**MODULE 1**

1.What is protocol layering?what are the reasons for using layered architecture in computer networks?
2.what is the role of SMTP in email message transfer?
3.explain protocol layering and its advantages.
4.describe the working of file transfer protocol with suitable figures.
5.with figures explain the basic topologies used in network networks.
6.calculate the propagation time and transmission time for a 5 Mbytes message if the bandwidth of the network is 1 Mbps. Assume that distance between the sender and receiver is 12000km and light travels at 2.4x10^8 m/s.
7.Differentiate HTTP persistent and non-persistent communication.
8.List out and explain the functionalities of different DNS records.

Essays

1.explain the working of FTP and its features.
2.explain the 2 predominant network architecture used in modern network applications with diagrams.
3.explain the techniques and mechanisms that guarantee the quality of service of the network to deliver predictable service to an application program.
4.explain the layered architecture of the TCP/IP reference program.
5.with figure explain the responsibilities of various osi protocol layers
6.write short notes on the following protocols used in computer networks
a)ARP b)ICMP c)POP3 d)SMTP
7.List and explain ISO/OSI layers and their functions.
8. Describe various service models in Quality of Service (QOS).

**MODULE 2**

1.demonstrate the significance of sequence numbers numbers in stop and wait ARQ.
2.explain the TCP segment header format.
3.compare TCP and UDP at the transport layer.
4.explain multiplexing and demultiplexing with diagrams.
5.compare frequency division multiplexing with time division multiplexing.
6.with figure explain how go-back-n ARQ works.
7.Demonstrate how stop-and-wait protocol is used for reliable data transfer.

Essays

1.outline in detail the two well known data transport protocols provided by the internet transport layer.
2.explain why TCP congestion control is referred as additive increase multiplicative decrease form of congestion control.
3.how the flow and error control service is provided by the transport layer using go-back-n and selective-repeat protocols. Depict the working using timing diagrams.
4.explain TCP segment structure with the frame format.
5.elucidate TCP header structure and major transport layer services
6.explain congestion control.what are the factors which causes it?explain each categories of congestion control in detail.
7. Write a short note on:
a. Stop-and-wait b. Go-back-N

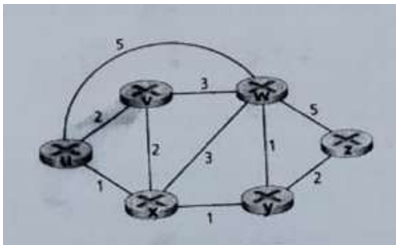
8.Explain the principles of congestion control with its fairness and efficiency

**MODULE 3**

1.compare datagram network with virtual network
2.explain multicast routing
3.differentiate between routing and forwarding.
4.differentiate between virtual circuit and datagram approach used in packet switching.
5.explain distance vector routing used in packet routing.
6.Explain how IPv6 solve the problem of IPv4 exhaustion?
7.Explain how ARP is working in data link layer?

Essays

1.describe the format of IPv6 datagram with the help of a diagram,highlighting the significance of each field.
2.explain the significance of routing in networking. Illustrate distant vector routing algorithm used in network routing.
3.how routing is performed in the internet using interdomain routing protocol BGP.
4.explain the working of link state routing. Use dijkstra's algorithm and show the tabular summary of the algorithm's computation to find the shortest path for node U in the below graph




5.a)express how address depletion faced by classful addressing is overcome by classless addressing.
b)a block of address is granted to a small organization.one of the address is 205.16.37.38/28. Find the starting and engine address given to organization.
6.with suitable diagram explain IPv4 datagram packet format.
7.Define routing? Explain the process of link state routing with OSPF protocol.
8.What is Virtual circuit? Explain the connection management in Virtual circuit with suitable diagrams.

**MODULE 4**

1.explain how parity is used to achieve error detection in data communication.
2.explain the working of CSMA/CD?
3.explain token passing and polling based multiple access protocol with examples.
4.what is the use of the checksum method? A sender has 2 data items to send. 1110011001100110 and 1101010101010101. Compute checksum for the data.
5.write short note on ethernet along with its frame format.
6.explain how token passing mechanism works in IEEE 802.5 standard.
7.A series of 8-bit message blocks to be transmitted across a data link using CRC for error detection. A generator polynomial of x^3+ x^2+1.is to be used. Message transmitted as 110010. Explain how CRC check is implemented?

8.Classify various wired media used in short and long distance communication.

Essays

1.a)what are channel partitioning protocols? Indicate the difference between each category of channel partitioning protocol.
b)draw the ethernet frame structure and mention the purpose of fields in it.
2.what are the different error detection techniques used at the data link layer?
3.explain CRC. generate codeword at sender and perform checking of codeword at receiver. Assuming no error for the dataword 1100 and divisor 1101 using CRC.
4.elucidate the techniques character oriented framing and bit oriented framing in data link control to organise the bits that are carried by the physical layer.
5.a)explain briefly on error detection code technique checksum used in data communication.
b)for this given data 11001100 10101010 11110000 11000011, perform checksum operation at sender site and receiver site and verify the data at receiver site.
6.explain carrier sense multiple access collision detection algorithm in detail.
7.Write a short note on:
a)Collision based multiple access protocol
b)Token based multiple access protocol
8.Explain IEEE 802.3 Ethernet frame format with its access protocol.

**MODULE 5**

1.explain network address translation.
2.what is VPN? List different types of VPN.
3.explain piconet and scatternet architecture of Bluetooth
4.what is the use of VPN are the techniques to guarantee privacy for organisations using VPN?
5.explain how simple network management protocol manages devices in a network with figure.
6.why gateways are used in computer networks? List its features.
7.Explain piconet topology of Bluetooth?
8.Explain Network Address Translation (NAT).

Essays

1.explain bluetooth with its architecture and layers.
2.explain network management and highlight the role of network administrator.
3.with neat diagram explain the architecture of IEEE 802.11 wireless LAN.
4.a)elaborate the working of traffic analysis tools
b)explain any 3 tools/commands for troubleshooting used by network administrators.
5.explain bluetooth technology with its architecture.
6.explain various functions and protocols used by network management system.
7.Write a short note on:
a)Traffic analysis tools
b)Troubleshooting