# STUDY OF WIRELESS COMMUNICATIONS

# USING

# COMMUNICATION TRAINER KITS

# WIRELESS PATH LOSS COMPUTATIONS

# STUDY OF PROPAGATION PATH LOSS MODELS:

# INDOOR & OUTDOOR

# ANTENNA DESIGN CONCEPT

# USING

# 4NEC2

# BASEBAND COMMUNICATION

## Review Questions

1. **What is meant by ISI?**
2. **How ISI can be avoided?**
3. **What are the benefits of pulse shaping?**
4. **What is clock slip l?**
5. **Explain : Eye Pattern?**
6. **What is the need for interpolation?**
7. **What tracking algorithm is used , explain?**
8. **Why pairing is done at the receiver end?**
9. **What is meant by Roll-off factor?**
10. **Why pairing is done?**

# ADAPTIVE LINEAR EQUALIZER

## Review Questions

1. **Why equalization?**
2. **What are the different types of equalizers?**
3. **What is RC Pulse shaping?**
4. **What do you mean by roll-off factor?**
5. **Explain the LMs rule for adaptive linear equalizer.**
6. **What is meant by ISI?**

# CODE DIVISION MULTIPLE ACCESS – MULTIPATH

## Review Questions

1. What is Multipath?
2. What is the  Effect of Multipath on the performance of CDMA
3. What is RAKE Receiver?
4. What is the Maximum Ratio Combining Technique
5. What Equal Gain Combining Technique

## CODE DIVISION MULTIPLE ACCESS - MULTIUSER

## REVIEW QUESTIONS

1. Why we go for Spread Spectrum Technique?
2. List the advantages of Spread Spectrum Technique
3. Define : Direct Sequence Spread Spectrum (DSSS)
4. What is meant by Spreading code and list its type
5. Define : Orthogonal Spreading Code
6. Define : Non-Orthogonal Spreading Code
7. Define : Mixed Spreading Code
8. What is Near – Far effect?
9. What is the effect of delay in spreading the data
10. What do you mean by Spreading and De-spreading of Data

## GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM)

## REVIEW QUESTIONS

1. What is Gaussian Minimum Shift Keying (GMSK) modulation
2. What is the use of Viterbi algorithm
3. Why GMSK modulation is used for GSM
4. How GMSK signal is generated?
5. Draw the GSM transmitter and GSM Receiver
6. What is meant by Frame synchronization
7. Define : frequency synchronization
8. What is offset phase synchronization

## SPREAD SPECTRUM – DSSS MODULATION & DEMODULATION

## REVIEW QUESTIONS

1. **What do you mean by spread spectrum**
2. **What are the uses of spread spectrum**
3. **What is DSSS**
4. **What is FHSS**
5. **What is spreading code**

## FREE SPACE PROPAGATION – PATH LOSS MODEL

## REVIEW QUESTIONS

1. What is free space?
2. Write expression for received power.
3. What is meant by path loss?
4. What is the relation between received power and distance?
5. Why received power mostly calculated in dBm?
6. For all the wireless communication why is it necessary to calculate free space propagation.
7. How loss will be evaluated in free space propagation?

## SATELLITE COMMUNICATION – LINK BUDGET CALCULATION

## REVIEW QUESTIONS

1. What is the frequency used in uplink and downlink?
2. Why it is necessary to calculate link budget power equation?
3. What are the losses encountered in satellite communication?
4. Write the formula to calculate the freespace loss.
5. What are losses encountered during satellite communication.
6. What is antenna misalignment loss

## SATELLITE COMMUNICATION – LINK BUDGET CALCULATION

## REVIEW QUESTIONS

1. What is the frequency used in uplink and downlink?
2. Why it is necessary to calculate Carrier to noise ratio?
3. What are the losses encountered in satellite communication?
4. Write the formula to calculate the Carrier to noise for uplink and downlink.
5. What are the parameters taken into consideration while calculating C/N

## OUTDOOR PROPAGATION MODEL – HATA MODEL

## REVIEW QUESTIONS

1. What are different propagation mechanism
2. How will you calculate path loss in outdoor environment
3. Where will you use HATA model
4. What is the coverage distance and frequency?
5. What are the range of coverage distance , frequency, antenna heights to be considered in HATA model

## OUTDOOR PROPAGATION MODEL – Okumura model MODEL

## REVIEW QUESTIONS

1. What are different propagation mechanism
2. How will you calculate path loss in outdoor environment
3. Where will you use Okumura model
4. What is the coverage distance and frequency?
5. What are the range of coverage distance , frequency, antenna heights to be considered in Okumura model

# TE0421 – WIRELESS COMMUNICATION LAB

Laboratory Manual


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# TE0421- WIRELESS COMMUNICATION LAB

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**Date :**

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# TE0421 - Wireless Communication Lab

## List of Experiments

### Study of wireless Communications using Communication Trainer Kits

1.a Baseband Communication
1.b. Adaptive Linear Equalizer
1. c. Code Division Multiple Access (CDMA) - Multipath
1. d Code Division Multiple Access (CDMA) – Multiuser
1. e Global System for Mobile Communication (GSM)
(Using WiCOMM-T - Wireless Digital Communication Training system – SDR Platform )
1.f. Spread Spectrum – DSSS Modulation & Demodulation
(Using Emona 101 Tranier Kit)

### Wireless Path loss Computations - Study of Propagation Path loss Models : Indoor & Outdoor(Using Matlab Programming)

2.a Free Space Propagation – Path Loss Model
2.b Link Budget Equation for Satellite Communication
2.c Carrier to Noise Ratio in Satellite Communication
2.d Outdoor Propagation – Okumura Model
2.e Outdoor Propagation – Hata Model

### Antenna Design Concept (using 4NEC2)

3.a Dipole Antennas
3.b Yagi – Uda Antenna – 3 element
3.c Yagi – Uda Antenna – 5 element
3.d Yagi – Uda Antenna – 7 element