Unit 4: Network Layer

1. Explain the implementation of Connection-less Services at network layer with example (Datagram Approach).
2. Explain the implementation of Connection-oriented Services at network layer with example (Virtual Circuit Approach).
3. List and briefly explain the differences between Virtual Circuit and Datagram approach.
4. Draw header format for IPv4 Packet. Explain each field in brief.
5. Define Fragmentation. Explain various fields related to fragmentation in IPv4 packet header.
6. What are the differences between classful addressing and classless addressing in IPv4?
7. Explain why most of the addresses in class A are wasted. Explain why a medium-size or large-size corporation does not want a block of class C addresses.
8. Briefly define Subnetting and Supernetting. How does the subnet mask differ from a default mask in classless addressing?
9. Explain shortest path routing algorithm with a suitable illustration.
10. Explain the distance vector routing algorithm with example.
11. Mention and explain the limitations of distance vector routing algorithm.
12. Explain the link state routing algorithm with example.
13. Explain the requirement of Hierarchical Routing with example.
14. What is Broadcast Routing? Explain broadcast routing methods based on Spanning Tree and Reverse Path Forwarding.
15. Explain Multicast Routing with example.

Unit 5: Transport Layer

1. Explain Transport Layer Multiplexing and Demultiplexing with diagram.
2. Explain the various fields of UDP header with the help of a neat diagram.
3. Explain the various fields of TCP header with the help of a neat diagram.
4. Explain the various steps followed to establish and release transport level connection.
5. What is Congestion? Explain TCP Congestion Control Mechanism in detail.

Unit 6: Application Layer

1. Explain FTP with diagram.
2. Explain the message transfer using SMTP Protocol.
3. Explain the delivery of email to the end user using POP3 and IMAP Protocols.
4. What is HTTP? Draw and explain header format for HTTP Request and Response Messages in brief.
5. Compare HTTP and FTP.
6. Explain the working of Domain Name System.
7. Explain Recursive and Iterative Query Resolution in DNS.