Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(NEW) EXAMINATION – WINTER 2022

Subject Code:2140709 Date:14-12-2022

Subject Name:Computer Networks

Time:10:30 AM TO 01:00 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: 1. Propagation Delay 2. Round-Trip Time 3. Transmission Delay	**03**
	(b)	Differentiate: Packet Switching and Circuit Switching.	**04**
	(c)	Draw the layered architecture of OSI reference model and discuss briefly about each layer.	**07**
Q.2	**(a)**	Differentiate SMTP, IMAP and POP3.	**03**
	(b)	Explain movement of files between local and remote system using FTP.	**04**
	(c)	What is DNS ? Explain its uses in Computer Networks.	**07**
		OR	
	(c)	What is HTTP? Differentiate its persistent and non-persistent types withrequest-response behavior of HTTP.	**07**
Q.3	**(a)**	Compare Connection Oriented and Connection-less services.	**03**
	(b)	Discuss UDP Header Format.	**04**
	(c)	How congestion can occur in the network? Give a brief on slow-startcomponent of the TCP congestion-control algorithm.	**07**
		OR	
Q.3	**(a)**	Compare TCP and UDP.	**03**
	(b)	Discuss TCP Header Format.	**04**
	(c)	Consider an instance of TCP's Additive Increase Multiplicative Decrease(AIMD) algorithm where the window size at the start of the slow start phase is 2 MSS and the threshold at the start of the first transmission is 8 MSS. Assume that a time out occurs during the fifth transmission. Find the congestion window size at the end of the 9^{th} transmission.	**07**
Q.4	**(a)**	What is Count to Infinite problem?	**03**
	(b)	If a class B network on the Internet has a subnet mask of 255.255.255.128, what is the maximum number of hosts per subnet?	**04**
	(c)	Explain IPv4 datagram format and importance of each fields.	**07**
		OR	
Q.4	**(a)**	What is Private IP address? List out the range of reserved private IP addresses of each class.	**03**
	(b)	The address of a class C host is to be split into subnets with a 4-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet?	**04**

	(c)	Explain IPv6 datagram format and importance of each fields.	**07**
Q.5	**(a)**	What is Bit stuffing, Byte stuffing and Character stuffing in Data Link Layer?	**03**
	(b)	How does Slotted ALOHA work?	**04**
	(c)	Consider a selective repeat sliding window protocol that uses a frame size of 1 KB to send data on a 1.5 Mbps link with a one-way latency of 50 msec. To achieve a link utilization of 50%, the minimum number of bits required to represent the sequence number field is _____.	**07**

OR

Q.5	**(a)**	What are the advantages of CSMA/CD?	**03**
	(b)	"The data link layer contains the header and trailer both"-Justify the statement.	**04**
	(c)	If the frame to be transmitted is 1101011011 and the CRC polynomial to be used for generating checksum is $x^4+ x + 1$, then what is the transmitted frame?	**07**

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