



EC3551 – TRANSMISSION LINES & RF SYSTEMS

UNIT 1:

PART -B

- General Transmission line equation for voltage & current point
- **General theory of Transmission lines**
- Loading & types of loading of lines
- Waveform distortion & condition for distortion
- **Open & Short Circuited impedance**
- Reflection factor & reflection loss & expressions

PART -A

- **Transmission line / Reflection Loss**
- **Condition of distortion less line**
- Primary constants of a transmission line
- **Infinite line / Reflection factor**
- **Characteristic Impedance**

UNIT 2:

PART -B

- **Lossless & distortion less transmission lines**
- Derive the Constants of a zero dissipation less line
- **VSUR & wave length of the line**
- **Transmission line equations at radio frequencies**
- variation of input impedance along open & short circuit lines with relevant Graphs





PART -A

- **Standing Wave Ratio / Line of Zero dissipation**
- Standing wave ratio & reflection coefficient
- **Reflection coefficient, reflection loss, insertion loss**
- Compare SWR $Z_R=0$ & $Z_R=Z_0$
- Line constants of zero dissipation loss line / **Reflection losses**

PART -C

- Give the Expressions for Voltages Current at any point on the radio frequency dissipation less line obtain the expression for the same for different receiving end conditions

UNIT 3:

PART -B

- **Double / Single stub matching of a transmission line with example**
- **Operation & Application of Quarter wave transformer**
- Expression for I/f Impedance of a Quarter wave transforms & its applications

PROBLEM

- Solved Problem using smith chart

PART -A

- **Application of Smith chart / Advantages**
- **Impedance Matching / Half wave line**
- Single Stub Matching & Double Stub Matching
- **Application of Quarter Wave Line / One Eighth wave line**
- **Stub used in transmission line**
- Nodes & Anti nodes





UNIT 4:

PART -B

- Propagation of TE wave between Parallel Planes & Derive Expression for Electric & Magnetic Fields
- Derive Expression of TM wave between parallel Perfectly conducting plates for field components
- TE waves in Rectangular Wave Guides
- Equation of TE & TM waves in Circular Wave Guides

PART -A

- Cutoff frequency & cutoff wavelength
- Characteristics of TE & TM waves
- Compare TE & TM mode
- TEM wave / Cairly resonators
- Phase velocity & group velocity

UNIT 5:

PART -B

- Design of Power Amplifiers
- Principle & Working of Field effect Transistors
- FET at RF Frequencies
- Low noise amplifier
- RF amplifiers & impedance matching

PART -A

- Types of Mixer / RF components
- Bipolar junction transistor
- Oscillator & mixer / Couplers
- Power Dividers / Amplifier power relations
- Transducer power / RF power amplifier



IMPORTANT QUESTIONS – UNIT 1

1. General theory or solution of Transmission line/infinite line or this question may ask derive the current and voltage equation of transmission line
2. Waveform distortion (distortion less line, wavelength and velocity of propagation and line not terminated in Z_0 and reflection coefficient)
3. Open and short circuited lines derivation
4. Reflection factor and reflection loss
5. Loading and types of loading
6. Problems



IMPORTANT QUESTIONS – UNIT 2

1. Standing wave ratio measurement of VSWR and wavelenth.
2. Open and short circuit lines on high impedance or high frequency transmission line
3. Line of zero dissipation / input impedance of dissipation less line.
4. Power and Impedance measurement on transmission lines.
5. Problems



IMPORTANT QUESTIONS – UNIT 3

1. Double stub matching.
2. Single stub matching.
3. Smith chart theory and problems.
4. Impedance matching and quarter wave transformer and its applications.
5. Problems



IMPORTANT QUESTIONS – UNIT 4

1. TE and TM waves between parallel plates.
2. TE and TM waves in circular waveguides.
3. TE and TM waves in rectangular wave guide.
4. Problems



IMPORTANT QUESTIONS – UNIT 5

1. Design of RF amplifiers -Power amplifier ,low noise amplifier and VCO (PLL)
2. Working Principle of RF Transistors – FET and BJT
3. HEMT (High Electron Mobility Transistor)





EC3551 Transmission Lines and RF Systems

Important Topics

3/6

UNIT 1

Expression for attenuation, phase constants of a transmission line, Expression for voltage and current at any point on a transmission line in terms of receiving end voltage and current,

padeepz Determination of Z_0

UNIT 2

Voltage and current on the dissipation less line,
Input impedance of the dissipation less line

UNIT 3

Smith Chart, Single stub and double stub matching technique

UNIT 4


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TM waves (Field Components, cut off frequency, velocity of propagation, Rectangular waveguide)

UNIT 5

RF Amplifier, RF field effect transistor.

padeepz



IMPORTANT LONG ANSWER TYPE – TOPICS

Unit – 1

11. Expression for attenuation, phase constants of a transmission line.

Expression for voltage and current at any point on a transmission line in terms of receiving end voltage and current.

Determination of Z_0 .

TIG

SILVER

Tamilnadu Engineering

Unit – 2

12. (i) Voltage and current on the dissipation less line
(ii) Input impedance of the dissipation less line

