U.S.N. | | | | | | | | | |
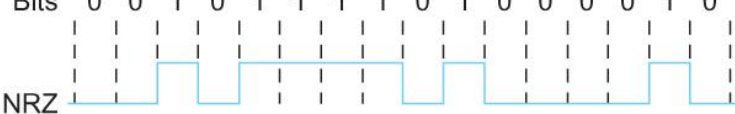
B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E.   Semester: V

Branch: Artificial Intelligence and Machine Learning   Duration: 3 hrs.

Course Code: 24AM5PCCNS   Max Marks: 100

Course: Computer Networks

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

				CO	PO	Marks
			UNIT - I			
1	a)		Signify the importance of OSI layer model in detail. Also mention the protocols employed in each layer.	CO1	PO1	**10**
	b)		Provide a socket programming solution which allows a user on one machine (client) to type in and send text to a user on another machine (server).	CO1	PO1	**10**
			OR			
2	a)		Differentiate OSI and TCP/IP network models.	CO1	PO1	**10**
	b)		Define and justify why different network performance measure are required in a computer network design. Also, calculate the propagation time if the distance between the two points is 12,000 km? Assume the propagation speed to be 2.4×10^8 m/s in cable.	CO1	PO1	**10**
			UNIT - II			
3	a)		Analyze the following series of 7x7 bit items of data that need to be transmitted from source to destination.	CO1	PO2	**10**

1	1	1	0	1	1	0	
1	1	0	1	0	1	0	
0	1	1	1	1	1	0	
0	1	1	0	1	0	0	
1	1	0	0	0	1	0	
0	0	1	0	1	0	1	
1	1	0	0	0	0	0	

Answer the following.
  i. Assuming an even parity is followed fill in the parity bit for each blank.
  ii. Will two-dimensional parity check catch all 2-bit errors.
  iii. If the first two bits of the first 2 rows are flipped (0 becomes 1 an1 becomes 0). Predict the behavior of the above technique. Can it still detect the errors in the data?

		b)	Describe 802.15.1 Standard. Also mention its applications.	*CO1*	*PO1*	**05**
		c)	Justify how a reliable transmission is achieved during data transmission in networks.	*CO1*	*PO2*	**05**
			OR			
	4	a)	Perform CRC check for the data stream 10110011 with a generator polynomial x^4+x+1.	*CO1*	*PO1*	**10**
		b)	Why does error occur during framing? Analyze the following original data and determine its validity using two-dimensional parity check. Original data 10110011 ⋮ 10101011 ⋮ 01011010 ⋮ 11010101	*CO1*	*PO2*	**05**
		c)	Analyze the following bit signal pattern and determine the type of encoding scheme used. Bits 0 0 1 0 1 1 1 0 1 0 0 0 0 1 0 NRZ	*CO1*	*PO2*	**05**
			UNIT - III			
	5	a)	A block of addresses is granted to a small organization. We know that one of the addresses is 192.12.33.35/28. What is the first address in the block? Find the last address for the block? Find the number of addresses?	*CO2*	*PO2*	**10**
		b)	Illustrate class full addressing Scheme with default subnet masks in detail.	*CO2*	*PO1*	**10**
			OR			
	6	a)	Illustrate the working principle of BGP protocol in detail.	*CO2*	*PO1*	**10**
		b)	In a network with ten hosts, the 6th host's IP address is 192.10.15.40. Identify the network id to which this host belongs to.	*CO2*	*PO2*	**10**
			UNIT - IV			
	7	a)	In what way TCP and UDP protocol differs? Justify which protocol is suitable for video streaming and file transfer applications in a network.	*CO2*	*PO2*	**10**
		b)	Describe how TCP protocol handles congestion avoidance and congestion detection problems.	*CO2*	*PO1*	**10**
			OR			
	8	a)	Provide solutions for the following i. When the re-transmission timer expires ii. Sender has not received an acknowledgment for a packet within the expected time frame.	*CO2*	*PO2*	**10**
		b)	Illustrate TCP and UDP protocol header formats in detail.	*CO2*	*PO1*	**10**

			UNIT - V			
	9	a)	Differentiate symmetric and asymmetric key exchange mechanisms. Also provide mathematical representation of the same.	*CO3*	*PO2*	**06**
		b)	Illustrate Diffie Hellman Key exchange technique with suitable example.	*CO3*	*PO1*	**08**
		c)	Using Ceaser cipher with a shift key of 3 & 5 encrypt the message "PAY MORE MONEY".	*CO3*	*PO2*	**06**
			OR			
	10	a)	Define cryptology, cryptography and cryptanalysis with an example each.	*CO3*	*PO1*	**06**
		b)	Illustrate RSA algorithm. Using RSA public key encryption technique if p=3, q=11 and d=7, and given the value of e=3, encrypt the message= 19.	*CO3*	*PO2*	**08**
		c)	Describe Session Initiation Protocol (SIP) used in various multimedia applications.	*CO3*	*PO1*	**06**

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