

Paper ID: 44602**L****T/P****C****Code: IT602****Paper: Data Communication and Networking****3****1****4****INSTRUCTIONS TO PAPER SETTERS:****Maximum Marks: 75**

- Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
- Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

Course Outcomes:

CO 1	Ability to apply the basic concepts of networking and to analyse different parameters such as bandwidth, delay, throughput of the networks for the given problem
CO 2	Ability to apply different techniques to ensure the reliable and secured communication in wired and wireless communication
CO 3	Ability to analyse the networking concepts of TCP/IP for wired and wireless components. Identify the issues of Transport layer to analyse the congestion control mechanism
CO 4	Design network topology with different protocols and analyse the performance using networking tools

Course Outcomes -Program Outcomes Matrix

Filled on a scale of 1 to 3 (3=High; 2=Moderate; 1=Low; '-' for no correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2	1	1	2	1	-	-	-	1
CO2	3	2	3	2	-	1	2	1	-	-	-	1
CO3	2	2	2	2	-	1	2	1	-	-	-	1
CO4	3	2	2	2	1	1	2	1	-	-	-	1

UNIT 1

Computer Networks: Introduction, Data Communications, Network and types, OSI model. TCP/IP model, LAN, WAN, MAN. Physical Link Layer: Data and Signals, Analog and digital signals, Transmission Impairment, Performance. Transmission: Digital Conversions, Analog Conversions, multiplexing, Transmission media: guided media and unguided media. switching: circuit-switched networks, packet switching

UNIT 2

Data Link Layer: Design issues, addressing. Error Detection and Correction: Types of Errors, Block Coding, Cyclic Codes, Checksum, Forward Error Correction, Data-Link Layer Protocols: Simple Protocol, Stop-and-Wait Protocol and Piggybacking, HDLC, PPP. Medium Access Control: Random Access, Controlled Access, Channelization. Wired LANs: Standard Ethernet, Fast Ethernet. Wireless LAN: Architecture, IEEE 802.11.

UNIT 3

Network Layer: Network-Layer Services, Packet Switching, Network-Layer Performance, IPV4 Addresses, Network-Layer Protocols: IP, ICMPV4, Routing Protocols: Unicast Routing Protocols: RIP, OSPF, BGP4. Congestion Control. ARP, RARP. Transport Layer: Services, Addressing, Connection establishment and release, error control and flow control, ATM Layers, Transport-Layer protocols, UDP and TCP.

UNIT 4

Application Layer: DHCP, DNS, Telnet, FTP, HTTP and SNMP. Network Security: Security goals and attacks, Ciphers. Internet Security: IPSec, Virtual Private Network (VPN). Transport Layer Security: SSL Architecture and Protocols. Firewalls: Packet-Filter Firewall, Proxy Firewall

Text Books:

- Behrouz A. Forouzan, "Data Communications and Networking", 5th Edition, Tata McGraw Hill, 2013
- Andrew S. Tanenbaum and David J. Wetherall, "Computer Networks", 5th Edition, Pearson Education India 2013.
- William Stallings, "Data and Computer Communications", 10th Edition, Pearson Education, India, 2017
- Larry L. Peterson and Bruce S. Davie, "Computer Networks: A Systems Approach", 5th Edition, Elsevier, 2012

References Books:

- Wayne Tomasi, "Introduction to Data Communication and Networking", Pearson Education, 2005

2. James F. Kurose and Keith W., "Computer Networking: A Top-Down Approach", 7th Edition, Pearson Education, 2017.
3. Natalia Olifer and Victor Olifer, "Computer Networks: Principles, Technologies and Protocols for Network Design", Wiley, 2006
4. Jerry FitzGerald, Alan Dennis and Alexandra Durcikova, "Business Data Communications and Networking", John Wiley & Sons, 2019