



K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCES
SESSION: 2023-2024 (ODD SEMESTER)

QUESTION BANK

Degree : **B.E**
Branch : **AI&DS**
Course Title : **Computer Networks**

Semester : **V**
Course Code : **21CS52**

MODULE 1

1. Differentiate between
 - i) Connection-Oriented and Connectionless service.
 - ii) OSI model and TCP/IP model
2. Explain LAN, PAN, WAN, MAN in computer networks.
3. Explain TCP/IP model with a neat diagram.
4. Explain OSI reference model with a neat a diagram.
5. List six service primitives to provide connection-oriented service and explain a simple client-server Interaction using acknowledges datagram.
6. Explain critiques of OSI reference model TCP/IP model
7. What is guided media? Explain
 - i. Twisted paired cable
 - ii. Coaxial cable
 - iii. Fiber optics
 - iv. Magnetic media
 - v. Power lines
8. What is wireless transmission. Explain
 - i. Radio Transmission
 - ii. Microwave Transmission
 - iii. Light transmission
 - iv. Infrared transmission.
9. Explain key design issues in computer networks.

MODULE 2

1. List and explain the design issues of data link layer.
2. What is framing? Explain
 - i. Byte count
 - ii. Flag bytes with byte stuffing
 - iii. Flag bits with bit stuffing
3. What is hamming distance? And find the hamming distance between the code words 10001001 and 10110001
4. Explain NASA binary convolution code with a neat block diagram. Consider the data as 111.
5. a) A bit word 01101 is to be transmitted. Construct the even parity hamming code for the data.
b) A bit word 1000001 is to be transmitted. Construct the even parity (11,7) hamming code for the data
6. Write a short note on Reed Solomon code and low density parity check code.
7. a) Generate the bit stream transmitted for the frame 1101011111 using generator polynomial $G(x)=x^4+x+1$ using CRC error detection method.
b) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is $G(x)=x^3+1$. Show the actual bit string transmitted. Suppose that the third bit from left is inverted during transmission show that error is detected at the receiver.
8. a) Calculate the checksum for the given input message and also find the message transmitted from the source. Consider the Input frame as 10110011 10101011 01011010 11010101.
b) Suppose that a message 1001 1100 1010 0011 is transmitted using internet checksum. What is the value of checksum.
9. Explain Interleaving of parity bits to detect the burst error with an example.
10. Explain Parity check error detection with an example
11. Explain with following data link protocols with algorithm
 - a. Utopian Simplex protocol.
 - b. Simplex stop and wait protocol for error free and noisy channel.
 - c. One bit sliding window protocol.
 - d. Protocol using Go-back to N
 - e. Protocol using selective repeat.
12. Explain Persistent and Non-Persistent CSMA protocol (Carrier sense protocols.)

13. Explain Pure aloha and slotted aloha(multiple access protocols)
14. Explain following collision free protocols.
 - a. Bit map protocol.
 - b. Token passing
 - c. Binary countdown
 - d. Wireless LAN

MODULE 3

1. Explain the network layer design issues.
2. Differentiate between datagram network and virtual network.
3. Define optimality principle. Explain it with an example.
4. Explain
 - a. Shortest path algorithm with an example (Dijkstra's algorithm) .
 - b. Flooding
 - c. Hierarchical routing with an example.
5. Briefly explain count to infinity problem.
6. Explain Distance vector routing with an example.
7. Explain Link state routing with an example.
8. Explain
 - a. Broadcast routing with an example.
 - b. Routing for mobile hosts.
 - c. Multicast routing
 - d. Anycast routing
 - e. Routing in ADHOC networks.
9. Briefly explain the approaches used in congestion control.
10. What is traffic throttling? Explain
 - i) Choke packets
 - ii) Explicit congestion notification.
 - iii) Hop by Hop back pressure.
11. What is QOS? What are the techniques taken to improve QOS.
12. What is traffic shaping? Explain Leaky bucket and token bucket algorithm.
13. Explain packet scheduling.

MODULE 4

1. Explain the services provided by transport layer.
2. Write short notes on User Datagram Protocol (UDP)
3. Describe about
 - a) TCP connection management
 - b) Avoidance of congestion in TCP.
4. Discuss the following with respect to Transmission Control Protocol
 - a. TCP connection management modeling.
 - b. TCP transmission policy.
 - c. TCP segment header.
5. Explain in detail about the Real Time Transport Protocol
6. Illustrate the Scenarios for establishing a connection using a Three-Way Handshake.
7. Explain in detail about Connection management
8. Discuss about the header format of UDP
9. What is the format of IPv4 header? Describe the significance of each field.
10. Explain TCP Connection management Finite State Machine. Explain all states in it.

MODULE 5

1. Explain Client-server architecture and P2P architecture.
2. Illustrate socket communication between two processes that communicate over the internet.
3. List transport services available to applications.
4. Explain TCP and UDP services available to application layer
5. Explain HTTP with an example.
6. Explain Non-persistent and persistent connections of HTTP protocol.
7. Explain SMTP protocol is used in Email applications
8. Describe general format of an HTTP request and response message.
9. Explain web caching.
10. Explain internet electronic mail system with a neat diagram.
11. Explain the services provided by DNS.
12. Explain how DNS work.
13. Explain DNS message format.
14. Write briefly about World wide web
15. Explain about Application layer and its services in detail?