U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

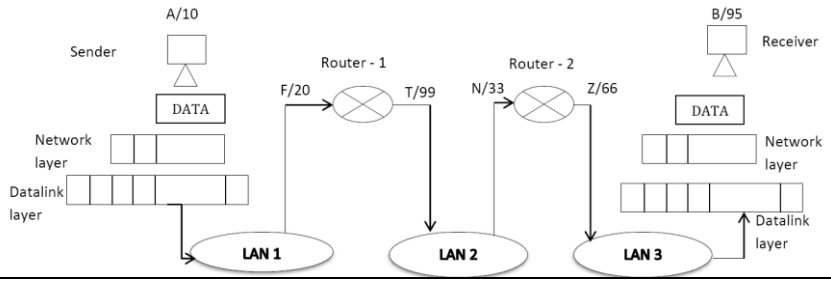
Autonomous Institute Affiliated to VTU

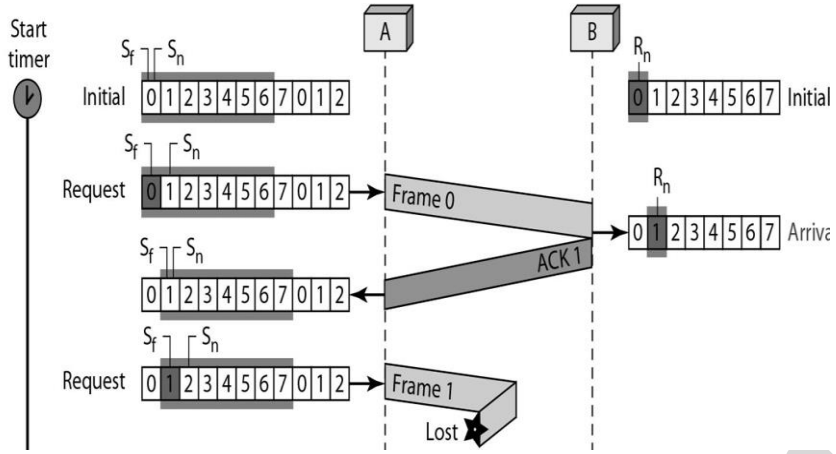
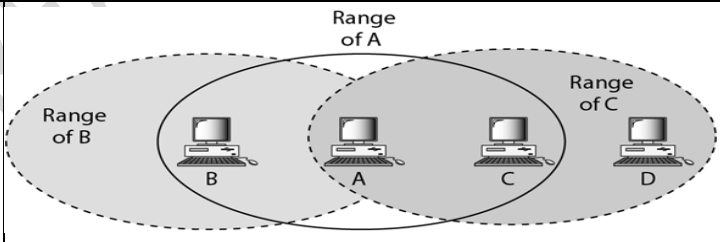
July 2024 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Electronics and Telecommunication Engineering **Duration: 3 hrs.**
Course Code: 22ET5PCCCN **Max Marks: 100**
Course: Computer Communication Networks

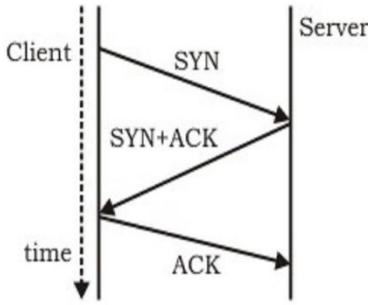
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Explain TCP/IP protocol with diagram	*CO1*		**08**
	b)		Solve the following (i)Byte stuff the date in the following figure and retrieve the data the receiver ESC | | Flag | | | ESC | ESC | | Flag | (ii)Bit stuff the date in the following information and retrieve the data the receiver 0001111111100111111010001111101111101000011111	*CO2*	*PO1*	**06**
	c)		Identify the addressing scheme for the given figure and there by i. Derive the address of network layer at sender and receiver ii. Derive the address of data link layer sender and receiver iii. Derive the address for input and output of the each router 	*CO2*	*PO2*	**06**
			UNIT - II			
2	a)		Design a bidirectional algorithm for the selective repeat protocol ARQ using piggybacking , note that the both parties need to use the same algorithm	*CO2*	*PO2*	**10**

		b)	With example prove that send window size for Go- Back – N ARQ must be less than 2^m	*CO1*		**06**
		c)	 Refer the above chart, Consider the Go Back N ARQ there by what are the next steps involved in completing transfer of frames. a) How many frames are expected to transmit b) How many ACK are received by the sender c) How many NAK are sent by receiver d) Complete the flow diagram	*CO2*	*PO2*	**04**
			OR			
	3	a)	With flow diagram explain CSMA/CD	*CO1*		**08**
		b)	Describe CSMA and show the behavior of three persistence methods of CSMA	*CO1*		**06**
		c)	A slotted ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces i). 1000 frames per second ii). 500 frames per second iii). 250 frames per second	*CO2*	*PO1*	**06**
			UNIT - III			
	4	a)	Explain backbone networks with diagram	*CO1*		**06**
		b)	 Refer above diagram and Consider the following scenarios in Case (a) and (b) there by Justify and write the time diagram for (i) (ii) Case (a) Station A is transmitting to Station B ; Station C has some data to send to station D Case (b) Station B is transmitting to Station A and Station C has some data to send to station A i) Consider Case (a) what type of problem stations are facing, if handshake frames are used does it resolve the problem	*CO2*	*PO2*	**07**

<table>
<tr><td></td><td></td><td></td><td>write timing diagram
ii) Consider Case(b) what type of problem stations are facing, solve the station problem using timing diagram</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>c)</td><td>An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows
i) The first group has 256 medium size businesses ; each needs 128 addresses
ii) The second group has 512 small businesses ; each needs 16 addresses
iii) The third group has 2048 households ; each needs 4 addresses
Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations</td><td>CO2</td><td>PO2</td><td>07</td></tr>
<tr><td></td><td></td><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>a)</td><td>Explain how NAT address translation is achieved in network layer</td><td>CO1</td><td></td><td>06</td></tr>
<tr><td></td><td>b)</td><td>List three transition strategies to move from IPV4 to IPV6. Explain the difference between each strategy during the transition period. When is each strategy used?</td><td>CO2</td><td>PO1</td><td>08</td></tr>
<tr><td></td><td>c)</td><td>Describe IP V4 datagram packet with diagram</td><td>CO2</td><td></td><td>06</td></tr>
<tr><td></td><td></td><td></td><td>UNIT - IV</td><td></td><td></td><td></td></tr>
<tr><td>6</td><td>a)</td><td>Explain closed loop congestion control with diagram</td><td>CO1</td><td></td><td>05</td></tr>
<tr><td></td><td>b)</td><td>A datagram 2000 bytes arrives to a router and this datagram must be forwarded to a link with a MTU of 576bytes. Original datagram is stamped with an identification number 444. Obtain the detail information of fragmented datagram.
(NOTE : datagram has header size included)</td><td>CO2</td><td>PO1</td><td>05</td></tr>
<tr><td></td><td>c)</td><td>Consider the following routing table at an IP router:
<table>
<tr><th>Network Address</th><th>Mask</th><th>Next Hop</th></tr>
<tr><td>128.96.170.0</td><td>255.255.254.0</td><td>Interface 0</td></tr>
<tr><td>128.96.168.0</td><td>255.255.254.0</td><td>Interface 1</td></tr>
<tr><td>128.96.166.0</td><td>255.255.254.0</td><td>R2</td></tr>
<tr><td>128.96.164.0</td><td>255.255.252.0</td><td>R3</td></tr>
<tr><td>0.0.0.0</td><td>Default</td><td>R4</td></tr>
</table>
For each IP address in Group I identify the correct choice of the next hop from Group II using the entries from the routing table above. Show calculation
<table>
<tr><th colspan="2">GROUP – I</th><th colspan="2">GROUP - II</th></tr>
<tr><td>i</td><td>128.96.171.92</td><td>a</td><td>Interface 0</td></tr>
<tr><td>ii</td><td>128.96.167.151</td><td>b</td><td>Interface 1</td></tr>
<tr><td>iii</td><td>128.96.163.151</td><td>c</td><td>R2</td></tr>
<tr><td>iv</td><td>128.96.165.121</td><td>d</td><td>R3</td></tr>
<tr><td></td><td></td><td>e</td><td>R4</td></tr>
</table></td><td>CO3</td><td>PO2</td><td>05</td></tr>
</table>

		d)	Which of the following statements are TRUE? Justify the answer (S1) Loss of SYN + ACK from the server will not establish a connection (S2) Loss of ACK from the client cannot establish the connection (S3) The server moves LISTEN → SYN_RCVD → SYN_SENT → ESTABLISHED in the state machine on no packet loss (S4) The server moves LISTEN → SYN_RCVD → ESTABLISHED in the state machine on no packet loss.  	*CO3*	*PO2*	**05**
			UNIT - V			
	7	a)	Explain different sections of DNS in internet with diagram	*CO1*		**06**
		b)	Explain different association in E mail with diagrams	*CO1*		**06**
		c)	Describe the architecture of WWW with diagram	*CO1*		**08**

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