

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

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

- 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**

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

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.

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

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

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

- 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**
