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Computer Communication Networks

(Code : ELC603)

Semester VI – Electronics Engineering
(Mumbai University)

Strictly as per New Choice Based Credit and Grading System Syllabus
(Revise 2019 'C' Scheme) of Mumbai University with effective from Academic Year 2021-2022

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ME199A Price ₹ 375/-



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First Printed in India : January 2001

First Edition : January 2022 (**TechKnowledge Publications**)

This edition is for sale in India, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, Sri Lanka and designated countries in South-East Asia. Sale and purchase of this book outside of these countries is unauthorized by the publisher.

ISBN : 978-93-5563-037-7

Published by :

TechKnowledge Publications

Head Office : B/5, First floor, Maniratna Complex, Taware Colony, Aranyeshwar Corner,

Pune - 411 009. Maharashtra State, India

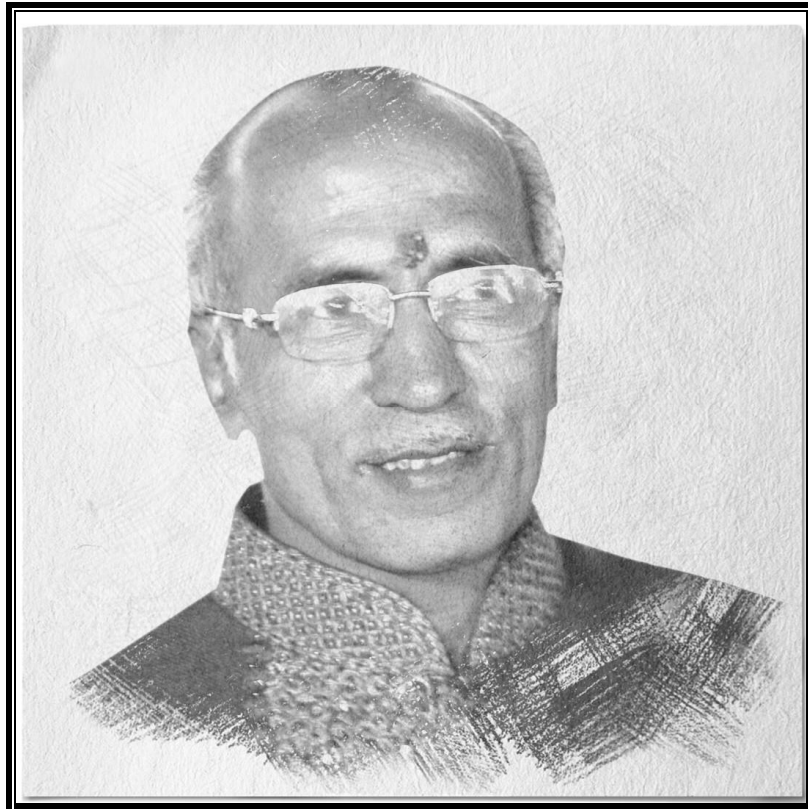
Ph : 91-20-24221234, 91-20-24225678.

Email : info@techknowledgebooks.com,

Website : www.techknowledgebooks.com

[ELC603] (FID : ME199) (Book Code : ME199A)

*We dedicate this Publication soulfully and wholeheartedly,
in loving memory of our beloved founder director,
Late Shri. Pradeepji Lalchandji Lunawat,
who will always be an inspiration, a positive force and strong support
behind us.*



“My work is my prayer to God”

- Lt. Shri. Pradeepji L. Lunawat

*Soulful Tribute and Gratitude for all Your
Sacrifices, Hardwork, and 40 years of Strong Vision...*

Syllabus...

Computer Communication Networks : Sem. VI (Electronics Engineering, (MU))

Course Code	Course Name	Teaching Scheme (Hrs.)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tut.	Total
ELC603	Computer Comm. Networks	03	-	-	03	-	-	03

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal Assessment			End Sem. Exam.				
		Test 1	Test 2	Ave. of Test 1 and Test 2					
ELC603	Computer Comm. Networks	20	20	20	80	03	—	—	100

Course pre-requisite :

ELC 404 : Principles of Communication Engineering

ELC 504 : Digital Communication

Course Objectives :

- The objectives of this course are to :
 1. Introduce networking architecture and protocols.
 2. Understand the various layers and protocols in the TCP/IP model.
 3. Recognize different addressing schemes, connecting devices and routing protocols.
 4. Select the required protocol from the application layer protocols.

Course Objectives :

- On successful completion of the course the students will be able to :
 1. Demonstrate understanding of networking concepts and required protocols.
 2. Analyze the various layers and protocols of the layered architecture.
 3. Evaluate different addressing schemes, connecting devices and routing protocols.
 4. Analyze various routing protocols in Network layer.
 5. Understand the various protocols in Transport layer.
 6. Comprehend the different protocols in application layer.

Module 1

Introduction to Network Architectures, Protocol Layers, and Service models :

Introduction to computer networks and its uses. LAN, MAN, WAN, Network topologies, **Addressing** : Physical / Logical / Port addressing, Protocols and Standards. **Protocol Architecture** : Need of layered protocol architecture, Layers details of OSI, Protocol layers and Their service models. **TCP / IP Model** : Protocol suite, Comparison of OSI and TCP / IP. **(Refer Chapter 1)**

Module 2

Physical Layer :

Transmission Media : Guided media like coaxial, Fiber, Twisted pair and Wireless media, Transmission impairments. **Interconnecting Devices** : Hub, Bridges, Switches, Router, Gateway. **Introduction to LAN** : LAN protocol architecture. **Traditional Ethernet and IEEE 802.3 LAN Standard** : Ethernet protocol, Frame structure, **Physical layers** : LLC, MAC layers. **Multiplexing** : Synchronous TDM, Statistical TDM, ADSL. **(Refer Chapters 2 and 3)**

Module 3

Data Link Control :

Data link services : Framing, Flow control, Error control, ARQ methods, Piggybacking, **High Level Data Link Control (HDLC)** : HDLC configurations, Frame formats, Typical frame exchanges. **Medium Access Control Protocols** : ALOHA, Slotted ALOHA, CSMA, CSMA/CD. **(Refer Chapters 4 and 5)**

Module 4

Network Layer :

Switching : Switched communication networks, Circuit switching networks, **Circuit Switching Concepts** : Crossbar switch, Time Slot Interchange (TSI), TDM bus switching, **Packet switching principles** : Virtual circuit switching and Datagram switching, **Routing in Packet Switching Networks** : Characteristics, Routing strategies, Link state routing, Distance vector routing. **Least-Cost Routing Algorithms** : Dijkstra's algorithm, Bellman Ford algorithm.

Internet protocol :

Principles of Internetworking : Requirements, Connectionless operation, **Internet Protocol Operation** : IP packet, **IP addressing** : Classful and Classless, Subnet and Supernet addressing, IPv4, IPv6 (IPv6 Datagram format, Comparison with IPv4 and Transition from IPv4 to IPv6). **(Refer Chapters 6 and 7)**

Module 5

Transport Layer :

Connection-oriented Transport Protocol Mechanisms : **Transmission Control Protocol (TCP)** : TCP services, TCP header format, TCP three way handshake, TCP state transition diagram. **Connectionless transport mechanisms** : User Datagram Protocol (UDP) – header. **Congestion** : Effects of congestion, Congestion control methods, Congestion control in packet switching networks. **(Refer Chapter 8)**

Module 6

Application Layer :

HTTP, FTP, DNS, SMTP, Internet Telephony and Streaming Multimedia.

(Refer Chapter 9)

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**Module 1****Chapter 1 : Introduction 1-1 to 1-48**

Syllabus : Introduction to computer networks and its uses. LAN, MAN, WAN, Network topologies, **Addressing** : Physical / Logical / Port addressing, Protocols and Standards. **Protocol Architecture** : Need of layered protocol architecture, Layers details of OSI, Protocol layers and Their service models. **TCP / IP Model** : Protocol suite, Comparison of OSI and TCP / IP.

<ul style="list-style-type: none"> 1.1 Introduction..... 1-2 <ul style="list-style-type: none"> 1.1.1 Computer Networks 1-2 1.1.2 Hardware and Software 1-2 1.1.3 Protocol 1-2 1.1.4 Components of a Computer Network 1-3 1.1.5 Applications of Computer Networks 1-3 1.2 Benefits of Computer Networks 1-3 <ul style="list-style-type: none"> 1.2.1 Disadvantages of Networks 1-3 1.3 Network Services / Applications 1-3 <ul style="list-style-type: none"> 1.3.1 Service Provided to Organizations 1-3 1.3.2 Services Provided to People 1-4 1.4 Network Topology 1-4 <ul style="list-style-type: none"> 1.4.1 Bus Topology 1-5 1.4.2 Ring Topology 1-6 1.4.3 Star Topology 1-8 1.4.4 Mesh Topology 1-9 1.4.5 Tree Topology 1-10 1.4.6 Logical Topology 1-10 1.4.7 Hybrid Topology 1-10 1.4.8 Comparison of Star, Bus and Ring Topologies 1-11 1.4.9 Comparison of Tree and Mesh Topologies 1-11 1.5 Types of Communication 1-11 1.6 Network Hardware 1-12 <ul style="list-style-type: none"> 1.6.1 Transmission Technology 1-12 1.6.2 Network Scale 1-12 	<ul style="list-style-type: none"> 1.7 Network Classification by their Geography 1-13 <ul style="list-style-type: none"> 1.7.1 Local Area Networks (LAN) 1-13 1.7.2 Metropolitan Area Network (MAN) 1-14 1.7.3 Wide Area Network (WAN) 1-14 1.7.4 Wireless Networks 1-15 1.7.5 Internetworks 1-15 1.7.6 Comparison of LAN, WAN and MAN ... 1-15 1.8 Network Classification Based on Architecture 1-16 1.9 Peer-to-Peer Networks 1-16 <ul style="list-style-type: none"> 1.9.1 When to use Peer to Peer Networks ?.. 1-17 1.10 Client / Server Network 1-17 <ul style="list-style-type: none"> 1.10.1 Communication in Client-Server Configuration 1-17 1.10.2 Comparison between Peer-to-Peer Network and Client-Server Network 1-18 1.11 Protocols and Standards 1-18 <ul style="list-style-type: none"> 1.11.1 Protocols 1-18 1.11.2 Important Elements of a Protocol 1-19 1.11.3 Standards 1-19 1.11.4 Standard Organizations 1-19 1.12 Layered Tasks 1-20 1.13 Network Software 1-21 <ul style="list-style-type: none"> 1.13.1 Protocol Hierarchies (Layered Architecture)..... 1-21 1.13.2 Reasons for having Layered Protocols and its Benefits 1-21 1.13.3 Disadvantages of Layered Architecture 1-22 1.13.4 How does Data Transfer take Place ? .. 1-22 1.14 Network Architecture 1-22 <ul style="list-style-type: none"> 1.14.1 Virtual Communication between Layers 1-22 1.15 Design Issues for the Layers 1-23 1.16 Connection Oriented and Connectionless Services 1-24 <ul style="list-style-type: none"> 1.16.1 Examples of C.O. and C.L. Services ... 1-25 1.16.2 Comparison of C.O and C.L. Services 1-25
---	--



1.17	Interface and Services	1-26	1.23.3	Hybrid (Internet) Reference Model	1-42
1.17.1	Service	1-27	1.23.4	Comparison of Models	1-43
1.17.2	Protocol	1-27	1.24	Addressing	1-43
1.18	Reference Models	1-27	1.24.1	MAC Address (Physical Address)	1-44
1.19	OSI Model	1-27	1.24.2	Logical Addresses (IP Addresses)	1-45
1.19.1	Layered Architecture	1-27	1.24.3	Port Address	1-45
1.19.2	Communication in OSI Model	1-28	1.24.4	Specific Addresses	1-45
1.19.3	Peer to Peer Processes	1-29	1.25	Socket and Socket Address	1-46
1.19.4	Organization of the Layers	1-29	1.25.1	Ports and Sockets	1-46
1.19.5	Layer Details of OSI Model	1-30	1.26	University Questions and Answers.....	1-48
1.19.6	Exchange of Information in OSI Model	1-32	• Review Questions	1-47	
1.19.7	Merits of OSI Reference Model	1-33	Module 2		
1.19.8	Demerits of OSI Model	1-33	<hr/>		
1.20	The TCP / IP Reference Model	1-33	Chapter 2 : Physical Layer 2-1 to 2-24		
1.20.1	Introduction to TCP / IP	1-34	Syllabus : Transmission Media : Guided media like coaxial, Fiber, Twisted pair and Wireless media, Transmission impairments. Interconnecting Devices : Hub, Bridges, Switches, Router, Gateway.		
1.20.2	Layer Details of TCP/IP	1-34	2.1	Introduction to Physical Layer	2-2
1.20.3	Description of TCP/IP Model	1-34	2.1.1	Physical Layer Design Issues	2-2
1.20.4	Layered Architecture	1-35	2.1.2	Transmission Media and Physical Layer	2-2
1.20.5	Logical Connections in the TCP / IP	1-36	2.2	Transmission Media	2-3
1.20.6	Data unit created by every layer	1-36	2.2.1	Classification of Transmission Media	2-3
1.21	Detailed Description of Each Layer	1-37	2.2.2	Selection of Transmission Media	2-3
1.21.1	TCP / IP Physical Layer	1-37	2.3	Types of Wired Media	2-3
1.21.2	TCP / IP Data Link Layer	1-37	2.4	Twisted Pair Cables	2-4
1.21.3	TCP / IP Network Layer	1-38	2.4.1	UTP (Unshielded Twisted Pair)	2-4
1.21.4	TCP / IP Transport Layer	1-39	2.4.2	STP (Shielded Twisted Pair)	2-4
1.21.5	TCP / IP Application Layer	1-40	2.4.3	Categories of UTP	2-5
1.22	Encapsulation and Decapsulation	1-40	2.4.4	Comparison of Twisted Pair Cables	2-6
1.22.1	Encapsulation at the Source Host	1-40	2.5	Co-axial Cables	2-6
1.22.2	Decapsulation and Encapsulation at the Router	1-41	2.6	Optical Fiber Cables	2-8
1.22.3	Decapsulation at the Destination Host	1-41	2.6.1	Characteristics of Optical Fiber Cables	2-8
1.23	Addressing in TCP / IP	1-42	2.6.2	Advantages of Optical Fibers	2-9
1.23.1	Merits of TCP / IP model	1-42	2.6.3	Disadvantages of Optical Fiber	2-9
1.23.2	Demerits of TCP / IP Model	1-42	2.6.4	Applications	2-9



2.6.5	Comparison of Wired Media	2-9
2.7	Wireless Media	2-10
2.8	EM Spectrum for Wireless Media	2-10
2.8.1	Communication Bands	2-10
2.8.2	The ISM Band	2-11
2.8.3	Infrared Signals	2-11
2.8.4	Visible Light	2-11
2.9	Types of Wireless Media	2-11
2.9.1	Radio Wave Transmission Systems	2-11
2.9.2	Microwave Transmission System	2-12
2.9.3	Use of Infrared Light as Medium	2-13
2.9.4	Advantages of Wireless Transmission	2-14
2.9.5	Disadvantages of Wireless Transmission	2-14
2.9.6	Comparison of Wired and Wireless Media	2-14
2.10	Transmission Impairments	2-14
2.10.1	Attenuation	2-14
2.10.2	Delay Distortion	2-15
2.10.3	Harmonic Distortion	2-15
2.10.4	Noise	2-16
2.10.5	Signal to Noise Ratio	2-17
2.11	Networking Devices	2-17
2.12	Hubs	2-18
2.12.1	Passive Hubs	2-19
2.12.2	Active Hubs	2-19
2.12.3	Intelligent Hubs	2-19
2.13	Repeaters	2-19
2.14	Bridges	2-20
2.15	Routers	2-21
2.16	Gateways	2-22
2.17	Switches	2-22
2.17.1	Comparison of Networking Devices	2-23
	• Review Questions	2-24

Module 2**Chapter 3 : Local Area Networks****3-1 to 3-30**

Syllabus : Introduction to LAN : LAN protocol architecture. Traditional Ethernet and IEEE 802.3 LAN Standard : Ethernet protocol, Frame structure, Physical layers : LLC, MAC layers. Multiplexing : Synchronous TDM, Statistical TDM, ADSL.

3.1	Introduction to LAN.....	3-2
3.1.1	LAN Attributes	3-2
3.1.2	LAN Topologies	3-2
3.1.3	Transmission Media	3-2
3.1.4	Standards for LANs	3-2
3.1.5	General Concepts	3-2
3.1.6	Technological Ingredients	3-2
3.2	LAN Applications	3-2
3.2.1	Personal Computer LANs	3-2
3.2.2	Backend Networks and Storage Area Networks (SAN)	3-3
3.2.3	High Speed Office Networks	3-3
3.2.4	Backbone LANs	3-3
3.2.5	Types of Networks	3-4
3.3	LAN Architecture	3-4
3.3.1	Protocol Architecture	3-4
3.4	Ethernet	3-6
3.4.1	Traditional Ethernet	3-6
3.4.2	Bridged Ethernet	3-7
3.4.3	Switched Ethernet	3-7
3.4.4	Full Duplex Ethernet	3-7
3.4.5	Fast Ethernet	3-7
3.4.6	Gigabit Ethernet	3-7
3.5	IEEE Standards	3-7
3.6	Traditional Ethernet (IEEE 802.3)	3-8
3.6.1	Traditional Ethernet Frame	3-8
3.6.2	Frame Length	3-9
3.6.3	Addressing	3-9



3.6.4	Types of Addresses	3-9	3.16	ADSL	3-24
3.6.5	Physical Properties of Ethernet	3-10	3.16.1	Use of Existing Local Loop	3-25
3.6.6	Physical Layer Implementation of Standard Ethernet	3-10	3.16.2	Adaptive Technology	3-25
3.7	Fast Ethernet	3-11	3.16.3	Modulation Techniques	3-25
3.7.1	Autonegotiation	3-12	3.16.4	Discrete Multitone Technique (DMT)	3-25
3.7.2	Physical Layer Implementation	3-12	3.16.5	ADSL Modem	3-26
3.8	Gigabit Ethernet	3-12	3.16.6	DSLAM	3-26
3.8.1	MAC Sublayer	3-13	3.17	xDSL (Other DSL Technologies)	3-26
3.8.2	Physical Layer	3-14	3.17.1	RADSL	3-26
3.8.3	Physical Layer Implementation	3-14	3.17.2	HDSL	3-27
3.8.4	Ten Gigabit Ethernet	3-15	3.17.3	SDSL	3-27
3.8.5	Comparison of Standard and Gigabit Ethernet	3-15	3.17.4	VDSL	3-28
3.9	LAN Bridges	3-15	3.17.5	Comparison of xDSL Schemes	3-28
3.9.1	802 Bridges	3-16	3.18	University Questions and Answers.....	3-29
3.9.2	Transparent Bridges	3-16	• Review Questions	3-28	
3.9.3	Source Routing Bridges	3-18	Module 3		
3.9.4	Remote Bridges	3-19	Chapter 4 : Data Link Control 4-1 to 4-22		
3.9.5	Looping Problem in Bridge LAN	3-19	Syllabus : Data link services : Framing, Flow control, Error control, ARQ methods, Piggybacking, High Level Data Link Control (HDLC) : HDLC configurations, Frame formats, Typical frame exchanges.		
3.10	Mixed Media Bridges	3-20	4.1	Introduction	4-2
3.11	Introduction to Multiplexing	3-20	4.1.1	Position of Data Link Layer	4-2
3.11.1	Types of Multiplexing	3-21	4.2	Data Link Layer Design Issues	4-2
3.12	Synchronous Time Division Multiplexing	3-21	4.3	Services Provided to Network Layer	4-3
3.12.1	Advantages of TDM	3-22	4.3.1	Types of Services Provided	4-3
3.12.2	Disadvantages of TDM	3-22	4.3.2	Unacknowledged Connectionless Service	4-3
3.12.3	Applications of TDM	3-22	4.3.3	Acknowledged Connectionless Service	4-3
3.13	Statistical (Asynchronous) TDM	3-22	4.3.4	Acknowledged Connection Oriented Service	4-4
3.13.1	Data Rate of Statistical TDM	3-23	4.4	Framing	4-4
3.13.2	Slot Size	3-23	4.4.1	Framing Methods	4-4
3.13.3	Bandwidth	3-23	4.4.2	Character Count	4-4
3.13.4	Comparison of Synchronous TDM and Statistical TDM	3-23	4.4.3	Starting and Ending Character with Character Stuffing	4-4
3.14	Introduction to High Speed Digital Access	3-24			
3.15	DSL Technology	3-24			



4.4.4	Character Stuffing	4-5	4.10.5	Protocol Performance	4-30
4.4.5	Starting and Ending Flags, with Bit Stuffing.....	4-5	4.10.6	Comparison of Sliding Window Protocols	4-30
4.4.6	Physical Layer Coding Violations	4-6	4.11	High Level Data Link Control (HDLC) Protocol	4-33
4.5	Error Control	4-6	4.11.1	Operating Modes for Data Transfer	4-34
4.5.1	Function of a Timer	4-6	4.11.2	Frame Structure in HDLC	4-34
4.6	Error Detection and Correction	4-6	4.11.3	Frame Types in HDLC	4-35
4.6.1	Encoding and Decoding	4-7	4.11.4	Transparency in HDLC	4-37
4.6.2	Redundancy	4-7	4.11.5	Bit Stuffing	4-37
4.6.3	Classification of Error Control Techniques	4-7	4.11.6	HDLC Frame Exchanges	4-40
4.6.4	Error Detection Methods	4-7	• Review Questions	4-42	
4.6.5	Parity Checking	4-8	Module 3		
4.6.6	Checksum Error Detection	4-9	Chapter 5 : Medium Access Control Protocols		
4.6.7	Two Dimensional Parity Check (Block Parity)	4-9	5-1 to 5-18		
4.6.8	Cyclic Redundancy Check (CRC)	4-10	Syllabus : Medium Access Control Protocols : ALOHA, Slotted ALOHA, CSMA, CSMA/CD.		
4.6.9	CRC Checker	4-11	5.1	Introduction	5-2
4.7	Error Correction	4-14	5.1.1	MAC and LLC Sublayers	5-2
4.7.1	Classification of Error-correcting Codes	4-15	5.2	The Channel Allocation Problem	5-2
4.7.2	Linear Block Codes	4-15	5.2.1	Static Channel Allocation	5-3
4.7.3	Hamming Codes	4-15	5.2.2	Dynamic Channel Allocation	5-3
4.7.4	ARQ Technique	4-18	5.3	Multiple Access	5-4
4.8	Flow Control	4-19	5.3.1	Random Access	5-4
4.9	Elementary Data Link Protocols	4-20	5.3.2	Evolution of Random Access Methods	5-4
4.9.1	An Unrestricted Simplex Protocol	4-20	5.3.3	Taxonomy (Classification) of Multiple Access Protocols	5-4
4.9.2	A Simplex Stop and Wait Protocol	4-20	5.4	Multiple Access ALOHA System	5-5
4.9.3	A Simplex Protocol for Noisy Channel ..	4-20	5.4.1	Pure ALOHA	5-5
4.9.4	Piggybacking	4-21	5.4.2	Efficiency of an ALOHA System	5-6
4.10	Sliding Window Protocols	4-22	5.4.3	Slotted ALOHA	5-7
4.10.1	A One Bit Sliding Window Protocol (Stop and Wait ARQ)	4-24	5.4.4	Comparison of Pure and Slotted ALOHA	5-8
4.10.2	A Protocol using GO Back n	4-27	5.5	Carrier Sense Multiple Access (CSMA)	5-9
4.10.3	Pipelining	4-28	5.5.1	Carrier Sense Multiple Access / Collision Detection (CSMA / CD)	5-9
4.10.4	Selective Repeat ARQ	4-29			



5.5.2	CSMA / CD Procedure	5-10	6.5.3	Delay	6-11
5.5.3	CSMA / CA	5-11	6.5.4	Advantages of Packet Switching	6-11
5.6	Collision Free Protocols	5-13	6.5.5	Disadvantages of Packet Switching	6-11
5.7	Controlled Access	5-13	6.5.6	Datagram Networks in Internet	6-11
5.7.1	Reservation Systems	5-13	6.6	Virtual Circuit Packet Switching	6-12
5.7.2	Polling	5-14	6.6.1	Three Phases of Communication	6-12
5.7.3	Token Passing	5-15	6.6.2	Efficiency	6-13
5.8	University Questions and Answers	5-16	6.6.3	Delay	6-13
	• Review Questions	5-16	6.6.4	Advantages of Virtual Circuit Packet Switching	6-13
Module 4					
<hr/>					
Chapter 6 : Network Layer			6-1 to 6-50		
<hr/>					
Syllabus : Switched communication networks, Circuit switching networks, Circuit Switching Concepts : Crossbar switch, Time Slot Interchange (TSI), TDM bus switching, Packet switching principles : Virtual circuit switching and Datagram switching, Routing in Packet Switching Networks : Characteristics, Routing strategies, Link state routing, Distance vector routing. Least-Cost Routing Algorithms : Dijkstra's algorithm, Bellman Ford algorithm.					
6.1	Switching	6-2	6.7	Comparison of Message, Circuit and Packet Switching	6-13
6.1.1	Switching Methods	6-2	6.8	Packet Switches	6-14
6.1.2	Circuit Switching	6-2	6.8.1	Input Port	6-14
6.1.3	Circuit Switched Technology in Telephone Networks	6-4	6.8.2	Output Port	6-14
6.2	Structure of Switch	6-4	6.8.3	Routing Processor	6-14
6.3	Circuit Switching Concepts	6-4	6.8.4	Switching Fabrics	6-14
6.4	Types of Circuit Switches	6-5	6.9	Network Layer	6-15
6.4.1	Space-Division Switches	6-5	6.9.1	Network Layer Duties	6-15
6.4.2	Time Division Switches	6-6	6.10	Network Layer Design Issues	6-16
6.4.3	Time - Space - Time Switches	6-7	6.10.1	Store and Forward Packet Switching	6-16
6.4.4	A 4 × 4 Time-Space-Time Switch	6-8	6.10.2	Services Provided to the Transport Layer	6-17
6.4.5	Comparison of Space Division and Time Division Switch	6-9	6.10.3	Implementation of Connectionless Service	6-17
6.5	Packet Switching	6-10	6.10.4	Implementation of Connection-Oriented Service	6-18
6.5.1	Datagram Packet Switching	6-10	6.10.5	Internal Organization of the Network Layer	6-18
6.5.2	Efficiency	6-11	6.10.6	Comparison of Virtual Circuit and Datagram Subnets	6-19
			6.11	Routing in Packet Switching Network	6-19
			6.11.1	Characteristics	6-19
			6.11.2	Performance Criteria	6-19
			6.12	Routing	6-20



6.12.1	Types of Routing	6-20	6.21.3	Routing Tables	6-42
6.12.2	Intra and Interdomain Routing	6-20	6.22	Network Layer Congestion	6-42
6.12.3	Unicast Routing	6-21	6.23	Congestion Control	6-43
6.12.4	Broadcast Routing	6-21	6.23.1	Need of Congestion Control	6-43
6.12.5	Multicast Routing	6-22	6.23.2	Causes of Congestion	6-43
6.13	Routing Algorithms	6-22	6.23.3	Difference between Congestion Control and Flow Control	6-44
6.13.1	Desired Properties of a Routing Algorithm	6-23	6.23.4	Principle of Congestion Control	6-44
6.13.2	Types of Routing Algorithms	6-23	6.24	Congestion Prevention Policies	6-45
6.13.3	Optimality Principle	6-23	6.24.1	Congestion Control in Virtual Circuit Subnets	6-47
6.14	Static Algorithms	6-23	6.24.2	Approaches to Congestion Control	6-47
6.14.1	Shortest Path Routing	6-23	6.24.3	Congestion Control in Datagram Subnets	6-48
6.14.2	Flooding	6-24		• Review Questions	6-50
6.15	Dynamic Routing Algorithms	6-24	Module 4		
6.16	Distance Vector Routing Algorithm	6-24	<hr/>		
6.16.1	Disadvantages	6-26	Chapter 7 : Internet Protocol 7-1 to 7-44		
6.16.2	Looping in Distance Vector Routing Protocol	6-26	Syllabus : Principles of Internetworking : Requirements, Connectionless operation, Internet Protocol Operation : IP packet, IP addressing : Classful and Classless, Subnet and Supernet addressing, IPv4, IPv6 (IPv6 Datagram format, Comparison with IPv4 and Transition from IPv4 to IPv6).		
6.16.3	Count to Infinity Problem	6-27	7.1	Principle of Internetworking	7-2
6.16.4	Split Horizon Algorithm	6-28	7.1.1	Why Internetworking ?	7-2
6.17	Link State Routing	6-28	7.1.2	The Problems in Internetworking	7-2
6.17.1	Advantage of LSR	6-29	7.1.3	Dealing with Incompatibility Issue	7-2
6.17.2	Comparison of Link State Routing and Distance Vector Routing	6-29	7.1.4	Requirements of Internetworking	7-4
6.17.3	Advantages and Disadvantages of Dynamic Routing	6-30	7.1.5	Differing Factors in Various Networks	7-4
6.18	Least Cost Algorithms	6-30	7.1.6	Styles of Internetworking	7-4
6.18.1	Dijkstra's Algorithm	6-30	7.1.7	Concatenated Virtual Circuits	7-4
6.19	Bellman-Ford Algorithm	6-35	7.1.8	Connectionless Internetworking	7-5
6.20	Path Vector Routing	6-41	7.1.9	Comparison of Two Styles of Internetworking	7-6
6.20.1	Path Vector Messages	6-41	7.1.10	Internet as a Connectionless Network	7-6
6.20.2	Loop Prevention	6-41	7.2	Network Layer Protocols	7-6
6.20.3	Path Attributes	6-41			
6.21	Unicast Routing Protocols	6-42			
6.21.1	Routing	6-42			
6.21.2	Cost or Metric	6-42			



7.2.1	Why IP Address ?	7-7	7.6.16	Solved Examples	7-23
7.2.2	Logical Addresses (IP Addresses)	7-7	7.7	Classless Addressing in IPv4	7-27
7.3	Internet Protocol Version 4 (IPv4)	7-7	7.7.1	Variable Length Blocks	7-27
7.3.1	Position of IP	7-8	7.7.2	The Slash Notation (CIDR Notation)	7-28
7.3.2	Internet Protocol (IP)	7-8	7.7.3	Network Mask	7-28
7.3.3	Various Network Layer Protocols	7-9	7.7.4	Extracting the Block Information	7-29
7.3.4	IPv4 Header Format	7-9	7.7.5	Block Allocation	7-32
7.4	Fragmentation	7-13	7.7.6	Relation to Classful Addressing	7-32
7.4.1	Transparent Strategy	7-13	7.7.7	Subnetting	7-32
7.4.2	Non-transparent Strategy	7-14	7.7.8	Designing Subnets	7-33
7.4.3	Maximum Transfer Unit (MTU)	7-14	7.7.9	Finding Information about Each Network	7-33
7.4.4	Fields Related to Fragmentation	7-15	7.7.10	Address Aggregation	7-33
7.5	IPv4 Addresses	7-15	7.8	Special Addresses	7-35
7.5.1	Uniqueness of IP Addresses	7-15	7.8.1	Special Blocks	7-35
7.5.2	Address Space	7-15	7.8.2	All Zeros Address	7-35
7.5.3	Notation	7-16	7.8.3	All one Address-Limited Broadcast Address	7-35
7.5.4	IPv4 Address Format	7-16	7.8.4	Loopback Address	7-35
7.6	Classful Addressing	7-16	7.8.5	Private Addresses	7-35
7.6.1	IPv4 Address Classes	7-16	7.8.6	Multicast Addresses	7-35
7.6.2	Formats of Various Address Classes	7-17	7.8.7	Special Addresses in Each Block	7-36
7.6.3	How to Recognize Address Classes ?	7-17	7.8.8	Network Address	7-36
7.6.4	Two Level Addressing	7-18	7.8.9	Direct Broadcast Address	7-36
7.6.5	Extracting Information in a Block	7-18	7.8.10	Options	7-36
7.6.6	Network Address	7-19	7.9	IPv6 (Next Generation IP)	7-37
7.6.7	Network Mask or Default Mask	7-20	7.9.1	Advantages of IPv6	7-37
7.6.8	Default Masks for Different Classes	7-20	7.10	IPv6 Addressing	7-37
7.6.9	Finding Network Address using Default Mask	7-20	7.10.1	IPv6 Address	7-37
7.6.10	Three Level Addressing Subnetting	7-20	7.10.2	Notations	7-37
7.6.11	Special IP Addresses	7-21	7.10.3	Abbreviation	7-38
7.6.12	Limitations of IPv4	7-22	7.11	IPv6 Packet Format	7-39
7.6.13	Classless Addressing	7-22	7.11.1	Payload	7-39
7.6.14	Supernetting	7-23	7.11.2	NAT – Network Address Translation	7-40
7.6.15	Registered and Unregistered Addresses	7-23	7.11.3	Extension Headers	7-41



7.12	Transition from IPv4 to IPv6	7-41	8.6.2	Three Way Handshake Technique	8-14
7.12.1	Transition Strategies	7-42	8.6.3	Connection Release	8-15
7.12.2	Use of IP Addresses	7-42	8.6.4	The Internet Transport Protocols	8-15
7.13	Comparison between IPv4 and IPv6	7-43	8.7	User Datagram Protocol (UDP)	8-15
7.14	Internet Control Protocols	7-44	8.7.1	Responsibilities of UDP	8-16
	• Review Questions	7-44	8.7.2	Advantages of UDP	8-16
Module 5					
<hr/>					
Chapter 8 : Transport Layer			8-1 to 8-40		
<hr/>					
Syllabus : Connection-oriented Transport Protocol Mechanisms : Transmission Control Protocol (TCP) :					
TCP services, TCP header format, TCP three way handshake, TCP state transition diagram. Connectionless transport mechanisms : User Datagram Protocol (UDP) – header. Congestion : Effects of congestion, Congestion control methods, Congestion control in packet switching networks.					
8.1	Introduction	8-2	8.8	UDP Services	8-19
8.2	Transport Layer Duties	8-2	8.8.1	Process to Process Communication	8-19
8.3	Transport Layer Services	8-3	8.8.2	Connectionless Services	8-20
8.3.1	Process-to-Process Communication	8-3	8.8.3	Flow and Error Control	8-20
8.3.2	Addressing Port Number	8-3	8.8.4	Checksum	8-20
8.3.3	Encapsulation and Decapsulation	8-5	8.8.5	Congestion Control	8-20
8.3.4	Multiplexing and Demultiplexing	8-5	8.9	UDP Applications	8-20
8.3.5	Flow Control	8-5	8.10	Transmission Control Protocol (TCP).....	8-21
8.3.6	Flow Control at Transport Layer	8-6	8.10.1	Relationship Between TCP and IP	8-21
8.3.7	Error Control	8-7	8.10.2	Ports and Sockets	8-22
8.3.8	Combination of Flow and Error Control ..	8-8	8.11	TCP Services	8-22
8.3.9	Connectionless and Connection Oriented Services (CLTS & COTS)	8-9	8.11.1	Process to Process Communication	8-22
8.3.10	Quality of Service (QoS)	8-10	8.11.2	Stream Delivery Service	8-23
8.4	Sockets	8-11	8.11.3	Sending and Receiving Buffers	8-23
8.4.1	Socket Types	8-11	8.11.4	Bytes and Segments	8-23
8.4.2	Berkeley Sockets	8-12	8.12	Features of TCP	8-24
8.5	Elements of Transport Protocols	8-13	8.12.1	Numbering System	8-24
8.6	Connection Management	8-13	8.12.2	Flow Control	8-24
8.6.1	Connection Establishment	8-13	8.12.3	Error Control.....	8-24
			8.12.4	Congestion Control	8-24
			8.13	The TCP Protocol	8-25
			8.13.1	TCP Segment	8-25
			8.13.2	The TCP Segment Header	8-25
			8.13.3	Checksum	8-27
			8.13.4	Encapsulation	8-27
			8.14	A TCP Connection	8-28
			8.14.1	TCP Connection Establishment	8-28



<ul style="list-style-type: none"> 8.14.2 Connection Termination Protocol8-28 8.14.3 TCP Connection Management8-29 8.14.4 TCP Connection Release8-30 8.15 TCP State Transition Diagram8-30 8.16 Flow Control in TCP.....8-31 <ul style="list-style-type: none"> 8.16.1 Silly Window Syndrome8-32 8.16.2 Nagle's Algorithm8-32 8.17 Quality of Service (QoS)8-33 <ul style="list-style-type: none"> 8.17.1 Techniques for Achieving Good QoS ...8-33 8.17.2 Traffic Shaping8-33 8.17.3 Leaky Bucket Algorithm8-34 8.17.4 Token Bucket Algorithm8-35 8.17.5 Combination of Token Bucket and Leaky Bucket8-36 8.17.6 Resource Reservation8-36 8.17.7 Admission Control8-36 8.18 TCP Congestion Control8-36 <ul style="list-style-type: none"> 8.18.1 Slow Start Algorithm8-37 8.18.2 Internet Congestion Control Algorithm .8-38 8.19 Comparison of UDP and TCP8-39 <ul style="list-style-type: none"> • Review Questions8-39 	<ul style="list-style-type: none"> 9.5 Distribution of Name Space9-5 <ul style="list-style-type: none"> 9.5.1 Hierarchy of Name Servers9-6 9.6 DNS in the Internet9-7 <ul style="list-style-type: none"> 9.6.1 Generic Domains9-7 9.6.2 Country Domain9-7 9.6.3 Inverse Domain9-7 9.7 Name Address Resolution9-7 <ul style="list-style-type: none"> 9.7.1 Recursive Resolution9-8 9.7.2 Iterative Resolution9-8 9.7.3 The DNS Message Format9-9 9.7.4 Caching9-9 9.7.5 DNS Records9-9 9.8 HTTP (Hypertext Transfer Protocol)9-10 <ul style="list-style-type: none"> 9.8.1 Principle of HTTP Operation9-11 9.8.2 The Web and HTTP9-11 9.8.3 Non-persistent and Persistent Connection9-11 9.8.4 HTTP Messages9-13 9.8.5 HTTP Security9-13 9.9 Electronic Mail9-13 <ul style="list-style-type: none"> 9.9.1 E-mail Architecture and Services9-13 9.9.2 Message Formats9-14 9.10 Message Transfer Agent SMTP9-16 <ul style="list-style-type: none"> 9.10.1 Commands and Responses9-16 9.10.2 SMTP (Simple Mail Transfer Protocol)9-16 9.10.3 Components of E-mail System9-17 9.10.4 SMTP Commands9-17 9.10.5 SMTP Operation9-17 9.10.6 Comparison of HTTP and SMTP9-18 9.11 File Transfer Protocol (FTP)9-18 <ul style="list-style-type: none"> 9.11.1 Communication in FTP.....9-19 9.11.2 File Types9-19 9.11.3 Data Structure9-19 9.11.4 Transmission Mode9-20
---	---

Module 6
Chapter 9 : Application Layer 9-1 to 9-34
Syllabus : HTTP, FTP, DNS, SMTP, Internet Telephony and Streaming Multimedia.

<ul style="list-style-type: none"> 9.1 Introduction9-2 <ul style="list-style-type: none"> 9.1.1 Position of Application Layer9-2 9.2 Providing Services9-2 <ul style="list-style-type: none"> 9.2.1 Standard and Non-standard Protocols ...9-3 9.3 Domain Name System (DNS)9-3 <ul style="list-style-type: none"> 9.3.1 How does DNS Work ?9-3 9.3.2 Name Space9-4 9.3.3 Flat Name Space9-4 9.3.4 Hierarchical Name Space9-4 9.4 Domain Name Space9-4
--



9.11.5	File Transfer	9-20	9.16.4	Problems for Multimedia in Today's Internet	9-26
9.12	Internet Telephony / Voice Over IP	9-20	9.16.5	Expectations of Multimedia from the Internet	9-26
9.13	SIP (Session Initiation Protocol)	9-20	9.17	Audio / Video Streaming	9-28
9.13.1	SIP Messages	9-20	9.17.1	Functions Performed by Media Players	9-29
9.13.2	SIP Addresses	9-21	9.17.2	Accessing Audio and Video through a Web Server	9-29
9.13.3	Simple SIP Session	9-21	9.18	Streaming Stored Audio / Video	9-30
9.13.4	Tracking the Celle	9-21	9.18.1	Using a Web Server	9-30
9.14	H.323	9-22	9.18.2	Using a Web Server with a Metafile	9-30
9.14.1	Protocol	9-22	9.18.3	Using a Media Server	9-31
9.14.2	Comparison of H.323 and SIP	9-23	9.18.4	Using a Media Server and RTSP	9-32
9.15	Multimedia	9-24	9.19	Streaming Live Audio and Video	9-32
9.16	Examples of Multimedia Applications	9-24	9.20	Real Time Interactive Audio and Video	9-32
9.16.1	Streaming Stored Audio and Video	9-25		• Review Questions	9-33
9.16.2	Streaming Live Audio and Video	9-25			
9.16.3	Real Time Interactive Audio and Video	9-25			

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