Modified

CBCS SCHEME

USN | | | | | | | | | | |

BCS502

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Computer Networks

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	What is data communication? List and explain characteristics and components of communication model.	06	L1	CO1
	b.	Define switching. Explain Circuit Switched Network and Packet Switched Network.	06	L2	CO1
	c.	With neat sketch, explain different layers of TCP/IP protocol suite.	08	L2	CO1
		OR			
Q.2	a.	What are guided transmission media? Explain twisted pair cable in detail.	06	L1	CO1
	b.	What is Virtual Circuit Network (VCN)? With neat diagram, explain three phases involved in VCN.	08	L1	CO1
	c.	Write a note on Encapsulation and decapsulation at Source Host for TCP/IP protocol suite.	06	L2	CO1
		Module – 2			
Q.3	a.	Define Redundancy. Explain CRC encoder and CRC decoder operation with block diagram.	08	L2	CO2
	b.	Distinguish between Flow Control and Error Control. Explain Stop and Wait Protocol.	08	L2	CO2
	c.	List and explain Control Fields of I-frames, S-frames and U-frames.	04	L2	CO2
		OR			
Q.4	a.	What is Hamming distance? With example, explain Parity Check Code.	06	L1	CO2
	b.	Define Framing. Explain character oriented framing and bit-oriented framing.	06	L1	CO2
	c.	With flow diagram, explain CSMA/CA.	08	L2	CO2
		Module – 3			
Q.5	a.	Explain virtual-circuit approach to route the packets in packet-switched network.	10	L2	CO3
	b.	Illustrate the working of OSPF and BGP.	10	L3	CO3
		OR			
Q.6	a.	Explain IPv6 datagram format.	10	L2	CO3
	b.	Write an Dijikstra's algorithm to compute shortest path through graph.	06	L1	CO3
	c.	Write a note on Routing Information Protocol (RIP) algorithm.	04	L2	CO3
		Module – 4			
Q.7	a.	Explain Go-Back-N protocol working.	10	L2	CO4
	b.	With neat sketch, explain three-way handshaking of TCP connection establishment.	10	L2	CO4

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		OR			
Q.8	**a.**	With an outline, explain selective repeat protocol.	**10**	**L2**	**CO4**
	b.	List and explain various services provided by User Datagram Protocol (UDP).	**10**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Briefly explain Secure Shell (SSH).	**10**	**L2**	**CO4**
	b.	Write a note on Request message and response message formats of HTTP.	**10**	**L2**	**CO4**
		OR			
Q.10	**a.**	With neat diagram, explain the basic model of FTP.	**04**	**L2**	**CO4**
	b.	Describe the architecture of electronic mail (e-mail).	**06**	**L3**	**CO4**
	c.	Briefly explain Recursive Resolution and Iterative Resolution in DNS.	**10**	**L2**	**CO4**

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Re: Sir, Scheme Modification

"Dr.Sampath S" <23.sampath@gmail.com> January 16, 2025 10:28 AM

To: boe@vtu.ac.in

Dear Sir,

There is no change in Scheme and question paper as per the syllabus. (BCS502)

On Wed, Jan 15, 2025 at 11:55 AM <boe@vtu.ac.in> wrote:

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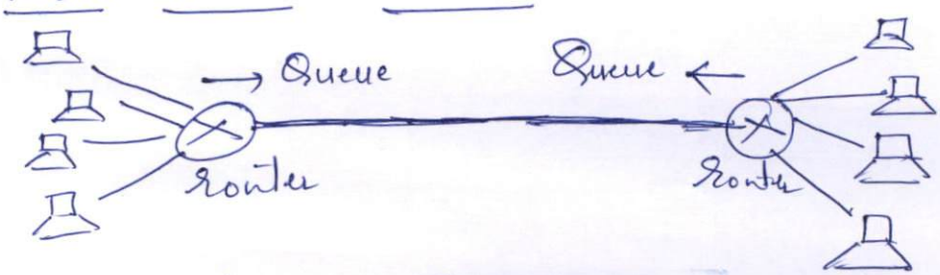
Scheme & Solutions Signature of Scrutinizer

Subject Title : Computer Networks **Subject Code :** BCS502

Question Number	Solution	Marks Allocated
1a)	Exchange of information between two devices using some form of transmission medium.	1
	Characteristics 1. Delivery 2. Accuracy 3. Timeliness 4. Jitter	2.5 with Explanation
	Components 1. Sender 2. Reciever 3. Message 4. Protocol 5. Transmission medium	2.5 with Explanation
1 b)	Switching : Proces of Connecting two links together & forwarding data from s/w to another network.	1
	Circuit Switched network 	0.5
	Explanation →	2
	Packet Switched network 	0.5
	Explanation	2

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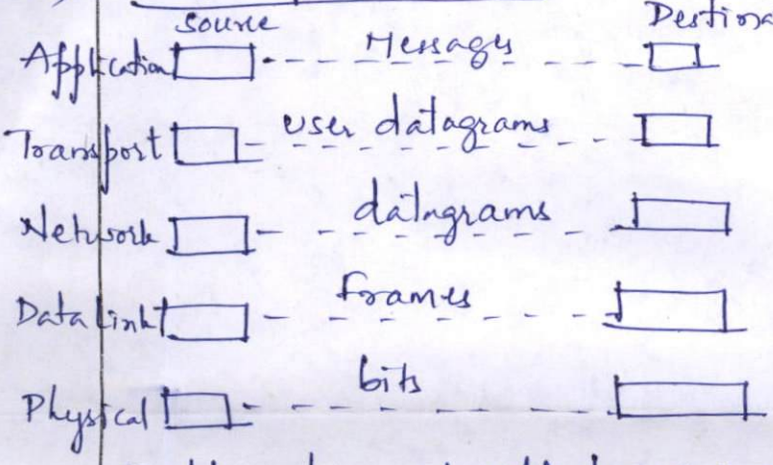
Subject Title : Computer Networks Subject Code : BCS502

Question Number	Solution	Marks Allocated
1 c)	TCP/IP protocol suite  Explanation of all Layers ⟶	2 6
2 a)	Guided media : Provides Conduit from one device to other device. Twisted pair Cable : 2 Conductors, Each with its own plastic insulation, twisted together Explanation ⟶	1 5
2 b)	VCN : Cross between Circuit Switched network and datagram network. Diagram / Figure / Block diagram Three phases : 1. Setup Request 2. Data Transfer 3. Teardown	1 1 6 with explanation
2 c)	At Source ⟶ Encapsulation At destination / Router ⟶ decapsulation & Encapsulation Encapsulation Explanation ⟶ Decapsulation Explanation ⟶	3 3

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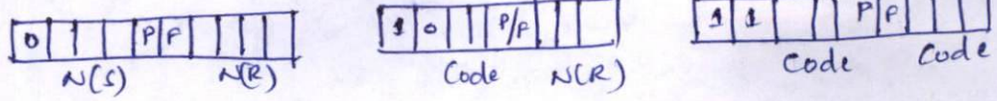
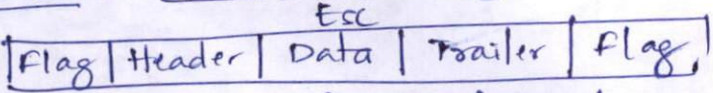
Question Number	Solution	Marks Allocated
3 a)	Redundancy: Their presence detects & Corrects the Corrupted list	2
	CRC Encoder & decoder Block diagram ⟶	1
	Generation of Codeword by Generator checked & Syndrome bits for acceptance of dataword	5
3 b)	Flow Control: mismatch between production & Consumption rates at Sender & Receiver sites Error Control: To be implemented at data-link layer to prevent recieving node from delivering Corrupted packets.	2
	Explanation of Stop & wait protocol ⟶	6
3 c)	Control fields I - frames: 0 | | | P/F | | | | — N(S) N(R) S-frames: 1 | 0 | | P/F | | | — Code N(R) U - frames: 1 | 1 | | | P/F | | | — Code Code	1M
	Explanation of each frame ⟶	1×3 = 3
4 a)	Hamming distance; It is no-of differences between Corresponding bits. $d(x,y)$	1
	Parity Check Code	
	Encoder/decoder Block diagram ⟶	1
	Generation of redundant bit $r_0 = a_3 + a_2 + a_1 + a_0$ ⟶	1
	Checking Syndrome $S_0 = b_3 + b_2 + b_1 + b_0$ ⟶	1
	Explanation ⟶	2



Subject Title : Computer Networks Subject Code : BCS502

Question Number	Solution	Marks Allocated
4 b)	framing: moving bits in the form of signal from source to destination.	
	Character-oriented framing	
		3
	Explanation of frame format ⟶	
	bit-oriented framing	
	Stuffing: 0111110 & Explanation ⟶	3
4 c)	Flow diagram of CSMA/CA ⟶	2
	Interframe space IFS ⟶	2
	Inter/Contention window ⟶	2
	Acknowledgement ⟶	2
5 a)	Virtual Circuit approach: Connection oriented service	
	Block diagram ⟶	2
	Setup phase ⟶	3
	Data Transfer Phase ⟶	3
	Teardown phase ⟶	2(2)
5 b)	OSPF: Intradomain Routing Protocol.	
	metric ⟶	1
	forwarding Tables ⟶	1
	Implementation ⟶	3
	BGP: Border Gateway Protocol	
	Operation External BGP	3
	Operation of Internal BGP	2

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Question Number	Solution	Marks Allocated
6a)	**IPV6 :** [Base header | Payload] Explanation of all fields in format Payload of IPV6 datagram	8 2
6b)	**Dijkstra** : Creates least Cost tree. Complete Algorithm ⟶	6
6c)	**RIP**; Intradomain Routing protocol. RIP Implementation ⟶ RIP Algorithm ⟶	2 2
7a)	**Go-Back-N** : Several packets are sent before receiving acknowledgements Send Window ⟶ Receive Window ⟶ FSM ⟶	4 4 2
7b)	Block diagram ⟶ 1) SYN Segment Can't carry data but Consumes one Sequence number 2) SYN + ACK 3) ACK only	2 8 with Explanation

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Question Number	Solution	Marks Allocated
8a)	Block diagram ⟶	2
	Send window Explanation ⟶	4
	Receive window Explanation ⟶	4
8b)	UDP Services	
	Process to process Communication	Each 2M×5 = 10 (Any 5)
	Connectionless Services	
	Flow Control	
	Error Control	
	Checksum	
	Congestion Control	
9a)	Components (SSH)	
	SSH Transport-Layer protocol ⟶	3
	SSH Authentication protocol ⟶	3
	SSH Connection protocol ⟶	3
	Applications of SSH ⟶	1
9b)	Request message format	
	- Request Line → method, URL version	5 with Explanation
	- Header Lines ⟶ Name value	
	- Body ⟶ Cr lf	
	- Blank line ⟶ variable	

Subject Title: Computer Networks Subject Code: BCS502

Question Number	Solution	Marks Allocated
	Response message format - status line - header lines - Blank line - Body	5 with Explanation
10a)	FTP → Client → user interface, Control, data transfer → Server → Control & data transfer process	2 2
10 b)	E-mail Architecture - User agent - MTA - MAA	Each 2M x3 = 6 with Explanation
10c)	Resolution : Mapping name to an address is Resolution.	
	Recursive Anet ISP → Root Server → Network Explanation →	1 4
	Iterative Anet ISP → Root Server → Network Explanation →	1 4

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