RF – Line constants for dissipation - voltages and currents on the dissipation less line - standing waves – nodes – standing wave ratio - input impedance of open and short circuited lines - power and impedance measurement on lines – ***f*Ü** / 4 line, Impedance matching – single and double-stub matching circle diagram, smith chart and its applications – Problem solving using Smith chart.

UNIT – 4 GUIDED WAVES BETWEEN PARALLEL PLANES **9**

Application of the restrictions to Maxwell's equations – transmission of TM waves between Parallel plans – Transmission of TE waves between Parallel planes. Transmission of TEM waves between Parallel planes – Manner of wave travel. Velocities of the waves – characteristic impedance - Attenuators

UNIT – 5 WAVE GUIDES **9**

Application of Maxwell's equations to the rectangular waveguide. TM waves in Rectangular guide. TE waves in Rectangular waveguide – Cylindrical waveguides. The TEM wave in coaxial lines. Excitation of wave guides. Guide termination and resonant cavities.

TUTORIAL-15 HOURS **TOTAL= 60 HOURS**

TEXT BOOKS

1.John D.Ryder, "Networks, lines and fields", Prentice Hall of India, 2nd Edition, 2006.

REFERENCE BOOKS

1. E.C.Jordan, K.G. Balmain: "E.M.Waves & Radiating Systems", Pearson Education, 2006.
2. Joseph Edminister, Schaum's Series,"Electromagnetics, TMH, 2007.
3. G S N Raju, Electromagnetic Field Theory and Transmission Lines, Pearson Education, 2006.
4. Ramo, Whineery and Van Duzer: "Fields and Waves in Communication Electronics", John Wiley, 2003.