



Sri Indu

College of Engineering & Technology

UGC Autonomous Institution

Recognized under 2(f) & 12(B) of UGC Act 1956,

NAAC, Approved by AICTE &

Permanently Affiliated to JNTUH



HANDOUT

COMPUTER NETWORKS

III Year I Semester

DEPARTMENT OF COMPUTER SCIENCE
&ENGINEERING (AIML)

ACADEMIC YEAR 2025-2026



SRIINDUCOLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA,
NAAC) Sheriguda Village, Ibrahimpatnam Mandal, RangaReddy Dist.–501 510

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (AIML)

HANDOUT-INDEX

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SRIINDUCOLLEGE OF ENGINEERING & TECHNOLOGY

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Sheriguda Village, Ibrahimpatnam Mandal, Ranga Reddy Dist.-501510

VISION OF THE INSTITUTE

To be a premier institution in engineering & technology and management for competency, values and social consciousness.

MISSION OF THE INSTITUTE

IM₁: Provide high quality academic programs, training activities and research facilities.

IM₂: Promote continuous industry-institute interaction aimed at promoting employability, entrepreneurship, leadership and research aptitude among stakeholders.

IM₃: Contribute to the economic and technological development of the region, state and nation.

VISION OF THE DEPARTMENT

To develop competent engineers in the domain of Artificial Intelligence and Machine Learning, Machine Learning for noteworthy contributions to the society.

MISSION OF THE DEPARTMENT

The Department has following Missions:

DM₁: To strengthen academic collaborations for better exposure.

DM₂: Promote professional environment to imbibe ethical values and entrepreneurial skills

DM₃: Encourage research & development by emphasizing on innovation

DM₄: Facilitate Industry-Institute collaboration for mutual benefit

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO₁: Generate contributions towards advancements in Artificial Intelligence and Machine Learning

PEO₂: Promote design, research and implementation of products through strong communication skills, leadership and entrepreneurial skills.

PEO₃: Apply basic principles and practices of AIML to successfully complete software related projects to meet customer business objectives and/or productively engage in research. [Typetext]

Program Outcomes (POs)

PO1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, Natural sciences, and engineering sciences.
PO3	Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate Consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigation of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO8	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO9	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write Effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO10	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, To manage projects and in multidisciplinary environments.
PO11	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

	Program specific Outcomes (PSOs)
PSO1	Diagnose the systems reliability in risk and threat environments.
PSO2	Design and enforce computing based solutions according to the cyber security requirements.
PSO3	Identify professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

COURSEOUTCOMES(CO's)

Academic Year: 2025-26

Class: III YEAR-I SEM.

Course Name: Computer Networks (R22CSE3112)

At the end of the course, the student will be able to

Course Outcomes(COs)	
C224.1	Gain the knowledge of the basic computer network technology.
C224.2	Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
C224.3	Obtain the skills of sub netting and routing mechanisms.
C224.4	Gain the knowledge of routing algorithms and packet switching.
C224.5	Familiarity with the essential protocols of computer networks, and how they Can be applied in network design and implementation.
C224.6	Gain the knowledge of application layer and its protocols.

COURSEARTICULATIONMATRIX

CO	PO														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C224.1	3	1	2	3	-	-	-	-	-	-	3	-	2	3	2
C224.2	3	3	2	1	-	-	-	-	-	-	2	-	3	3	2
C224.3	2	3	2	2	-	-	-	-	-	-	2	-	3	3	2
C224.4	3	3	2	2	-	-	-	-	-	-	1	-	3	2	1
C224.5	3	3	2	2	-	-	-	-	-	-	1	-	3	3	1
C224.6	2	2	2	2							2		3	3	1
C224	2.6	2.5	2.0	2.0	-	-	-	-	-	-	1.8	-	2.8	2.8	1.5

3:High 2. Medium 1.Low

ACADEMIC CALENDAR



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
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Sheriguda (V), Ibrahimpatnam, R.R.Dist, Hyderabad - 501 510

D4

BR-22

Lr.No.SICET/AUTO/DAE/III B.Tech Academic Calendar/29/2025

ANNEXURE -II

B.TECH III-YEAR I-SEM & II-SEM ACADEMIC CALENDAR **(FOR ACADEMIC YEAR : 2025-26)**

Academic Calendar for B.Tech – IIIrd Year Students (2023 - 24 Batch), BR-22 Regulation.

I – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	14.07.2025 (Monday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	14.07.2025 – 13.09.2025	9 Weeks
3.	CRT Classes	15.09.2025 – 07.10.2025	2 Weeks
4.	I Mid Term Examinations.	08.10.2025 – 10.10.2025	2 Days
5.	Submission of I Mid Term Examination Marks.	16.10.2025	3 Days
6.	2 nd Spell of Instructions for Remaining Two and a half Units.	13.10.2025 – 13.12.2025	9 Weeks
7.	II Mid Term Examinations.	15.12.2025 – 17.12.2025	3 Days
8.	Preparation Holidays and Practical Examinations	18.12.2025 – 27.12.2025	1 Week
9.	Submission of II Mid Term Examination Marks.	23.12.2025	
10.	I Semester End Examinations.	29.12.2025 – 10.01.2026	2 Weeks
Commencement of Class-Work for III B.Tech - II Semester 19.01.2026			

Note: No of Working/instructional days : 90

II – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	19.01.2026 (Monday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	19.01.2026 – 14.03.2026	8 Weeks
3.	I Mid Term Examinations.	16.03.2026 – 18.03.2026	3 Days
4.	Submission of I Mid Term Examination Marks.	24.03.2026	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	20.03.2026 – 09.05.2026	7 Weeks
6.	Continuation of remaining 2 nd Spell of Instructions	25.05.2026 – 10.06.2026	1 Week
7.	II Mid Term Examinations.	11.06.2026 – 13.06.2026	3 Days
8.	Preparation Holidays and Project Evaluation.	15.06.2026 – 20.06.2026	1 Week
9.	Submission of II Mid Term Examination Marks.	18.06.2026	
10.	II Semester End Examinations	22.06.2026 – 04.07.2026	2 Weeks

Note: No of Working/instructional days : 93

ACE

CE

DIRECTOR

PRINCIPAL

Controller of Examination
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510

DIRECTOR
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

PRINCIPAL
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

Sign:

Dr. M.V.S.S. Giridhar
Prof. of CEA; JNTUH Nominee

Sign:

Dr. T. Venu Gopal
Prof. of CSE; JNTUH Nominee

Sign:

Dr. D. Ramesh
Prof. of CSE; JNTUH Nominee

(Copy to DAP&E and Copy to all the Dept. Heads)

DEPARTMENT CALENDAR

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(AI&ML) DEPARTMENT CALENDAR – 2025-2026(SEMESTER-I)

SUNDAY				SEPTEMBER					DECEMBER	
MONDAY		JULY		1	IV-I MID I EXAMS				1	IV-I END EXAMS
TUESDAY	1	DEPARTMENT MEETING FOR IV-I & III-I 2025-2026		2	IV-I MID I EXAMS		OCTOBER		2	IV-I END EXAMS
WEDNESDAY	2			3	IV-I MID I EXAMS	1	III-I CRT CLASSESS		3	IV-I END EXAMS
THURSDAY	3		AUGUST	4	IV-I SPELL 2 CLASSES	2	GANDHI JAYANTI & DASHARA		4	IV-I END EXAMS
FRIDAY	4		II- I SPELL I CLASSES COMMENCEMENT	5		3	III-I CRT CLASSESS	NOVEMBER	5	IV-I END EXAMS
SATURDAY	5		DEPARTMENT MEETING	6		4	III-I CRT CLASSESS	1	WOKSHOP UNDER AI LUB	6
SUNDAY	6			7		5		2		7
MONDAY	7	IV- I SPELL I CLASSES COMMENCEMENT		8		6	III-I CRT CLASSESS	3		8
TUESDAY	8			9		7	III-I CRT CLASSESS	4		9
WEDNESDAY	9			10	IV-I MID I EXAMS SUBMISSION	8	III-I MID I EXAMS & II-I MID I EXAMS	5		10
THURSDAY	10			11		9	III-I MID I EXAMS & II-I MID I EXAMS	6		11
FRIDAY	11			12	DEPARTMENT MEETING REVIEW ON IV-I SLOW LEARNERS	10	III-I MID I EXAMS & II-I MID I EXAMS	7		12
SATURDAY	12	AI CLUB MEETING	WOKSHOP UNDER AI LUB	13	AI CLUB MEETING	11		8		13
SUNDAY	13			14		12		9		14
MONDAY	14	III-I SPELL I CLASSES COMMENCEMENT		15	III-I CRT CLASSESS	13	II-I & III-I SPELL 2 CLASSESS	10		15
TUESDAY	15			16	III-I CRT CLASSESS	14		11		16
WEDNESDAY	16			17	III-I CRT CLASSESS	15		12		17
THURSDAY	17			18	III-I CRT CLASSESS	16	II-I & III-I MID I EMARKS SUBMISSION	13		18
FRIDAY	18		INDEPENDENCE DAY	19	III-I CRT CLASSESS	17	DEPARTMENT MEETING REVIEW ON III-I& II-I SLOW LEARNERS	14		19
SATURDAY	19			20	III-I CRT CLASSESS	18	AI CLUB MEETING	15		20
SUNDAY	20			21	BATHUKAMMA	19		16		21
MONDAY	21	BONALU HOLIDAY		22	III-I CRT CLASSESS	20	DIWALI	17		22
TUESDAY	22			23	III-I CRT CLASSESS	21		18		23

COMPUTER NETWORKS

SYLLABUS

BR22 – B.TECH. – CSE(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY (An Autonomous Institution under UGC, New Delhi)

B.Tech. - III Year – I Semester

L	T	P	C
3	0	0	3

(R22CSE3112) COMPUTER NETWORKS

Course Objectives:

1. The objective of the course is to equip the students with a general overview of the concepts and fundamentals of computer networks.
2. Familiarize the students with the standard models for the layered approach to communication between machines in a network and the protocols of the various layers.

Course Outcomes:

1. Gain the knowledge of the basic computer network technology.
2. Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
3. Obtain the skills of subnetting and routing mechanisms.
4. Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.

UNIT - I

Network hardware, Network software, OSI, TCP/IP Reference models, Example Networks: ARPANET, Internet. Physical Layer: Guided Transmission media: twisted pairs, coaxial cable, fiber optics, Wireless transmission.

UNIT - II

Data link layer: Design issues, framing, Error detection and correction. Elementary data link protocols: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channel. Sliding Window protocols: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, Example data link protocols. Medium Access sub layer: The channel allocation problem, Multiple access protocols: ALOHA, Carrier sense multiple access protocols, collision free protocols. Wireless LANs, Data link layer switching.

UNIT - III

Network Layer: Design issues, Routing algorithms: shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing, Congestion Control Algorithms, Quality of Service, Internetworking, The Network layer in the internet.

UNIT - IV

Transport Layer: Transport Services, Elements of Transport protocols, Connection management, TCP and UDP protocols.

UNIT - V

Application Layer –Domain name system, SNMP, Electronic Mail; the World WEB, HTTP, Streaming audio and video.

TEXT BOOK:

1. Computer Networks -- Andrew S Tanenbaum, David. j. Wetherall, 5th Edition, Pearson Education/ PHI

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks-S. Keshav, 2nd Edition, Pearson Education
2. Data Communications and Networking – Behrouz A. Forouzan, Third Edition TMH.

	SRI INDU COLLEGE OF ENGG & TECH LESSONPLAN (Regulation :R22) Department of AIML			Prepared on March-25-2026	
	Sub.Code & Title		R22CSE3112COMPUTER NETWORKS		
	AcademicYear:2025-26		Year/Sem./Section		III-I
	Faculty Name & Designation		M.AVINASH , ASST.PROFESSOR		

Unit/Item No.	Topic(s)	Book Reference	Page(s)		Teaching Methodology	Proposed No.of Periods	Actual Date of Handled	CO/RBT
			From	To				
	UNIT-I							
I	Physicallayer					13		
1.1	Introduction to computer network	T1	23	25	Black board	01		CO1/L2
1.2	Network hardware	T1	39	40	Black board	02		CO1/L1
1.3	Types of networks and topologies	T1	41	50	Black board	01		CO1/L2
1.5	Network software	T1	51	63	Black board	01		CO1/L2
1.6	OSI model	T1	63	67	Black board	01		CO1/L1
1.7	TCP/IP Reference models	T1	67	70	Black board	01		CO1/L2
1.8	Example Networks: ARPANET, Internet.	T1	76	80	Black board	01		CO1/L1
1.9	Physical layer: Guided Transmission media	T1	115	119	Presentation	01		CO1/L3
1.10	Twisted pairs, coaxial cable, fiber optics	T1	116	119	Presentation	02		CO1/L4
1.11	Wireless transmission media	T1	125	129	Black board	02		CO1/L1
	Review	Signature of the HOD/Coordinator						
Unit/ItemNo.	Topic(s)	Book Reference	Page(s)		Teaching Methodology	Proposed No.of Periods	Actual Date of Handled	CO/RBT
UNIT-II								
II	DATALINKLAYER					10		
2.1	Data link layer: Design issues	T1	214	216	Black board	01		CO/L1
2.2	framing	T1	217	219	Black board	01		CO2/L2
2.3	Elementary data link protocols :simplex protocol	T1	193	195	Blackboard	01		CO2/L1
2.4	A simplex stop and wait protocol for an error-free and noisy channel.	T1	381	382	Blackboard	01		CO2/L1
2.5	Sliding Window protocols: A one-bit	T1	379	381	Blackboard	02		CO2/L1

	Sliding window protocol							
2.6	A protocol using Go-Back-N, selective Repeat	T1	494	502	Black board	01		CO2/L2
2.7	Medium Access sub layer: The channel allocation problem	T1	494	495	Blackboard	01		CO2/L3
2.8	Multiple access protocols: ALOHA,CSMA	T1	495	501	Blackboard	01		CO2/L3
2.9	Collision free protocols, Wireless LANs, Data link layer switching.	T1	495	501	Blackboard	01		CO2/L3
	Review	Signature of the HOD/Coordinator						
UNIT-III								
III	NETWORKLAYER					14		
3.1	Design issues	T1			Blackboard	01		CO3/L3
3.2	Routing algorithms: shortest path routing	T1	512	514	Presentation	01		CO3/L3
3.3	Flooding, Hierarchical routing, Broad cast, Multicast.	T1	516	522	Black board	01		CO3/L1
3.4	Distance vector routing	T1	523	526	Presentation	01		CO3/L1
3.5	Congestion control algorithms	T1	528	530	Black board	01		CO3/L3
3.6	Quality of service				Black board	01		CO3/L1
3.7	Internet working	T1	532	536	Black board	01		CO3/L2
3.8	The network layer in the internet	T1	539	541	Presentation	01		CO3/L3
3.9	Transport layer: Transport service	T1	542	545	Presentation	01		CO3/L1
3.10	Elements of transport protocols	T1	567	572	Black board	01		CO3/L2
3.11	Connection management	T1	578	582	Black board	02		CO3/L2
3.12	TCP protocol	T1	590	592	Black board	01		CO3/L4
3.13	UDP protocol	T1	594	597	Presentation	01		CO3/L1
	Review	Signature of the HOD/Coordinator						
UNIT-IV								
IV	TRANSPORTLAYER					10		
4.1	Transport services	T1	737	741	Presentation	01		CO4/L2
4.2	Elements of transport protocol	T1	737	741	Presentation	01		CO4/L2
4.3	Connection management	T1	743	790	Black board	01		CO4/L5
4.4	TCP protocol	T1	743	790	Black board	01		CO4/L1
4.5	UDP Protocols	T1	743	790	Black board	01		CO4/L2

	Review	Signature of the HOD/Coordinator	
UNIT-V			
V	APPLICATION LAYER		11

5.1	Application layer	T1	737	741	Seminar	01		CO5/L2
5.2	Domain name system	T1	737	741	Black board	01		CO5/L2
5.3	SNMP	T1	743	790	Black board	01		CO5/L5
5.4	Electronic Mail	T1	743	790	Black board	02		CO5/L1
5.5	The World WEB	T1	743	790	Seminar	01		CO5/L2
5.8	HTTP	T1	820	832	Black board	01		CO5/L3
5.9	Streaming audio and video	T1	876	891	Black board	02		CO5/L1
	Review	Signature of the HOD/Coordinator						

	SRI INDU COLLEGE OF ENGG & TECHNOLOGY			Prepa red on Rev1: Pages: 12
	QUESTION BANK			
	(Regulation :R22)			
	Department of CSE(AIML)			
Sub. Code & Title	R22CSE3112/Computer Networks			
Academic Year: 2025-26		Year/Sem./Section	III B.TECH, I-SEM	
Faculty Name & Designation		Mr. M. AVINASH, Assistant Professor		

UNIT-

UNIT I

Multiple Choice Questions		BT Level	Course Outcome
#1C-1	What is a computer network? a) A device used to display information on a computer screen b) A collection of interconnected computers and devices that can communicate and share resources c) A type of software used to create documents and presentations d) The physical casing that protects a computer's internal components	I	C01
#1C-2	What is internet? a) A network of interconnected local area networks b) A collection of unrelated computers c) Interconnection of wide area networks d) A single network	IV	C01
#1C-3	. Which of the following is an example of Bluetooth? a) wide area network b) virtual private network c) local area network d) personal area network	III	C01
#1C-4	Which of the following computer networks is built on the top of another network? a) overlay network b) prime network c) prior network d) chief network	I	C01
#1C-5	What is the full form of OSI? a) optical service implementation b) open service Internet c) open system interconnection d) operating system interface	III	C01
#1C-6	When a collection of various computers appears as a single coherent system to its clients, what is this called? a) mail system b) networking system c) computer network d) distributed system	II	C01
#1C-7	How many layers are there in the ISO OSI reference model? a) 7	I	C01

	b) 5 c) 4 d) 6		
#1C-8	What are nodes in a computer network? a) the computer that routes the data b) the computer that terminates the data c) the computer that originates the data d) all of the mentioned	VI	C01
#1C-9	How is a single channel shared by multiple signals in a computer network? a) multiplexing b) phase modulation c) analog modulation d) digital modulation	II	C01
#1C-10	Which of the following devices forwards packets between networks by processing the routing information included in the packet? a) firewall b) bridge c) hub d) router	I	C01
#1C-11	What is the term for an endpoint of an inter-process communication flow across a computer network? a) port b) machine c) socket d) pipe	I	C01
#1C-12	Which one of the following is not a function of network layer? a) congestion control b) error control c) routing d) inter-networking	II	C01
#1C-13	Who introduced the concept of parity bits in Hamming codes? a) Richard Hamming b) Claude Shannon c) Alan Turing d) Donald Knuth	III	C01
#1C-14	Which of the following is not a type of network software? A) Web browsers B) Operating systems C) Word processors D) Firewall software	I	C01
#1C-15	What is the primary function of a router in a computer network? A) Transmit data between devices within the same network B) Connect devices to the Internet C) Determine the best path for data to travel between networks D) Provide centralized storage for network data	IV	C01

	Filling The Blank Questions			
1F-1	OSI stands for _____	II	C01	
1F-2	TCP/IP model does not have _____ layer but OSI model have this layer.	IV	C01	
1F-3	TCP/IP model was developed _____ the OSI model.	I	C01	
1F-4	Transmission data rate is decided by _____	I	C01	
1F -5	The physical layer is responsible for _____	III	C01	
1F -6	The _____ layer of the OSI Model is responsible for establishing, managing, and terminating connections.	I	C01	
1F -7	The data link layer is responsible for _____ communication between adjacent nodes over a link.	I	C01	
1F -8	Hamming Code is a type of _____ error-correcting code used in digital communication	II	C01	
1F -9	_____ is a protocol that allows for the secure transmission of email messages over the internet.	VI	C01	
1F -10	A _____ is a device that connects multiple network segments together to form a larger network, often used to extend the reach of a LAN	I	C01	
1F -11	Fiber optics transmit data using _____.	III	C01	
1F -12	The core of a fiber optic cable is typically made of _____.	V	C01	
1F -13	Coaxial cables consist of an inner conductor surrounded by a/an _____.	I	C01	
1F -14	Coaxial cables offer better _____ than twisted pair cables.	II	C01	
1F -15	The purpose of the outer conductor in coaxial cables is to _____.	II	C01	
Match The Following Questions				
1M-1	1. OSI reference model	i)Allows for multiple packets to be sent before receiving acknowledgments	a)	
	2. Data Link Layer	ii)Responsible for addressing, routing, and delivering packets across networks		
	3. Network Layer	iii)Deals with physical addressing, error detection, and framing of data packets.	II	C01
	4. Sliding Window Protocol	iv)Facilitates interoperability and communication between different systems.		
1M-2	A. Core	i. Provides mechanical protection to the fiber.	b)	
	B. Cladding	ii. Surrounds the core and ensures total internal reflection.	III	C01
	C. Buffer	iii. Innermost part of the fiber where light travels.		
	D. Jacket	iv. Outer protective layer of the fiber cable.		

1M-3		A. Application Layer(TCP/IP)	i. Responsible for logical addressing and routing.		c)		
		B. Transport Layer(TCP/IP)	ii. Provides end-to-end communication services for applications.		II	C01	
		C. Internet Layer(TCP/IP)	iii. Manages data flow and ensures reliability.				
		D. Network Interface Layer(TCP/IP)	iv. Handles physical transmission of data				
1M-4		A. HTTP	i. Application Layer		d)		
		B. TCP	ii. Transport Layer		i)		
		C. IP	iii. Internet Layer		ii) I	C01	
		D. Ethernet	Network Interface Layer				
1M-5		1. OSI reference model	i)Allows for multiple packets to be sent before receiving acknowledgments		e)		
		2. Data Link Layer	ii)Responsible for addressing, routing, and delivering packets across networks				
		3. Network Layer	iii)Deals with physical addressing, error detection, and framing of data packets.		i) II	C01	
		4. Sliding Window Protocol	iv)Facilitates interoperability and communication between different systems.		ii)		

5 MARKS QUESTIONS

1D-1	Explain in detail about OSI model?	I	C01
1D-2	Explain in detail about network hardware?	I	C01
1D-3	Explain TCP/IP reference Model?	II	C01
1D-4	Explain in detail about network software?	II	C01
1D-5	Compare OSI models and TCP/IP in detail?	III	C01
1D-6	Discuss briefly about Guided Transmission Media with diagrams (R15-March -2017)	I	C01
1D-7	Discuss briefly about wireless transmission?	I	C01
1D-8	Explain in detail about fiber optics?	V	C01
1D-9	Explain the concepts of Unguided Transmission media with diagrams? (R15-November - 2016)	IV	C01
1D-10	Difference between Guided transmission Media and Unguided transmission media?	IV	C01
1D-11	What are the key layers of the TCP/IP reference model, and how do they compare to the OSI model?	II	C01
1D-12	How does the TCP/IP reference model facilitate communication between devices over a network?	IV	C01
1D-13	Can you explain the functions of each layer in the TCP/IP reference model, such as the application layer, transport layer, internet layer, and link layer?	V	C01

1D-14	What are some examples of protocols used at each layer of the TCP/IP reference model, and how do they contribute to network communication?	I	C01
1D-15	How does the TCP/IP reference model differ from other networking models in terms of its structure and functionality?	III	C01
UNIT-II			
Multiple Choice Questions		BT Level	Course Outcome
2C-1	Which layer provides the services to user? a) physical layer b) presentation layer c) session layer d) application layer	II	C02
2C-2.	Which connection is necessary for a computer to join the internet? a) internet society b) internet service provider c) different computer d) internet architecture board	II	C02
2C-3.	Which of the following allows you to connect and login to a remote computer? a) SMTP b) HTTP c) FTP d) Telnet	I	C02
2C-4.	Which of the following tasks is not done by data link layer? a) framing b) error control c) flow control d) channel coding	V	C02
2C-5.	When 2 or more bits in a data unit has been changed during the transmission, the error is called _____ a) random error b) burst error c) inverted error a) d) double error	III	C02
2C-6.	Which of the following is a data link protocol? a) ethernet b) point to point protocol c) hdlc d) all of the mentioned	II	C02
2C-7.	Which of the following is the multiple access protocol for channel access control? a) CSMA/CD b) CSMA/CA c) Both CSMA/CD & CSMA/CA d) HDLC	VI	C02
2C-8.	CRC stands for _____ a) cyclic redundancy check b) code repeat check	IV	C02

	c) code redundancy check d) cyclic repeat check		
2C-9.	The data link layer takes the packets from _____ and encapsulates them into frames for transmission. a) network layer b) physical layer c) transport layer d) application layer	V	CO2
2C-10.	Header of a frame generally contains _____ a) synchronization bytes b) addresses c) frame identifier d) all of the mentioned	III	CO2
2C-11.	What is the purpose of using a sliding window protocol in data communication? A) To ensure reliable and sequential delivery of data packets B) To maximize the utilization of network bandwidth C) To minimize the effects of network congestion D) To synchronize the clocks of communicating devices	II	CO2
2C-12.	Simplex Stop-and-Wait Protocol: In a simplex stop-and-wait protocol, what does "stop-and-wait" imply? A) The sender waits for an acknowledgment before sending the next frame B) The receiver stops the flow of data until it receives the next frame C) Both sender and receiver stop transmitting simultaneously D) The sender waits indefinitely for acknowledgment from the receiver	I	CO2
2C-13.	Which of the following best describes the ALOHA protocol? A) A multiple access protocol for satellite communication B) A collision detection protocol for Ethernet networks C) A reservation-based protocol for cellular networks D) A random access protocol for shared medium networks	III	CO2
2C-14.	In a sliding window protocol, what does the window size represent? A) The maximum number of bits that can be sent in one frame B) The maximum number of frames that can be sent without acknowledgment C) The size of the physical window on the sender's device D) The maximum number of frames that can be transmitted in a given time interval	IV	CO2
2C-15	Which of the following statements is true regarding the simplex stop-and-wait protocol? A) It is only suitable for half-duplex communication channels B) It is immune to errors in the transmission medium C) It requires bidirectional communication channels D) It achieves high throughput by allowing continuous transmission without waiting for acknowledgments.	V	CO2
	Filling The Blank Questions		
2F-1	The data link layer takes the packets from _____ and encapsulates them into frames for transmission.	II	CO2
2F-2	Header of a frame generally contains _____	II	CO2
2F-3	In computer network nodes are _____	I	CO2

2F-4	A _____ is a device that forwards packets between networks by processing the routing information included in the packet.	I	C02
2F-5	Network congestion occurs _____	IV	C02
2F-6	In a sliding window protocol, the _____ represents the maximum number of frames that can be sent without receiving an acknowledgment.	I	C02
2F-7	ALOHA protocol can be classified into _____ and slotted ALOHA based on how they handle channel access	V	C02
2F-8	A simplex stop-and-wait protocol is a type of _____ where the sender sends one frame and waits for an acknowledgment before sending the next frame.	VI	C02
2F-9	In a simplex stop-and-wait protocol, the receiver sends _____ to acknowledge the successful reception of a frame.	III	C02
2F-10	ALOHA is a _____ access control protocol that allows stations to transmit data whenever they have it without checking for the status of the channel.	I	C02
2F-11	ALOHA protocol suffers from _____ because stations may collide when attempting to transmit data simultaneously.	II	C02
2F-12	In a sliding window protocol, the _____ is used to control the flow of data and ensure reliable transmission.	II	C02
2F-13	The sliding window protocol uses _____ to acknowledge the successful reception of frames by the receiver.	IV	C02
2F-14	In a simplex stop-and-wait protocol, the sender waits for an _____ from the receiver before sending the next frame.	IV	C02
2F-15	In a sliding window protocol, the sender can send multiple frames up to the size of the _____ without waiting for acknowledgments.	II	C02

Match The Following Questions

2M-1		List I	List II		II	C02
		a) Utopia simplex protocol	i) important in protocols like TCP (Transmission Control Protocol) used in the Internet Protocol Suite.			
		b) stop-and-wait protocol	ii) Protocols in which the sender waits for a positive acknowledgment before advancing to the next data item			
		c) ARQ (Automatic Repeat reQuest)	iii) Protocols in which the sender sends one frame and then waits for an acknowledgment			

			t before proceeding			
		d) Sliding Window Protocol	iv) Does not handle error correction			
2M-2		List I	List II		I	CO2
		A. Sliding Window Protocol	i) This protocol allows for continuous sending of frames without waiting for acknowledgments			
		B. Simplex Stop-and-Wait Protocol	ii) This protocol ensures reliable communication by resending frames when acknowledgment is not received within a certain time window.			
		C. It is a basic protocol suitable for half-duplex communication where data can only flow in one direction at a time.	iii) It is a basic protocol suitable for half-duplex communication where data can only flow in one direction at a time.			
		D. Go-Back-N Protocol	iv) This protocol introduces a window mechanism to improve the efficiency of data transfer by allowing multiple frames to be in transit simultaneously.			
2M-3		List I	List II		II	CO2
		A) Utopia simplex protocol	i) important in protocols like TCP (Transmission Control Protocol) used in the Internet Protocol Suite.			
		B) stop-and-wait protocol	ii) Protocols in which the sender waits for a positive acknowledgement			

			t before advancing to the next data item			
		C) ARQ (Automatic Repeat reQuest)	iii)Protocols in which the sender sends one frame and then waits for an acknowledgement before proceeding			
		D) Sliding Window Protocol	iv)Does not handle error correction			
2M-4		List I	List II		I	CO2
		A)Utopia simplex protocol	i)important in protocols like TCP (Transmission Control Protocol) used in the Internet Protocol Suite.			
		B)stop-and-wait protocol	ii)Protocols in which the sender waits for a positive acknowledgement before advancing to the next data item			
		C)ARQ (Automatic Repeat reQuest)	iii)Protocols in which the sender sends one frame and then waits for an acknowledgement before proceeding			
		D)Sliding Window Protocol	iv)Does not handle error correction			
2M-5		List I	List II		III	CO2
		A)Utopia simplex protocol	i)important in protocols like TCP (Transmission Control Protocol) used in the Internet Protocol Suite.			

		B)stop-and-wait protocol	ii)Protocols in which the sender waits for a positive acknowledgement before advancing to the next data item			
		C)ARQ (Automatic Repeat reQuest)	iii)Protocols in which the sender sends one frame and then waits for an acknowledgement before proceeding			
		D)Sliding Window Protocol	iv)Does not handle error correction			

5 MARKS QUESTIONS

2D-1	Explain about ALOHA and its type? (R16- Nov-Dec-2018)	II	CO2
2D-2	Discuss the working of CSMA protocol along with Persistence Methods diagram? (R16- Nov-Dec-2017)	VI	CO2
2D-3	Discuss the working of CSMA/CD protocol.(R16- Nov-Dec-2017)	VI	CO2
2D-4	Write short notes on collision free protocols. (R15- March - 2017)	I	CO2
2D-5	Elaborate CSMA/ CA protocol?	VI	CO2
2D-6	Write short notes on Evolution of Ethernet along with Ethernet Frame format? (R13-Nov-Dec-2018)	I	CO2
2D-7	Discuss about physical properties, and medium access protocol of Ethernet.(R13-Nov-Dec-2018)	VI	CO2
2D-8	Describe about MAC sub layer?	IV	CO2
2D-9	Describe the working of Spanning tree bridges (R13-Nov - Dec - 2018)	IV	CO2
2D-10	Write short notes on Ethernet physical layer. (R15- March - 2017)	I	CO2
2D-11	Explain the concept of a sliding window protocol and how it enhances data transmission efficiency compared to simpler protocols. What are the key components of a sliding window protocol and how do they contribute to its functionality?	V	CO2
2D-12	Compare the performance characteristics of the Go-Back-N protocol with those of the Selective Repeat protocol. What are the main differences in their approaches to dealing with lost or corrupted packets? Under what circumstances would one protocol be preferred over the other in a practical networking scenario?	III	CO2
2D-13	2. Compare and contrast the simplex stop-and-wait protocol with the sliding window protocol. What are the advantages and disadvantages of each approach in terms of throughput, efficiency, and complexity? Provide examples of scenarios where each protocol would be most suitable.	I	CO2
2D-14	Discuss the operation of the Go-Back-N protocol in the context of reliable data transmission over a noisy channel. How does Go-Back-N handle packet loss and ensure data integrity? What are the limitations of the Go-Back-N approach, particularly in scenarios with high latency or variable delay?	II	CO2
2D-15	3. Describe the ALOHA protocol and its variants (pure ALOHA and slotted ALOHA). How does ALOHA manage access to a shared communication channel, and what are the main challenges associated with its operation? Discuss the trade-offs between	I	CO2

	throughput and collision probability in ALOHA-based systems.		
UNIT-III			
Multiple Choice Questions		BT Level	Course Outcome
3C-1	The network layer is concerned with _____ of data. a) bits b) frames c) packets a) d) bytes	I	CO3
3C-2	Which one of the following is not a function of network layer? a) routing b) inter-networking c) congestion control d) error control	II	CO3
3C-3	A 4 byte IP address consists of _____ a) only network address b) only host address c) network address & host address d) network address & MAC address	I	CO3
3C-4	Which of the following routing algorithms can be used for network layer design? a) shortest path algorithm b) distance vector routing c) link state routing a) d) all of the mentioned	II	CO3
3C-5	Which of the following is an error correcting code? a) Checksum b) Parity c) Cyclic redundancy check a) d) Hamming codes	I	CO3
3C-6	Which of the following is not an error detecting code? a) Hamming code b) Checksum c) Parity check a) d) Cyclic redundancy check	II	CO3
3C-7	Which one of the following algorithm is not used for congestion control? a) traffic aware routing b) admission control c) load shedding a) d) routing information protocol	I	CO3
3C-8	ICMP is primarily used for _____ a) error and diagnostic functions b) addressing c) forwarding d) routing	II	CO3

3C-9	What is the hamming distance between the words 1010101, 1100110? a) 4 b) 5 c) 8 d) 3	I	CO3
3C-10	What is the disadvantage of the burst errors over single bit errors in error detection and correction? a) Difficult to correct b) Difficult to detect c) High error rate d) Frequent occurring	III	CO4
3C-11	Which of the following is not a design issue in the network layer? a) Routing b) Error control c) Congestion control d) Interoperability	IV	CO4
3C-12	Which routing algorithm is commonly used in the Internet due to its simplicity and scalability? a) Dijkstra's algorithm b) Bellman-Ford algorithm c) Distance Vector Routing d) Link State Routing	III	CO4
3C-13	Which of the following is a characteristic of source-based routing? a) Intermediate nodes determine the route b) Only the source node determines the route c) Route is determined based on destination node d) Route is determined based on distance vector updates	IV	CO4
3C-14	In which congestion control algorithm does the sender continually increase its transmission rate until a packet loss occurs, then reduces its transmission rate? a) Slow Start b) Fast Recovery c) Congestion Avoidance d) Selective Repeat	III	CO4
3C-15	Which algorithm dynamically adjusts the window size based on network conditions to maximize throughput and minimize congestion? a) Leaky Bucket b) Token Bucket c) Sliding Window d) TCP Tahoe	V	CO4
Filling The Blank Questions			
3F-1	There are _____ total features of Frame Relay.	I	CO3
3F-2	Frame Relay is cheaper than other _____	I	CO3

3F-3	Most packet switches use this principle _____			II	C03	
3F-4	A local telephone network is an example of a _____ network.			II	C03	
3F-5	Multiplexing is used in _____			I	C03	
3F-6	In network layer design, _____ ensures that data packets are delivered to the correct destination network.			II	C03	
3F-7	_____ is a routing algorithm that uses distance vectors and hop counts to determine the best path.			I	C03	
3F-8	The primary goal of congestion control algorithms is to _____.			II	C03	
3F-9	In network layer design, _____ prevents loops in routing by ensuring that packets follow a predetermined path.			I	C04	
3F-10	_____ is a routing algorithm that calculates the shortest path based on network topology.			III	C04	
3F-11	The purpose of Quality of Service (QoS) in network layer design is to _____.			IV	C04	
3F-12	In congestion control algorithms, _____ dynamically adjusts transmission rates based on network congestion levels.			III	C04	
3F-13	_____ is a network layer design issue concerned with efficiently utilizing available network resources.			IV	C04	
3F-14	_____ is a routing algorithm that employs link-state information to construct a complete graph of the network.			III	C04	
3F-15	_____ is an important aspect of congestion control algorithms that aims to ensure fair access to network resources for all users.			VI	C04	
	Match The Following Questions					
3M-1		a)state information in datagram network	i) Route chosen when VC is set up; all packets follow it		I	C03
		b) Quality of service in Virtual-circuit network	ii) Each packet is routed independently			
		c) Routing in datagram network	iii) Easy if enough resources can be allocated in advance for each VC			
		d) Routing in Virtual-circuit network	iv) Routers do not hold state information			
3M-2		A. Addressing	i)Ensures reliable delivery of data within the network.		II	C03
		B. Routing	ii)Assigns unique identifiers to devices within the network			
		C. Error Control	iii). Determines the path data packets take from source to destination.			
		D. Congestion Control	iv)Manages traffic flow to prevent network congestion.			

3M-3		- a. Distance Vector	i) Sends updates about its own routing table to its neighbors periodically.		I	CO4
		- b. Link State	ii. Considers only hop counts to make routing decisions.			
		- c. Path Vector	iii. Utilizes a centralized algorithm to calculate the shortest path.			
		- d. Flooding	iv. Broadcasts packets to all neighbors without any pre-existing knowledge of topology.			
3M-4		- a. IP (Internet Protocol)	i. Resolves IP addresses to MAC addresses.		V	CO4
		- b. ICMP (Internet Control Message Protocol)	ii. Facilitates communication between devices on different networks.			
		- c. ARP (Address Resolution Protocol)	iii. Diagnoses network connectivity issues.			
		- d. DHCP (Dynamic Host Configuration Protocol)	iv. Dynamically assigns IP addresses to devices on a network.			
3M-5		- a. Scalability	i. Ensuring efficient and fair allocation of network resources.		VI	CO4
		- b. Interoperability	ii. Allowing different networks to communicate seamlessly.			
		- c. Security	iii. Protecting data from unauthorized access and malicious attacks.			
		- d. Quality of Service (QoS)	iv. Handling growth in the number of users and network size without performance degradation			
3D-1	Elaborate Network layer design issues with neat diagrams?				I	CO3
3D-2	Explain about store and forward packet switching. (R15- December-2018)				II	CO3
3D-3	Explain Dijkstra’s algorithm in detail. (R16- April/May-2018)				I	CO3
3D-4	Discuss in detail about Connection - Oriented and Connectionless Services in detail. (R16- April/May-2018)				II	CO3
3D-5	Elaborate Routing Algorithm and Classifications?				I	CO3
3D-6	Explain Bellman Ford algorithm in detail. (R16- April/May-2018)				II	CO3

3D-7	Elaborate Distance Vector Routing with an example? (R15- December-2018)?	I	CO3
3D-8	Write a detailed note on hierarchical routing. (R16- Nov-Dec-2018)	II	CO3
3D-9	Explain in detail about congestion control algorithms. (R16- April/May-2018)	I	CO4
3D-10	Discuss in detail about Optimality principle?	III	CO4
3D-11	Discuss the fundamental design issues in the network layer and their impact on overall network performance.	IV	CO4
3D-12	How does Quality of Service (QoS) play a crucial role in modern network architectures? Explain the key components of QoS and their implementation challenges.	III	CO4
3D-13	Compare and contrast various congestion control algorithms used in computer networks. Which factors influence the choice of a specific algorithm in different network scenarios?	IV	CO4
3D-14	Describe the concept of internetworking and its significance in connecting heterogeneous networks. What are the major challenges associated with internetworking, and how are they addressed?	III	CO4
3D-15	Explain the relationship between congestion control algorithms and Quality of Service (QoS) provisioning in network design. How do these two concepts interact to ensure efficient data transmission?	VI	CO4

UNIT IV

Multiple Choice Questions			Course Outcome
4C-1	Transport layer aggregates data from different applications into a single stream before passing it to _____ a) network layer b) data link layer c) application layer d) physical layer	I	CO3
4C-2	Which of the following are transport layer protocols used in networking? a) TCP and FTP b) UDP and HTTP c) TCP and UDP d) HTTP and FTP	II	CO3
4C-3	Which of the following is false with respect to UDP? a) Connection-oriented b) Unreliable c) Transport layer protocol d) Low overhead	I	CO3
4C-4	What is the main advantage of UDP? a. More overload b. Reliable c. Low overhead	II	CO3

	d. Fast		
4C-5	Which of the following is not applicable for IP? a) Error reporting b) Handle addressing conventions c) Datagram format d) Packet handling conventions	I	CO3
4C-6	Which of the following field in IPv4 datagram is not related to fragmentation? a) Flags b) Offset c) TOS d) Identifier	II	CO3
4C-7	If the value in protocol field is 17, the transport layer protocol used is _____ a) TCP b) UDP c) ICMP d) IGMP	I	CO3
4C-8	Which layer is more helpful in providing reliable data transmission service? a) Transport layer b) Datalink layer c) Application layer d) Network layer	II	CO3
4C-9	Which of the following is not a similarity between transport control protocol and user datagram protocol? a) Process-to-process protocol b) Connection-oriented protocol c) Does error checking d) Uses port numbers	I	CO3

4C-10	Internet Control Message Protocol (ICMP) has been designed to compensate _____ a) Error-reporting b) Error-correction c) Host and management queries d) All of the mentioned	III	CO4
4C-11	Which of the following protocols is used at the transport layer of the OSI model? a) IP b) TCP c) HTTP d) FTP	IV	CO4
4C-12	Which transport layer protocol is used to provide connectionless communication? a) TCP b) UDP c) HTTP d) ICMP	III	CO4
4C-13	What mechanism does TCP use to ensure data is delivered reliably? a) Flow control b) Error detection and correction c) Three-way handshake d) All of the above	IV	CO4
4C-14	Which field in the TCP header is used to reassemble the segments into the correct order at the receiving end? a) Source Port b) Sequence Number c) Acknowledgment Number d) Checksum	III	CO4

4C-15	What is the primary purpose of the transport layer in the OSI model? a) Routing data packets between devices b) Providing end-to-end communication services for applications c) Translating domain names into IP addresses d) Managing network hardware connections	V	CO4
Filling The Blank Questions			
4F-1	. Header size of the ICMP message is _____	I	CO5
4F-2	Multiple processes on destinations at transport layer are identified by _____	I	CO5
4F-3	The network layer is concerned with _____ of data.	II	CO5
4F-4	In _____ systems, resources are allocated on demand.	II	CO5
4F-5	A 4 byte IP address consists of _____	I	CO5
4F-6	The primary function of the transport layer is to provide _____ communication between applications.	II	CO5
4F-7	The transport layer protocol that provides reliable, connection-oriented service is _____.	I	CO5
4F-8	_____ is a transport layer protocol used primarily for low-latency, loss-tolerating connections	II	CO5
4F-9	In the TCP three-way handshake process, the three packets exchanged are SYN, SYN-ACK, and _____.	I	CO5
4F-10	_____ is a mechanism used by TCP to ensure that data is transmitted accurately and in the correct order	III	CO5
4F-11	The _____ field in a TCP header specifies the size of the sender's receive window	IV	CO5
4F-12	UDP stands for _____.	III	CO5
4F13	The process of breaking a large message into smaller segments at the transport layer is called _____.	IV	CO5
4F14	A _____ number is used by the transport layer to identify a specific process or service on a host	III	CO5
4F15	The term _____ refers to the dynamic adjustment of the transmission rate based on network conditions, as implemented by TCP.	VI	CO5
Match The Following Questions			

4M-1	<table><tr><th>List I</th><th>List II</th></tr><tr><td>a) SOCKET</td><td>i) Release the connection</td></tr><tr><td>b) BIND</td><td>ii) Announce willingness to accept connections; give queue size</td></tr><tr><td>c) LISTEN</td><td>iii) Associate a local address with a socket</td></tr><tr><td>d) CLOSE</td><td>iv) Create a new communication endpoint</td></tr></table>	List I	List II	a) SOCKET	i) Release the connection	b) BIND	ii) Announce willingness to accept connections; give queue size	c) LISTEN	iii) Associate a local address with a socket	d) CLOSE	iv) Create a new communication endpoint	I	CO5
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4M-5	<table><tr><td>a) TCP</td><td>i) Video conferencing</td></tr><tr><td>b)UDP</td><td>ii) Telecommunication signaling</td></tr><tr><td>c)SCTP</td><td>iii) VoIP (Voice over IP)</td></tr><tr><td>d)RTP</td><td>iv) Web browsing</td></tr></table>	a) TCP	i) Video conferencing	b)UDP	ii) Telecommunication signaling	c)SCTP	iii) VoIP (Voice over IP)	d)RTP	iv) Web browsing	VI	CO4
a) TCP	i) Video conferencing										
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c)SCTP	iii) VoIP (Voice over IP)										
d)RTP	iv) Web browsing										
4D-1	Explain about tunneling? (R16-Nov/Dec-2018)	I	CO5								
4D-2	Elaborate about packet fragmentation? (R16-Nov/Dec-2018)	II	CO5								
4D-3	Explain about IPV4, IPV6? (R15-May-2018)	I	CO5								
4D-4	Explain about IPV6? (R15-May-2018)	II	CO5								
4D-5	Explain about IMCP? (R15-May-2018)	I	CO5								
4D-6	Discuss in detail about ARP & RARP? (R15-Nov/Dec-2017)	II	CO5								
4D-7	Explain in detail about CIDR & DHCP?	I	CO5								
4D-8	Explain about upper layer services provided protocol?	II	CO5								
4D-9	Discuss how a connection is established, released in transport layer? (R13-March-2017)	I	CO5								
4D-10	Explain how a crash is recovered in transport layer? (R13-March-2017)	III	CO5								
4D-11	What are the main responsibilities of the transport layer in the OSI model, and how does it differ from the network layer	IV	CO5								
4D-12	Explain the concept of multiplexing and demultiplexing in the context of the transport layer. How do protocols like TCP and UDP handle these processes	III	CO5								
4D-13	Describe the key differences between TCP (Transmission Control Protocol) and UDP (User Datagram Protocol). In what scenarios is each protocol most appropriately used?	IV	CO5								

4D-14	How does the transport layer ensure reliable data transmission? Discuss the mechanisms used by TCP for error detection and recovery	III	CO5
4D-15	What is flow control, and why is it important in transport layer protocols? Explain how TCP implements flow control using the sliding window mechanism	VI	CO5
UNIT V			
Multiple Choice Questions			Course Outcome
5C-1	Which is not a application layer protocol? a) HTTP b) SMTP c) FTP d) TCP	I	CO6
5C-2	The packet of information at the application layer is called _____ a) Packet b) Message c) Segment d) Frame	II	CO6
5C-3	The application-level protocol in which a few manager stations control a set of agents is called _____ a) HTML b) TCP c) SNMP d) SNMP/IP	I	CO6
5C-4	DNS database contains _____ a) name server records b) hostname-to-address records c) hostname aliases d) all of the mentioned	II	CO6
5C-5	To use a Simple Network Management System, we need _____ a) Servers b) IP c) Protocols d) Rules	I	CO6
5C-6	FTP is built on _____ architecture. a) Client-server b) P2P c) Data centric d) Service oriented	II	CO6
5C-7	Application layer protocol defines _____ a) types of messages exchanged b) message format, syntax and semantics c) rules for when and how processes send and respond to messages d) all of the mentioned	I	CO6
5C-8	Services provided by application layer? a) Web chat b) Error control c) Connection services d) Congestion control	II	CO6

5C-9	Application layer interacts directly with the _____ a) front user b) end user c) sensors d) wired link	I	CO6
5C-10	In wireless ad-hoc network _____ a) access point is not required b) access point is must c) nodes are not required d) all nodes are access points	III	CO6
5C-11	Which of the following protocols operates at the Application layer of the OSI model? - A) TCP - B) IP - C) FTP - D) Ethernet	IV	CO6
5C-12	What is the primary purpose of the Domain Name System (DNS) in computer networks? - A) To assign IP addresses dynamically - B) To resolve human-readable domain names into IP addresses - C) To provide a secure communication channel - D) To transfer files between computers	III	CO6
5C-13	Which of the following is a characteristic of the Hypertext Transfer Protocol (HTTP)? - A) It provides a secure communication channel - B) It is a stateful protocol - C) It is used for transferring web pages - D) It operates at the Network layer	IV	CO6
5C-14	Which of the following services uses the Simple Mail Transfer Protocol (SMTP)? - A) Web browsing - B) File transfer - C) Email sending - D) Remote login	III	CO6
5C-15	What does the acronym URL stand for in the context of the Application layer? - A) Uniform Resource Locator - B) Unified Resource Locator - C) Universal Resource Link - D) Uniform Reference Link	V	CO6
Filling The Blank Questions			
5F-1	In wireless distribution system _____	I	CO6
5F-2	Mostly _____ is used in wireless LAN.	I	CO6
5F-3	The default connection type used by HTTP is _____	II	CO6
5F-4	FTP server _____	II	CO6
5F-5	A DNS client is called _____	I	CO6
5F-6	The Application layer is layer ____ of the OSI model	II	CO6
5F-7	The main function of the Application layer is to provide _____ between the network and end-user applications	I	CO6

5F-8	_____ is a common protocol used at the Application layer for transferring hypertext documents across the internet	II	CO6										
5F-9	_____ (acronym) is the protocol used by email clients to retrieve messages from a mail server.	I	CO6										
5F-10	The protocol used for file transfer over the internet, providing both file upload and download capabilities, is called _____.	III	CO6										
5F-11	The _____ protocol is often used for real-time audio and video communication over IP networks	IV	CO6										
5F-12	_____ (acronym) is a protocol used to securely transfer files over a network, providing encryption for both data and command channels	III	CO6										
5F-13	The protocol that allows users to interact with a remote server as if they were using a local terminal is called _____.	IV	CO6										
5F-14	The Domain Name System (DNS) operates at the Application layer and is responsible for translating _____ into IP addresses	III	CO6										
5F-15	The protocol that allows for automated IP address configuration in a network is known as _____ (acronym).	VI	CO6										
	Match The Following Questions												
5M-1	<table><tr><th>List I</th><th>List II</th></tr><tr><td>a) IPv4 address of a host</td><td>i)Simple Mail Transfer Protocol</td></tr><tr><td>b) IPv6 address of a host</td><td>ii)Email address(es) for blind carbon copies</td></tr><tr><td>c) SMTP</td><td>iii) 128-Bit integer</td></tr><tr><td>d) Bcc</td><td>iv) 32-Bit integer</td></tr></table>	List I	List II	a) IPv4 address of a host	i)Simple Mail Transfer Protocol	b) IPv6 address of a host	ii)Email address(es) for blind carbon copies	c) SMTP	iii) 128-Bit integer	d) Bcc	iv) 32-Bit integer	I	CO6
List I	List II												
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5M-2	<table><tr><th>List I</th><th>List II</th></tr><tr><td>HTTP</td><td>Transfer of web pages</td></tr><tr><td>FTP</td><td>Sending email</td></tr><tr><td>DNS</td><td>. File transfer</td></tr><tr><td>SMTP</td><td>Resolving domain names</td></tr></table>	List I	List II	HTTP	Transfer of web pages	FTP	Sending email	DNS	. File transfer	SMTP	Resolving domain names	II	CO6
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5M-3	<table> <tr> <th>List I</th> <th>List II</th> </tr> <tr> <td>Web Browsing</td> <td>SMTP</td> </tr> <tr> <td>Email</td> <td>FTP</td> </tr> <tr> <td>File Download</td> <td>DNS</td> </tr> <tr> <td>Address Resoluti on</td> <td>HTTP</td> </tr> </table>	List I	List II	Web Browsing	SMTP	Email	FTP	File Download	DNS	Address Resoluti on	HTTP	I	CO6
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Hypertext Transfer Service	Web browsing												
Email Service	Message transfer												
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List I	List II												
80	SMTP												
21	DNS												
53	FTP												
25	HTTP												

5D-1	Explain the WWW in detail. Briefly explain TCP Sliding window? (R15-May-2018)	I	CO6
5D-2	Explain about UDP? (R15-May-2018)	II	CO6
5D-3	What is the need for TCP connection establishment and connection release and explain clearly? (R15-May-2018)	I	CO6
5D-4	Explain in about TCP congestion control. (R15-May-2018)	II	CO6
5D-5	Analyze the TCP header and explain it. (R15-May-2018)	I	CO6
5D-6	Elaborate HTTP & FTP?	II	CO6
5D-7	Explain the message transfer using simple mail transfer protocol?	I	CO6
5D-8	Explain in detail about E-Mail? (R15-May-2018/Nov-Dec-2017)	II	CO6
	Explain in detail about TELNET? (R15-May-2018)	I	CO6

5D-9			
5D-10	Explain in detail about DNS? (R15- May-2018)	III	CO6
5D-11	What are the primary functions and services provided by the Application layer in the OSI model?	IV	CO6
5D-12	How does the Application layer differ from the Presentation and Session layers in the OSI model	III	CO6
5D-13	Can you explain the working of common Application layer protocols like HTTP, FTP, SMTP, and DNS?	IV	CO6
5D-14	What role does the Application layer play in ensuring data integrity and security in network communications	III	CO6
5D-15	How do Application layer protocols handle data formatting, conversion, and compression	VI	CO6

	SRI INDU COLLEGE OF ENGG &TECHNOLOGY		Prepare don March-25-2026
	Department of CSE(AIML)		
	Sub.Code &Title	R22CSE3112COMPUTER NETWORKS	
	AcademicYear:2025-26	Year/Sem./Section	III/I
Faculty Name & Designation		M.AVINASH, ASST.PROFESSOR	

SELFSTUDYTOPICS			
S.No.	Topics	Books&Journals	CourseOutcomes
1	NETWORKSIMULATOR	AndrewSTanenbaum,David. j.Wetherall,5 th Edition	CO5
2	NETWORKMANAGEMENT	AndrewSTanenbaum, David. j. Wetherall, 5 th Edition	CO5

CONTENTBEYONDTHESYLLABUS			
S.No.	Topics	Books&Journals	CourseOutcomes
1	IS:INFORMATIONSECURITY	AndrewSTanenbaum,David. j.Wetherall,5 th Edition	CO5
2	CYBER SECURITY	AndrewSTanenbaum, David. j. Wetherall, 5 th Edition	CO5

WEBLINKS:

<https://www.edx.org/learn/computer-networking>
https://onlinecourses.nptel.ac.in/noc21_cs61/preview

<https://www.edx.org/course/computer-networks>

QUESTIONBANKWITHBLOOMSTAXONOMYLEVEL(BTL)

MID-1MODEL PAPER

BR-20

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

D4

(An Autonomous Institution Under 2(f) and 12(B) of UGC Act 1956, New Delhi)

IIB.Tech-II Semester -I Mid Term Examinations (Model paper)

FUNDAMENTALS OF NETWORKING

Duration: 90 Mins

Max Marks: 25M

Section-A

Answer All the questions

5Qx1M=5M

1. Write OSI layers?
2. List out different types of networks?
3. List the Collision free protocols?
4. Define data link layer switching?
5. Define Distance Vector Routing?

Section-B

Answer any FOUR questions

4Qx5M=20M

6. Explain TCP/IP Reference Model?
7. Differentiate between Guided transmission media and unguided transmission media?
8. Explain about ALOHA and its type?
9. Define the term MAC sublayer and list the approaches?
10. Write in detail about shortest path routing?
11. List the various categories of Congestion Control?

MID-2 MODEL PAPER

BR-20

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

D4

(An Autonomous Institution Under 2(f) and 12(B) of UGC Act 1956, New Delhi)

II B.Tech- II Semester- I Mid Term Examinations (Model paper)

COMPUTER NETWORKS

Duration: 90 Mins

Max Marks: 25M

Section-A

Answer All the questions

5Qx1M = 5M

1. What is Hierarchical Routing?
2. Define Crash Recovery?
3. What is congestion control?
4. Define network security?
5. Define Cryptography?

Section-B

Answer any FOUR questions

4Qx5M = 20M

6. Write in detail about shortest path routing?
7. Differentiate between TCP and UDP?
8. Explain how a crash is recovered in transport layer?
9. Explain in detail about TELNET?
10. Discuss in detail about RTCP?
11. Explain in detail about web security?



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

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III B.Tech. I Semester (REGULAR) End Examinations, January – 2023.

(R20CSE2205) COMPUTER NETWORKS

27/01/2023

(For CSE)

Day- 3 (FN)

Duration: 3 Hrs

Maximum Marks: 70M

Blooms Taxonomy : (I-Remembering, II-Understanding, III-Applying, IV-Analyzing, V-Evaluating and VI-Creating)

Course Outcomes : CO

SECTION-A

Answer ALL the following questions.

(5Qx 4M = 20M)

1. What is Network Hardware? Explain. I CO1
2. Discuss in brief about error detection and error correction in Data link layer. II CO2
3. Discuss about flooding in network layer. II CO3
4. Discuss about connection release in transport layer. II CO4
5. What are domain recourse records? I CO5

SECTION-B

Answer FIVE questions choosing at least one from each unit.

(5Qx10M=50M)

UNIT-I

6. Discuss in detail about TCP/IP reference model in detail. II CO1

OR

7. What is Physical layer? Explain about Transmission media. II CO1

UNIT-II

8. Discuss in detail about Sliding window protocols. II CO2

OR

9. What is Channel allocation problem? Explain about Collision free protocols. II CO2

UNIT-III

10. What is Optimality Principle? Discuss about Distance Vector Routing along with count to infinity problem. VI CO3

OR

11. What are various techniques available for providing Quality Of Service? Explain. I CO3

UNIT-IV

12. Discuss in detail about UDP and Remote Procedure call in detail with their header formats. VI CO4

OR

13. Explain about TCP protocol in detail with its header. II CO4

UNIT-V

14. Discuss about SNMP and POP for electronic mails. II CO5

OR

15. Explain in detail about Domain Name System. II CO5

BR-20

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

D4

III B.Tech - I Semester - II Mid Term Examination, January-2023

(R20CSE2205) COMPUTER NETWORKS

(For CSE)

Duration: 90 Mins

Dt: 03-01-2023, Day-2 (FN)

Max Marks: 25M

Section - AAnswer All the questions

Marks: 5Qx1M = 5M

* (I-Remembering, II-Understanding, III-Applying, IV-Analyzing, V-Evaluating, and VI-Creating.)

	blooms Taxonomy Level	Course Outcomes
1. Write about connection oriented service.	I	CO3
2. What is Hierarchical Routing?	I	CO3
3. What is DHCP?	I	CO4
4. What is ARP, RARP?	I	CO4
5. What are the types of messages in HTTP transactions?	I	CO5

Section - BAnswer any FOUR questions

Marks: 4Qx5M = 20M

6. Explain Dijkstra's algorithm in detail.	II	CO3
7. Explain in detail about congestion control algorithms.	II	CO3
8. Elaborate about packet fragmentation.	VI	CO4
9. Discuss how a connection is established, released in transport layer.	VI	CO4
10. Explain the WWW in detail. Briefly explain TCP Sliding window.	V	CO5
11. Analyze the TCP header and explain it.	IV	CO5

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
III B.Tech - I Semester - I Mid Term Examination, November-2022
(R20CSE2205) COMPUTER NETWORKS

Duration: 90 Mins

Dt: 04-11-2022, Day-2 (FN)

Max Marks: 25M

Section - AAnswer All the questions

Marks: 5Qx1M = 5M

* (I-Remembering, II-Understanding, III-Applying, IV-Analyzing, V-Evaluating, and VI-Creating.)

	<u>Bloom's</u> <u>Taxonomy</u> <u>Level</u>	<u>Course</u> <u>Outcomes</u>
1. What are Guided transmission Media and Unguided transmission media?	II	CO1
2. List out different types of networks.	I	CO1
3. Define Multiple Access protocol and give the categories.	I	CO2
4. What is the Sliding Window protocol?	I	CO2
5. What are the design issues of network layer?	I	CO3

Section - BAnswer any FOUR questions

Marks: 4Qx5M = 20M

6. Explain TCP/IP reference Model.	II	CO1
7. Discuss briefly about wireless transmission.	II	CO1
8. Discuss the working of CSMA/CD protocol.	IV	CO2
9. Write short notes on collision free protocols.	I	CO2
10. Explain about Error Detection and Error Correction.	II	CO2
11. Discuss about Connection-Oriented and Connectionless Services in detail.	VI	CO3