COURSE CONTENT

UNIT-I

Digital Communication: Sampling theorem (Instantaneous Sampling, Natural Sampling and Flat Top Sampling), PAM, PPM, PWM, Quantization noise, PCM, Binary Modulation: ASK PSK, FSK, MSK, DPSK, QPSK and their probability of error calculation.

UNIT-II

Data Communications: Review of Error Detection and Correction codes. Need of line coding Line coding scheme: Unipolar, Polar, Bipolar and Multilevel Encoding, Network and Protocol Architecture, Reference Model ISO-OSI, TCP/IP-Overview, topology, DTE-DCE interface interface standards, modems, cable modem, transmission media. Switching: Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching,

UNIT-III

Data Link Layer: Data Link Control and Protocols: Flow and Error Control, Stop-and-wait ARQ. Sliding window protocol, Go-Back-N ARQ, Selective Repeat ARQ, HDLC, Point-to – Point Access: PPP Point –to- Point Protocol, PPP Stack, IEEE standard 802.3 & 802.11 for LANS, high speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices- repeaters, hubs, switches bridges.

UNIT-IV

Medium Access Sub layer: Channel allocation problem, multiple access protocols (ALOHA, CSMA and CSMA/CD)

Network Layer: Design issues, Routing algorithms, Congestion control algorithms, Host to Host Delivery: Internetworking

UNIT-V

Queuing Theory: Finite Markov Chain –Discrete and continuous time Markov chains, Classification of states, Limiting distribution, Birth and death process, Poisson process, Steady state and transient distributions, Simple Markovian queuing models (M/M/1, M/M/1/N).

List of Experiments

1. **Introduction to MATLAB**
   a. **Matrix computation.**
   b. **To Plot Sine Wave of frequency 200 Hz.**
   c. **To plot a pulse of width 10.**
   d. **Plot the spectrum (Amplitude and phase) Of the pulse generated in 3.**
2. **Uniform random number and plot its density function. Find its mean and variance.**
3. **Generate Gaussian distributed random number and plot its density function. Find its mean and variance.**
4. **Compute the Signal to quantization Noise ratio of Uniform Quantization. Plot SNQR versus Quantization levels.**
5. **Compute the Signal to quantization Noise ratio of Non-Uniform Quantization. Plot SNQR versus Quantization levels.**
6. **Study of passband digital communication technique BPSK. Calculate the BER of BPSK modulated signal.**
7. **Given is a linear block code with the generator matrix G**

a. G = 1 1 0 0 1 0 1 / 0 1 1 1 1 0 0 1 1 1 0 0 1 1

   a. **Calculate the number of valid code words N and the code rate RC. Specify the complete Code set C.**
   b. **Determine the generator matrix G′ of the appropriate systematic (separable) code C'.**
   c. **Determine the syndrome table for single error.**
8. **To generate a M/M/1 Queue having infinite buffer space with parameters (λ, μ) and plot the average delay per packet vs λ/μ.**
9. **To generate a M/M/1 Queue having finite buffer space with parameters (λ, μ) and plot blocking probability with respect to variation with buffer space.**
10. **To simulate STOP and WAIT protocol using M/M/1 queuing system and plot average delay per packet vs λ/μ.**

10. To simulate STOP and WAIT protocol using M/M/1 queuing system and plot average delay per packet vs λ/μ.
11. To simulate SLIDING WINDOW protocol and evaluate its performance with variation of window size.
12. Observe and measure the performance of TOKEN BUS MAC Layer protocols by changing the network load, distance between the nodes.

13. Observe and measure the performance of ALOHA protocol by changing the network load, distance between the nodes.
14. Observe and measure the performance of CSMA protocols by changing the network load, distance between the nodes.
15. Observe and measure the performance of CSMA/CD protocols by changing the network load, distance between the nodes.