EC6503 TRANSMISSION LINES AND WAVE GUIDES

DETAILED SYLLBUS

OBJECTIVES:

- To introduce the various types of transmission lines and to discuss the losses associated.
- To give thorough understanding about impedance transformation and matching.
- To use the Smith chart in problem solving.
- To impart knowledge on filter theories and waveguide theories

UNIT I TRANSMISSION LINE THEORY

General theory of Transmission lines - the transmission line - general solution - The infinite line - Wavelength, velocity of propagation - Waveform distortion - the distortion-less line - Loading and different methods of loading - Line not terminated in Z0 - Reflection coefficient - calculation of current, voltage, power delivered and efficiency of transmission - Input and transfer impedance - Open and short circuited lines - reflection factor and reflection loss.

UNIT II HIGH FREQUENCY TRANSMISSION LINES

Transmission line equations at radio frequencies - Line of Zero dissipation - Voltage and current on the dissipation-less line, Standing Waves, Nodes, Standing Wave Ratio - Input impedance of the dissipation-less line - Open and short-circuited lines - Power and impedance measurement on lines - Reflection losses - Measurement of VSWR and wavelength.

UNIT III IMPEDANCE MATCHING IN HIGH FREQUENCY LINES 9

Impedance matching: Quarter wave transformer - Impedance matching by stubs - Single stub and double stub matching - Smith chart - Solutions of problems using Smith chart - Single and double stub matching using Smith chart.

UNIT IV PASSIVE FILTERS

Characteristic impedance of symmetrical networks - filter fundamentals, Design of filters: Constant K - Low Pass, High Pass, Band Pass, Band Elimination, m- derived sections - low pass, high pass composite filters.

UNIT V WAVE GUIDES AND CAVITY RESONATORS

General Wave behaviours along uniform Guiding structures, Transverse Electromagnetic waves, Transverse Magnetic waves, Transverse Electric waves, TM and TE waves between parallel plates, TM and TE waves in Rectangular wave guides, Bessel's differential equation and Bessel function, TM and TE waves in Circular wave guides, Rectangular and circular cavity Resonators.

TEXT BOOKS

1. John D Ryder, “Networks, lines and fields”, 2nd Edition, Prentice Hall India, 2010.

REFERENCES

1. E.C.Jordan and K.G. Balmain, "Electromagnetic Waves and Radiating Systems", Prentice Hall of India, 2006.

2. G.S.N Raju "Electromagnetic Field Theory and Transmission Lines" , Pearson Education, First edition 2005.

Click below link to download EC6503 Transmission Lines and Wave Guides Study Materials . EC6503 Transmission lines and wave guides syllabus regulation 2013. Unit I time varrying fields and maxwellâ€™s eqution s.Â Wave propagation in free space, Wave propagation in dielectrics, Forward and Backward Travelling Wave, Poynting Theorem and Wave Power, Energy of the Radiated wave, Propagation in good conductors and good dielectrics, Skin effect, Wave polarization, Linearly, Elliptically and Circularly polarized waves. Unit IV transmission and reflection of plane waves at boundaries. Communication engineering. EC6503 Transmission lines and waveguides. Year / semester: III / V. Academic year: 2015-2016(odd semester).Â transmission line equations. 8 (i) Discuss the reflection coefficient of different transmission lines. ii) A transmission line operating at 10 rad/s has = 8 d B/m, = 1 rad/m. and z= 60+ j40ohms, and is 2meter long. The line is connected to a source of 10 v, Zg=40ohms and terminated by a.Â 14. How is the TE mode launched or initiated in rectangular wave guide using an open ended coaxial cable? 15. List parameters of the open wire line at High frequency. 16. A line having characteristics impedance 50 ohm is terminated in the load impedance 75+j75 ohm. The transmission of energy in the line occurs totally through the dielectric inside the cable between the conductors. Coaxial lines can therefore be bent and twisted (subject to limits) without negative effects, and they can be strapped to conductive supports without inducing unwanted currents in them. In radio-frequency applications up to a few gigahertz, the wave propagates in the transverse electric and magnetic mode (TEM) only, which means that the electric and magnetic fields are both perpendicular to the direction of propagation (the electric field is radial, and the magnetic field is ci SCE Dept. of ECE. EC6503. Transmission lines and waveguides. 2.5 Power and impedance measurement on lines 2.6 Reflection losses 2.7 Measurement of VSWR and wavelength. 32 34 36.Â General Wave behaviours along uniform, Guiding structures, transverse Electromagnetic waves, Transverse Magnetic waves, Transverse Electric waves, TM and TE wave between parallel plates, TM and TE waves in Rectangular wave guides, Besselâ€™s differential equation and Bessel function, TM and TE waves in Circular wave guides, Rectangular and circular cavity resonators. SCE Dept. of ECE. EC6503. Transmission lines and waveguides. OUTCOMES: Upon completion of the course, students will be able to Download link is provided and students can download the Anna University EC6503 Transmission Lines and Wave Guides (TLWG) Syllabus Question bank Lecture Notes Syllabus Part A 2 marks with answers Part B 16 marks Question Bank with answer, All the materials are listed below for the students to make use of it and score good (maximum) marks with our study materials. â€œEC6503 Transmission Lines and Wave Guides (TLWG) Notes,Lecture Notes, Previous Years Question Papersâ€. â€œEC6503 Transmission Lines and Wave Guides (TLWG) Important 16 marks Questions with Answersâ€. â€œEC6503 Transmission Lines and Wave G...