

**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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