

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 5 – EXAMINATION – SUMMER 2026

Subject Code: 3150710

Date: 09/06/2026

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.**
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- Q.1** (a) What is client-server architecture? List its applications on the Internet. **03**
(b) Illustrate the working of the SMTP protocol with a simple example. **04**
(c) Explain the OSI model in detail and compare it with the TCP/IP model. **07**
- Q.2** (a) Define network topology. Explain star topology in detail. **03**
(b) How TCP estimates RTT (Round Trip Time)? **04**
(c) Explain the formats of HTTP request and HTTP response messages. **07**
- OR
- Q.2** (c) Explain various services provided by DNS. **07**
- Q.3** (a) Describe Hierarchical Routing. **03**
(b) Differentiate network edge and network core. **04**
(c) Explain Parity Checks and CRC with simple examples. **07**
- OR
- Q.3** (a) Describe the internal hardware structure of a router. **03**
(b) Differentiate nodal processing delay, queuing delay, transmission delay and propagation delay. **04**
(c) Explain CSMA/CD protocol. **07**
- Q.4** (a) What is fragmentation in IP? Explain briefly. **03**
(b) What is Slotted ALOHA? How it differs from Pure ALOHA? **04**
(c) Explain how TCP handles flow control and congestion control. **07**
- OR
- Q.4** (a) What is hop count? Explain its role in routing. **03**
(b) What is VLAN? Explain its advantages and working. **04**
(c) Explain the concept of multiplexing and demultiplexing by TCP in detail. **07**
- Q.5** (a) RIP is Intra-AS Routing protocol in the Internet. True or False? Justify your answer. **03**
(b) Discuss the applications of UDP. **04**
(c) Write a short note on IP addressing and forwarding. **07**

OR

- Q.5**
- (a)** In Datagram Networks, packets sent from one end system to another may follow different paths through the network and may arrive out of order. True or False? Justify your answer. **03**
 - (b)** Discuss three-way handshaking process in TCP. **04**
 - (c)** Write a short note on Broadcast and Multicast routing. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V EXAMINATION – SUMMER 2025****Subject Code:3150710****Date:17-05-2025****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) What is packet switching network? How does it differ from packet switching? | 03 |
| | (b) What is topology in compute network? Differentiate star topology from mesh topology. | 04 |
| | (c) Why OSI reference model is known as the layer architecture? What are the functions of layers of OSI reference model? | 07 |
| | | |
| Q.2 | (a) Explain IMAP Protocol for email communication. | 03 |
| | (b) What is congestion control? How does it differ from flow control? | 04 |
| | (c) Describe HTTP request and response message format in brief. | 07 |
| OR | | |
| | (c) What is DNS? How does DNS work? Explain the hierarchy of DNS servers. | 07 |
| | | |
| Q.3 | (a) What is port address in transport layer? How does it help in Process-to-process delivery at transport layer? | 03 |
| | (b) How does congestion impact network performance, and what metrics are used to detect congestion? | 04 |
| | (c) Explain the following system calls: socket(), bind(), listen(), accept(), connect(), send(), recv() ? | 07 |
| OR | | |
| Q.3 | (a) What is connection-less service? How does packet delivery connection-less services does differ from connection-oriented services? | 03 |
| | (b) Describe the process of establishing a TCP connection using the three-way handshake. | 04 |
| | (c) Explain the various fields of UDP header. What are the advantages and disadvantages of UDP over TCP? | 07 |
| | | |
| Q.4 | (a) How many maximum number of hosts can be connected in a single class B and C network? | 03 |
| | (b) Differentiate multicasting and broadcasting. | 04 |
| | (c) How routing table is built in link state routing protocol? Explain the steps in detail with figure and example. | 07 |
| OR | | |
| Q.4 | (a) How physical addresses are different from logical addresses? | 03 |
| | (b) What is subnetting? What is the subnet masks values for creating 4 and 8 subnets in class c network? | 04 |
| | (c) How the vector of distance for each router is built in distance vector routing protocol? What is count-to-infinity problem in it? | 07 |
| | | |
| Q.5 | (a) Differentiate fix size and variable size framing. | 03 |
| | (b) What is flow control? How stop-n-wait protocol does work for flow control? | 04 |

- (c) Explain selective repeat protocol with the concept of sliding window. **07**
- OR
- Q.5** (a) What is piggybacking in flow control? **03**
- (b) A bit stream 10011101 is transmitted using standard CRC Method. The divisor is 1001. Show the CRC codeword is generated at sender side. **04**
- (c) What is collision? How collision can be avoided using bit-map protocol? **07**
Explain with example.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2024

Subject Code:3150710

Date:21-05-2024

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) Define delay, loss, and throughput in the context of packet-switching networks.	03
	(b) Differentiate persistent HTTP and non-persistent HTTP.	04
	(c) Explain the functions of TCP/IP Protocol stack.	07
Q.2	(a) Explain SMTP Protocol.	03
	(b) Define following socket function call 1) Connect 2) Bind 3) Listen 4) Send	04
	(c) Explain the purpose of DNS and its role in translating domain names into IP addresses.	07
	OR	
	(c) How does recursive queries in DNS work? Explain message format of DNS.	07
Q.3	(a) What is multiplexing and demultiplexing in transport layer?	03
	(b) What are the functions of transport layer in OSI reference model? How segmentation and reassemble is performed in transport layer?	04
	(c) Differentiate Congestion Control, Flow control and Error Control.	07
	OR	
Q.3	(a) Enlist advantages of virtual circuit over datagram.	03
	(b) Explain leaky bucket protocol for congestion control.	04
	(c) Explain the various fields of TCP header What are the advantages and disadvantages of TCP.	07
Q.4	(a) What is the use of class D and Class E in IPv4 addressing?	03
	(b) Differentiate classful and classless addressing in IPv4.	04
	(c) Explain link state routing protocol.	07
	OR	
Q.4	(a) Define Unicast, multicast and broadcast.	03
	(b) Find the subnet mask value to create the following number of subnet in class A? a) 2 b) 5 c) 16 4) 63	04
	(c) Explain distance vector routing protocol.	07
Q.5	(a) Explain bit stuffing method with example.	03
	(b) What is flow control? How does stop-n-wait protocol perform flow control?	04
	(c) Explain Go-back N protocol? What is the limitation of it? How selective repeat protocol does overcome the limitation of Go back N protocol?	07

OR

- Q.5**
- | | | |
|------------|---|-----------|
| (a) | Define following types of assumptions in MAC sub layer. | 03 |
| | a) Single channel 2) N Stations 3) Collision | |
| (b) | How does two dimension parity check works for detecting error in data link layer? | 04 |
| (c) | How does pure ALOHA and slotted ALOHA protocol work? | 07 |

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- V EXAMINATION-SUMMER 2023****Subject Code: 3150710****Date: 27/06/2023****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) What is computer network? Describe the various types of network.	03
	(b) Illustrate various delays which are occurring in data packet transmission.	04
	(c) Explain different network topologies in detail.	07
Q.2	(a) What is web? Explain its architecture.	03
	(b) What is URL? What are its identifiers? Explain them.	04
	(c) List and Explain the methods of HTTP.	07
	OR	
	(c) What is HTTP? Explain Nonpersistent and Persistent connections of HTTP.	07
Q.3	(a) Define error detection and correction.	03
	(b) What is socket? Explain its importance at transport layer protocols.	04
	(c) Explain User Datagram Protocol (UDP) in detail and discuss how it differs from Transmission Control Protocol (TCP).	07
	OR	
Q.3	(a) What is the use of two dimensional parity in error detection?	03
	(b) Explain the wave length division multiplexing in detail.	04
	(c) Describe flow control and error control in TCP.	07
Q.4	(a) What is piggybacking? Explain the advantage of it.	03
	(b) Write a short note on broadcast and multicast routing.	04
	(c) Explain distance vector routing algorithm.	07
	OR	
Q.4	(a) Discuss the MAC sub layer Design issues?	03
	(b) Explain datagram networks and virtual circuit networks.	04
	(c) Explain the shortest path routing algorithm.	07
Q.5	(a) What is the minimum hamming distance?	03
	(b) What is medium access control sub layer?	04
	(c) Explain in detail ISO/OSI network model with near sketch.	07
	OR	
Q.5	(a) What is count-to-infinity problem?	03
	(b) State the difference between bit rate and baud rate.	04
	(c) Describe and discuss the data link layer design issues.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V(NEW) EXAMINATION – SUMMER 2022****Subject Code:3150710****Date:09/06/2022****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) | What is the difference between a host and an end system?
List several different types of end systems. | 03 |
| | (b) | Explain IP Address, Physical Address and Port Number in Brief. | 04 |
| | (c) | Draw the layered architecture of OSI reference model and write at least two services provided by each layer of the model. | 07 |
| Q.2 | (a) | Explain the role of Domain Name Server (DNS) in Internet? | 03 |
| | (b) | Explain functionality of Repeater, HUB, Bridge, Switch, Router and Gateway. | 04 |
| | (c) | How end-to-end congestion control is provided by TCP. | 07 |
| | | OR | |
| | (c) | Consider the 7-bit generator, G=10011, and suppose that D has the value 1010101010. What is the value of R? | 07 |
| Q.3 | (a) | Discuss parity check for error detection in data transfer. | 03 |
| | (b) | List and briefly describe three types of switching fabrics used in Routers. Which, if any, can send multiple packets across the fabric in parallel? | 04 |
| | (c) | Describe Go Back N and Selective Repeat protocol. | 07 |
| | | OR | |
| Q.3 | (a) | Give difference between connection oriented and connection less services. | 03 |
| | (b) | Why do HTTP, FTP, SMTP, and POP3 run on top of TCP rather than on UDP? Name one application that uses UDP and why? | 04 |
| | (c) | Explain RDT 2.0. | 07 |
| Q.4 | (a) | Give difference between flow control verses Congestion Control. | 03 |
| | (b) | What is HTTP? Differentiate its persistent and non-persistent types with request-response behavior of HTTP. | 04 |
| | (c) | Explain distance vector routing algorithm. | 07 |
| | | OR | |
| Q.4 | (a) | Explain CSMA/CD Protocol. | 03 |
| | (b) | Why are different inter-AS and intra-AS protocols used in the Internet? | 04 |
| | (c) | Explain Link-State routing algorithm. | 07 |

- Q.5** (a) Explain in brief socket, multiplexing and demultiplexing. **03**
(b) How DHCP protocol works? **04**
(c) Explain TCP segment structure and justify the importance of its field values. **07**
- OR**
- Q.5** (a) Describe how a botnet can be created, and how it can be used for a DDoS attack. **03**
(b) What do you mean by random access protocols? Explain slotted ALOHA in brief. **04**
(c) Explain IPv4 datagram format and importance of each field **07**