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Vellore Institute of Technology

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Reg. No. : 22BCE1100

Final Assessment Test (FAT) - May 2024

Programme	B.Tech.	Semester	WINTER SEMESTER 2023 - 24
Course Title	COMPUTER NETWORKS	Course Code	BCSE308L
Faculty Name	Prof. Kanchana Devi V	Slot	D1+TD1
		Class Nbr	CH2023240501837
Time	3 Hours	Max. Marks	100

General Instructions:

- Write only Register Number in the Question Paper where space is provided (right-side at the top) & do not write any other details.

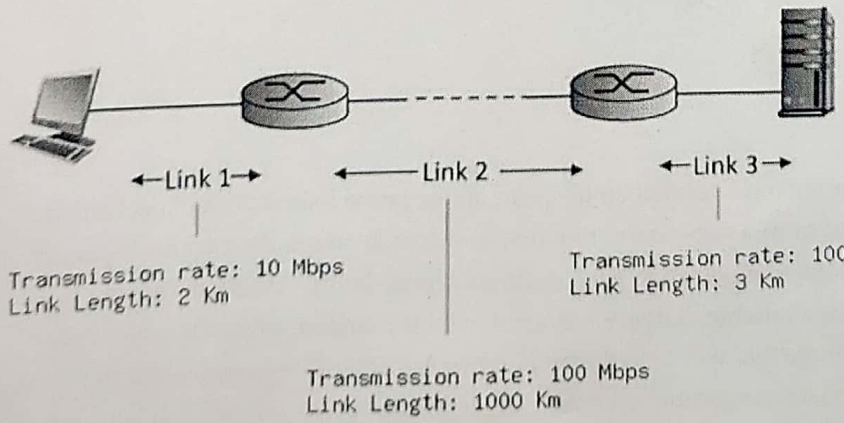
Answer all questions (10 X 10 Marks = 100 Marks)

01. i. Identify and elaborate on the term that refers to how a network is laid out physically, along with its advantages and disadvantages. **[4 Marks]** [10]

ii. Contemplate a situation in which a client computer's licensed antivirus program needs regular updates and synchronizations with signatures from the remote server. For the given scenario, illustrate the different protocols that function in each of the OSI layers. **[6 Marks]**

02. (i) Why packet switching outperforms better than circuit switching? Substantiate your answer. Also, discuss various timing delays involved in circuit switching and datagram switching. **[4 Marks]** [10]

(ii) Evaluate the end-to-end delay (including the transmission delays and propagation delays on each of the three links, but ignoring queuing delays and processing delays) from when the left host begins transmitting the first bit of a packet to the time when the last bit of that packet is received at the server at the right. The speed of light propagation delay on each link is 2.4×10^8 m/sec. Note that the transmission rates are in Mbps and the link distances are in Km. Assume a packet length of 10000 bits. Give your answer in milliseconds. **[6 Marks]**



03. Given that the data word 1010011110 is sent from a system with the generator 10111. Identify the error detection method that is applicable and show the generation of the codeword at the sender side. Analyze the codeword received. [10]

04. a. In the traditional Ethernet protocol, the frames are sent with the CRC. If the frame is corrupted, the receiving node just discards it. Is this an example of a Stop-and-wait Protocol? Justify the further processing of the frame. [5 marks] [10]

b. Assume that the sender in the stop-and-wait protocol has a single slot in which to store the frame to send or the copied frame that has been sent. Explain the same in detail by sketching what would happen if a packet were sent from the network layer to the data link layer at this precise moment. [5 marks]

05. i) Imagine multiple game stations are connected in a common medium for transferring real-time data. Identify and explain the different methods where each game stations apply the concept of sensing the medium to detect whether the channel is idle or busy with least collision compared to ALOHA. **[5 Marks]** [10]

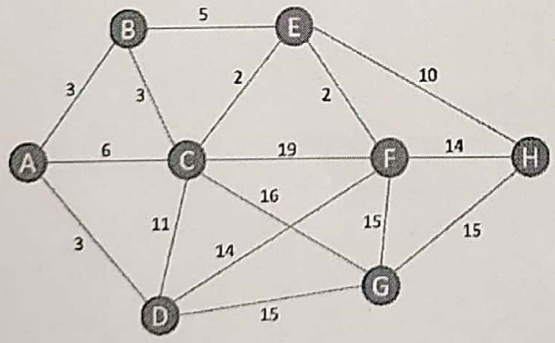
ii) Compare and contrast the above identified methods with respect to action taken while the channel is idle and busy with the diagrammatic representations. **[5 Marks]**

06. An organization is granted the block 112.0.0.0/8. The administrator wants to create 1000 subnets: [10]

(a) Find the subnet id, subnet mask and number of addresses in each subnet. [2 mark]
(b) Find the first and last allocatable addresses in first and last subnet. [4 marks]
(c) Find the first and last allocatable addresses in 42nd subnet. [4 marks]

07. Consider the below sample network. [10]

a. Construct the Link State Database at each node using link state packet information.
b. Construct the Link State Database for the whole network.
c. Construct the Least cost tree for node A by applying Dijkstra's algorithm



08. ABC bank and XYZ Prudential have teamed up to speed up the home loan delivery mechanism for its customers. Since a lot of transactions are required to be made across the various branches, the traffic between the stations is expected to peak during the peak hours. Additionally, the various stations are all under a reliable delivery service. Given the amount of traffic generated, design and describe a technique that will help the two partners in controlling congestion in the network through an appropriate congestion window, congestion policy, avoidance mechanisms and early congestion detection mechanisms. [10]

09. Assume Mr.Rex is working as a Network Administrator in Aflex Technologies at Delhi. Rex's manager asked him to give a report on performance and usage statistics of all the devices connected in the network. Illustrate about the protocol will help him to generate the specified report? Discuss the same in detail. **[10]**

10. (a) Consider a transition where the client initializes by sending a request message and the server replies by sending a response. With a proper diagram, illustrate the HTTP transaction between the client and the server. [8 marks] **[10]**

(b) Why does FTP use two well-defined ports where the other protocols in general use only one port? [2 marks]