Semester: V	**Department of ISE & CS-AI**	**AY:** 2026-27
Course Code: BCS502	**Course Name:** Computer Networks	

Question Bank

Q.	Module-01	M	L	C
1	Define Data communication? List and explain characteristics and components of communication model.	10	L1	CO1
2	Define switching. Explain Circuit Switched Network and Packet Switched Network, Virtual Circuit Network (VCN)? With neat diagram, explain three phases involved in VCN.	10	L2	CO1
3	Write a note on Encapsulation and decapsulation at Source Host for TCP/IP protocol suite.	6	L2	CO1
4	Discuss the four basic topologies used in networks, explain their advantages and disadvantages.	6	L1	CO1
5	Explain in detail the guided and unguided Media transmission with suitable diagram.	12	L2	CO1
6	Compare and contrast various network types (e.g., LAN, MAN, WAN) with real-word examples.	10	L2	CO1
7	Explain the concept of protocol layering and discuss the advantages of using a layered approach in network models.	8	L2	CO1
8	Describe the TCP/IP protocol suite and explain the functions of each layer.	10	L2	CO1
9	Explain the OSI model and its seven layers. Compare the OSI and TCP/IP models, highlighting their similarities and differences.	10	L2	CO1
10	Discuss the characteristics of guided transmission media? Explain twisted pair, coaxial cable, and fibre optics, and compare their advantages and disadvantages.	8	L2	CO1
11	Define Topology? Explain Mesh, Star, Bus and Ring Topologies.	10	L2	CO1
	Module-02			
12	Define Redundancy. Explain CRC encoder and CRC decoder operation with block diagram	10	L2	CO2
13	Explain types of errors and Hamming distance. Find the Hamming distance between the following : i) d(000, 011) ii) d(10101, 11110)	10	L2	CO2
14	Define Framing. Explain character-oriented framing and bit -oriented framing	6	L2	CO2
15	Distinguish between Flow Control and Error Control.	6	L1	CO2
16	Explain Stop and Wait Protocol.	5	L2	CO2
17	Describe the working of CRC encoder and decoder. Perform division with respect to the following : Data word : 1001 Divisor : 1011.	12	L3	CO2
18	Generate a codeword using CRC encoder and decoder Data word= 1001 Divisor= x3 + x + 1	10	L3	CO2

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19	Write the difference between Connection-oriented Service and Connectionless -oriented service.	**8**	**L2**	**CO2**
20	Discus I- frames, S-frames, U-frames in HDLC protocol.	**10**	**L2**	**CO2**
21	Apply Checksum method for the following numbers (7,11,12,0,6).	**10**	**L3**	**CO2**
22	a program to implement a sliding window protocol in the data link layer With a neat sketch describe the working of simple protocol of Data Link Layer. Develop	**12**	**L2**	**CO2**
23	Illustrate the working of CSMA/CA with a flow diagram	**8**	**L2**	**CO2**
24	Discuss different media access control methods: random access (e.g., ALOHA, CSMA/CD) and controlled access (e.g., reservation, polling, token passing), with examples.	**12**	**L2**	**CO2**
25	Describe the Point-to-Point Protocol (PPP), its key features, and applications.	**8**	**L2**	**CO2**
26	Explain bit-oriented framing, Explain byte stuffing and unstuffing with examples.	**8**	**L2**	**CO2**
27	Describe the key Data sink Control (DLC) services: framing, flow control, and error control, and explain their purposes.	**8**	**L2**	**CO2**
28	Solve : i) In parity check if the dataword is 1011. What is the code word? What happens at receiver, if the receive word is a) 10011 b) 10110 c)01011 ii) Generate CRC for the dataword x 3 + 1 and the generator x 3 + x + 1. What happens if the received word is 1000110. iii) Generate checksum of list of five 4 -bit number (7,11,12,0,6) and verify the same at receiver.	**12**	**L3**	**CO2**
	Module-03			
29	Explain virtual -circuit approach to route the packets in packet -switched network	**10**	**L2**	**CO3**
30	Illustrate the working of OSPF and BGP	**10**	**L3**	**CO3**
31	Explain IP v6 datagram format.	**10**	**L2**	**CO3**
32	Write an Dijikstra's algorithm to compute shortest path through graph	**6**	**L1**	**CO3**
33	Write a note on Routing Information Protocol (RIP) algorithm.	**4**	**L2**	**CO3**
34	Explain the services offered by network layer.	**6**	**L2**	**CO3**
35	Define address space. Differentiate between classful addressing and class les s addressing	**8**	**L2**	**CO3**
36	Explain Network Address Resolution (NAT) with a neat diagram.	**6**	**L2**	**CO3**
37	Explain IPv6 packet format in detail.	**6**	**L2**	**CO3**
38	Discuss D -V routing highlighting the importance of distance v ector.	**7**	**L2**	**CO3**
39	Describe BGP protocol in detail	**7**	**L2**	**CO3**
40	Summarize the packet format of IPV6 datagram with suitable diagram.	**10**	**L2**	**CO3**
41	Develop an algorithm for Distance Vector Routing and explain the same.	**10**	**L2**	**CO3**
42	Explain MOSPF with an example and suitable diagram.	**10**	**L3**	**CO3**

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43	Develop algorithm for Link state Routing and explain the same.	**10**	**L2**	**CO3**
44	Describe the services provided by the network layer and its primary functions.	**7**	**L2**	**CO3**
45	Explain the concept of packet switching at the network layer. How does it differ from packet switching at the data link layer?	**8**	**L2**	**CO3**
46	Explain the structure of an IPv4 address and describe the different classes of IPv4 addresses.	**8**	**L2**	**CO3**
47	Describe the format of an IPv4 and explain the key fields and their functions	**7**	**L2**	**CO3**
48	Briefly explain the structure of an IPv6 . Compare it with IPv4 and discuss the advantages of IPv6.	**8**	**L2**	**CO3**
49	Introduce the concept of routing algorithms and differentiate between static and dynamic routing.	**7**	**L2**	**CO3**
50	Compare and contrast Distance Vector Routing (DVR), Link State Routing (LSR), and Path Vector Routing (PVR).	**8**	**L2**	**CO3**

***Note:**

1. All modules should contain a minimum of **10** questions each and the total number of questions must be **50**.
2. Questions can carry marks of 06, 07, 08, 09, 10 and for problems: 04 or 05.
3. Follow the RBTL as per the keywords used to frame the questions.
4. Maintain the Course Outcomes (COs) as per the syllabus.
5. M: Marks, L: RBTL, C:COs.

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