

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VI EXAMINATION – WINTER 2025****Subject Code:3161007****Date:21-11-2025****Subject Name:Computer Networks****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

**MARKS**

<b>Q.1</b>	<b>(a)</b> Which of the OSI layers handles each of the following:	<b>03</b>
	i) Dividing the message into segments.	
	ii) Determining which route through the subnet to use.	
	iii) Dividing the transmitted bit stream into frames.	
<b>(b)</b>	Explain Physical Address, IP address, Port Address and socket address in brief	<b>04</b>
<b>(c)</b>	Explain the functions and protocols and services of each layer?	<b>07</b>
<b>Q.2</b>	<b>(a)</b> Explain functionality of Repeater, HUB, Bridge, Switch, Router and Gateway	<b>03</b>
<b>(b)</b>	With an example explain the process of Error detection using LRC.	<b>04</b>
<b>(c)</b>	What is the window size of sender and receiver sides in selective repeat protocol? Explain with timing diagram.	<b>07</b>
	<b>OR</b>	
<b>(c)</b>	Explain the problem of Count-to-infinity with example in distance vector routing algorithm.	<b>07</b>
<b>Q.3</b>	<b>(a)</b> What is HTTP? Differentiate its persistent and non-persistent types with request-response behaviour of HTTP	<b>03</b>
<b>(b)</b>	Explain the differences between 10 base 2 and 10 base 5 Ethernet.	<b>04</b>
<b>(c)</b>	Generate hamming code of 7bit binary word: ASCII character ‘G’ 1000111 and find the error bit at position 9 respectively and correct it	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	<b>(a)</b> Explain CSMA/CD protocol	<b>03</b>
<b>(b)</b>	What do you mean by random access protocols? Explain slotted ALOHA in brief.	<b>04</b>
<b>(c)</b>	Classify the static and dynamic routing algorithms? Explain the basic concept of flooding.	<b>07</b>
<b>Q.4</b>	<b>(a)</b> Explain NAT (Network Address Translation) as a solution to IP address depletion problem.	<b>03</b>
<b>(b)</b>	A Bit steam 100100 is to be transmitted using standard CRC method with divisor value $x^3+x^2+1$ . Generate the CRC code word.	<b>04</b>
<b>(c)</b>	Write a short note on Network classes. What is the use of subnetting in assigning IP address?	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	<b>(a)</b> Illustrate the Scenarios for establishing a connection using a Three-Way Handshake.	<b>03</b>
<b>(b)</b>	Compare IPv4 and IPv6.	<b>04</b>
<b>(c)</b>	Explain leaky bucket algorithm for the network traffic shaping	<b>07</b>

**Q.5** (a) Explain link state routing algorithm with example in brief. **03**  
(b) What is symmetric encryption and Asymmetric encryption? **04**  
(c) Explain the hierarchical DNS system **07**

**OR**

**Q.5** (a) Write a brief note on FTP and DHCP **03**  
(b) Explain RSA algorithm **04**  
(c) Explain the Data Encryption Standard (DES) in details **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024****Subject Code:3161007****Date:02-12-2024****Subject Name: Computer Networks****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

**MARKS**

<b>Q.1</b>	<b>(a)</b> What is Computer Network? List out few uses of Computer Networks.	<b>03</b>
	<b>(b)</b> Compare OSI model vs. TCP/IP model.	<b>04</b>
	<b>(c)</b> Explain the need for physical layer. Classify and explain Transmission Media.	<b>07</b>
<b>Q.2</b>	<b>(a)</b> List out few design issues for the layers.	<b>03</b>
	<b>(b)</b> Compare: Connection-Oriented Services vs. Connection-Less Services	<b>04</b>
	<b>(c)</b> Explain Stop & Wait ARQ in detail.	<b>07</b>
	<b>OR</b>	
	<b>(c)</b> Draw and explain ISO OSI model.	<b>07</b>
<b>Q.3</b>	<b>(a)</b> What is ARQ? List out major ARQ protocols.	<b>03</b>
	<b>(b)</b> Compare: Circuit Switching vs. Packet Switching	<b>04</b>
	<b>(c)</b> Explain various network topologies with necessary diagrams and examples.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	<b>(a)</b> Explain the terms: Unicasting, Multicasting and Broadcasting	<b>03</b>
	<b>(b)</b> What is Header? What type information Header carry? Also explain need for Header.	<b>04</b>
	<b>(c)</b> What is Framing? Explain need for framing. Discuss byte stuffing and unstuffing in detail.	<b>07</b>
<b>Q.4</b>	<b>(a)</b> Draw and explain about IP addressing in detail.	<b>03</b>
	<b>(b)</b> Draw and explain Wireless LAN in detail.	<b>04</b>
	<b>(c)</b> Explain CSMA/CD with necessary diagrams.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	<b>(a)</b> Explain Hub, Bridge, Switch and Router.	<b>03</b>
	<b>(b)</b> Explain Pure ALOHA with necessary diagrams.	<b>04</b>
	<b>(c)</b> What is Routing? Explain any one routing algorithm in detail with necessary diagrams.	<b>07</b>
<b>Q.5</b>	<b>(a)</b> What is Process to Process communication? Explain how transport layer performs it.	<b>03</b>
	<b>(b)</b> What is HTTP? Draw and explain Client-Server communication.	<b>04</b>
	<b>(c)</b> What is Firewall? Write a note on Network Security.	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	<b>(a)</b> What is Security? Explain need for security in Internet.	<b>03</b>
	<b>(b)</b> Explain User Datagram Protocol in detail.	<b>04</b>
	<b>(c)</b> Write a note on DNS.	<b>07</b>

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3161007****Date:11-12-2023****Subject Name:Computer Networks****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		<b>MARKS</b>
<b>Q.1</b>	(a) Define protocol and interface.	<b>03</b>
	(b) List two ways in which OSI reference model and TCP/IP reference model are the same.	<b>04</b>
	(c) Explain various network topologies in details.	<b>07</b>
<b>Q.2</b>	(a) What are two reasons for using layered protocols?	<b>03</b>
	(b) Which of the OSI layers handles each of following: 1.Dividing the transmitted bit stream into frames. 2.Determining which route through the subnet to use.	<b>04</b>
	(c) What is hamming distance? Explain its role in error detection and error correction using an example.	<b>07</b>
<b>OR</b>		
	(c) Explain stop and wait protocol.	<b>07</b>
<b>Q.3</b>	(a) Differentiate between message switching and packet switching.	<b>03</b>
	(b) Give the usage of I, S, U frames of HDLC frames.	<b>04</b>
	(c) Draw and explain the flow chart/algorithm to calculate a traditional checksum.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Write down the functions of MAC layer.	<b>03</b>
	(b) Compare Pure ALOHA and Slotted ALOHA.	<b>04</b>
	(c) Differentiate between FDMA, TDMA and CDMA.	<b>07</b>
<b>Q.4</b>	(a) What is the difference between unicast, multicast and broadcast addresses?	<b>03</b>
	(b) Write down features & characteristic of ZigBee.	<b>04</b>
	(c) Discuss the fields of Ethernet frames in brief.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Give an argument why the leaky bucket algorithm should allow just one packet per tick, independent of how large the packet is.	<b>03</b>
	(b) Write down Optimality principle. Explain it with the help of an example.	<b>04</b>
	(c) Compare: Datagram and virtual circuit subnets.	<b>07</b>
<b>Q.5</b>	(a) List down drawbacks of Wi-Fi.	<b>03</b>
	(b) Explain the function of following protocol in brief: ICMP, RARP, DHCP, BOOTP	<b>04</b>
	(c) How to do congestion control in Virtual circuit subnets, explain with the help of an example?	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) What is the function of Domain name services (DNS)?	<b>03</b>
	(b) What is fire wall? Explain its working in detail.	<b>04</b>
	(c) Explain Hypertext transfer protocol (HTTP) in detail.	<b>07</b>

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3161007****Date:16-12-2022****Subject Name:Computer Networks****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

**MARKS**

<b>Q.1</b>	<b>(a)</b> Compare ISO/OSI model vs. TCP/IP model.	<b>03</b>
	<b>(b)</b> Match the following:	<b>04</b>
	1. Congestion      a. Presentation layer	
	2. Collision      b. Network layer	
	3. ISO              c. MAC sub-layer	
	4. Encryption      d. Networking Model	
	e. Organization	
	<b>(c)</b> List out and explain various network topologies.	<b>07</b>
<b>Q.2</b>	<b>(a)</b> Explain Point-to-Point and Multipoint connections / links with necessary diagrams.	<b>03</b>
	<b>(b)</b> Briefly explain types of addresses used at Host to Network Layer, IP Layer, Transport Layer and Application Layer of TCP/IP model.	<b>04</b>
	<b>(c)</b> Classify and explain Transmission Media.	<b>07</b>
	<b>OR</b>	
	<b>(c)</b> Classify and explain various Ethernet Technologies and Standards.	<b>07</b>
<b>Q.3</b>	<b>(a)</b> Explain: Hop to Hop delivery, Source to Destination delivery and Process to Process delivery	<b>03</b>
	<b>(b)</b> Compare Circuit Switching vs. Packet Switching	<b>04</b>
	<b>(c)</b> What is Sliding Window Protocol? What do you mean by ARQ? Explain Selective repeat ARQ in detail.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	<b>(a)</b> What is Framing? Explain byte stuffing technique.	<b>03</b>
	<b>(b)</b> What are Error Detection and Error Correction? Explain any one method in detail.	<b>04</b>
	<b>(c)</b> What do you mean by Collision? Classify Multiple Access Protocols. Explain CSMA/CD protocol in detail.	<b>07</b>
<b>Q.4</b>	<b>(a)</b> What do you mean by Congestion? Classify congestion control algorithms.	<b>03</b>
	<b>(b)</b> Write a short note on Bluetooth technology.	<b>04</b>
	<b>(c)</b> Explain Classful and Classless IPV4 addressing schemes with examples.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	<b>(a)</b> Draw neat sketch of connection establishment and connection termination used in TCP with necessary flags.	<b>03</b>
	<b>(b)</b> Explain Link State routing algorithm.	<b>04</b>
	<b>(c)</b> Draw and explain IPV4 datagram in detail. Also explain fragmentation.	<b>07</b>

**Q.5 (a)** Explain functioning of HTTP with supporting diagrams. **03**  
**(b)** Write a short note on Electronic Mail. **04**  
**(c)** Discuss functionality of ARP, RARP and ICMP. **07**

**OR**

**Q.5 (a)** Compare TCP vs. UDP. **03**  
**(b)** Explain functionality of Domain Name System (DNS). **04**  
**(c)** What is Cryptography? Explain Substitution and Transposition Ciphers with examples. **07**

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