

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Advanced Supplementary Examinations March 2025
DATA COMMUNICATIONS

(Open Elective)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) Compare and contrast the OSI model and the TCP/IP protocol suite? [7M]
b) Explain the architecture of IEEE 802.11 (WiFi) networks. [7M]
(OR)
2. a) Describe the layered architecture of the OSI model. Explain the function of each layer in detail? [7M]
b) What are the different physical structures of networks? Compare the advantages and disadvantages of various network topologies? [7M]

UNIT-II

3. a) Explain the role of the Link Layer in the OSI model. What services does it provide to ensure reliable data communication? [7M]
b) Illustrate working of parity checks and checksum methods for error detection? [7M]
(OR)
4. a) How do stop-and-wait and sliding window protocols ensure efficient flow control? [7M]
b) Explain the ALOHA protocol and its variations. What are the advantages and disadvantages of Pure ALOHA and Slotted ALOHA? [7M]

UNIT-III

5. a) Explain the structure and significance of IPv4 addressing. What are the key differences between IPv4 and IPv6? [7M]
b) How does Network Layer facilitate communication between devices across different networks? [7M]
(OR)
6. a) Compare the different network service models used in the Network Layer. How do they impact data delivery and performance? [7M]
b) Describe the various stages involved in packet forwarding within a router? [7M]

UNIT-IV

7. a) What is multiplexing and de multiplexing in the Transport Layer? Explain their importance in network communication. [7M]
b) Infer the key fields of a UDP segment? How do they contribute to data transmission? [7M]
(OR)
8. a) Compare and contrast Go-Back-N (GBN) and Selective Repeat (SR) protocols? [7M]
b) What is TCP congestion control? Discuss different approaches to managing network congestion. [7M]

UNIT-V

9. a) Differentiate client-server and peer-to-peer architectures with examples? [7M]
b) Describe the working of the File Transfer Protocol (FTP). How does it ensure reliable file transfer? [7M]
(OR)
10. a) How do SMTP and HTTP protocols handle data transmission differently? [7M]
b) Interpret steps are involved in resolving a domain name to an IP address in DNS? [7M]
