UNIT1

1. **What is Internet? Explain the Nuts and bolts of Internet**
2. **Write a note on Guided and Unguided media. Explain**
    1. **Twisted- Pair Cable**
    2. **Coaxial Cable**
    3. **Fiber Optic Cable**
    4. **RAdio Wave**
    5. **Microwave**
    6. **Infrared Wave**
3. **Explain a simple packet-switched network with a neat diagram.**
4. **Explain circuit switching network with a diagram**
5. **Illustrate the different delays that a packet suffers in Packet-switched network.**
6. Define the term data communication. Explain data communication with respect to its fundamental characteristics and components **(x4)**
7. Explain the OSI reference model with a neat diagram **(x4)**
8. Explain the different layers of the TCP/IP model and correlate the layers of TCP/IP to the layers of the OSI model **(x3)**
9. Define the term protocol. Discuss the internet protocol stack with a neat diagram.
10. Explain
    11. LAN and WAN
    12. Mesh and BUS topology, Star topology **(x3)**
    13. Physical address and logical address **(x2)**
    14. Specific address and port address

UNIT2

1. **Contrast on FTP protocol with its command with diagram.**
2. **Explain the message format of DNS and how to insert record in it**
3. **Explain all services provided by transport layer to network applications**
4. **Explain non-persistence HTTP with response time calculations. Define RTT**
5. **What is web caching? Explain its advantages**
6. **Compare client server architecture with P2P architecture taking file distribution as example OR Explain working of Bit torrent.**
7. **Contrast the Persistent HTTP and non-persistent**
8. **Step wise demonstrate the working of SMTP or POP3**
9. What are cookies
10. Explain the DNS message header format
11. Explain **(x4)**
    1. Bandwidth
    2. Throughput
    3. Latency
    4. Bandwidth delay Product for lan
    5. Phase
    6. Wavelength

UNIT 3

1. **Explain TCP segment structure with neat diagram**
2. **Explain UDP Segment Structure.**
3. **Explain Go-Back-N (GBN) in detail.**
4. **Explain sender and receiver sequence number space in Selective Repeat (SR) protocol.**
5. **Explain three way handshake in TCP.**
6. Explain Connectionless and Connection-Oriented Multiplexing and Demultiplexing.
7. Explain Transport-layer multiplexing and demultiplexing with the neat diagram.
8. For the following three 16-bit words calculate the checksum.

   0110011001100000

   0101010101010101

   1000111100001100

UNIT 4

1. **Differentiate between virtual circuits networks and datagram networks with a neat diagram**
2. **Explain with the neat diagram the router architecture in detail.**
3. **Discuss the head-of-line blocking. And explain how output port queuing is carried out by the**
   router.
4. **Explain types of switching fabrics**
5. **Explain**
   1. **NAT**
   2. **ICMP**
6. IPv4 datagram format with diagram
7. IPv6 datagram format with diagram
8. Demonstrate the Classless Inter Domain Routing taking 200.23.16.0/23 as example
9. List and explain the different switching techniques used in the router.
10. Change the following IP addresses from binary notation to dotted-decimal notation and also identify the class to which they belong to.
    1. 01111111 11110000 01100111 11111001
    2. 10101111 11000111 11111000 00011101
    3. 11011111 10110000 00011111 01011101
    4. 11100000 11110111 11000111 01111101
11. For the address 211.17.180.0/24 (assume the MASK as 11111111 11111111 11111111 00000000)
12. Find the class, netted and hosted of the following IP address
    1. 111.56.45.78
    2. 191.255.25.10
    3. 207.3.54.12
    4. 178.120.40.90
13. Explain the Tunneling with an example.
14. Explain the following terms in detail:
    a. Forwarding.
    b. Routing.

UNIT 5

1. List and define the different services provided by the Link layer.
2. Differentiate IP address and MAC address for any system in an LAN
3. Compare the single bit parity and 2D bit parity checking used in error detection
4. Demonstrate the working of TDMA and FDMA
5. Constrast upon CDMA along with CSMA/CA and CSMA/CD
6. What are ATM networks? Explain the different layers of the ATM network
7. Explain the ATM cell header.
8. Discuss in detail the MPLS-enhanced forwarding with an example.
9. Explain the different channel partitioning protocols.
10. Explain the different taking-turns protocols.
11. Explain the different random access protocols.
12. Explain ARP address resolution protocol
13. Given the D=101110 with the given G= 1101,

    Show the generation of the code-word at the sender site (using binary division).

    Show the checking of the code-word at the receiver site in both ways i.e. without error and with error (Assume the error at the 4^{th} bit of the code-word).