VIT

Reg. No.

Final Assessment Test (FAT) - November/December 2023

Programme	**B.Tech.**	Semester	**FALL SEMESTER 2023 - 24**
Course Title	**COMPUTER NETWORKS**	Course Code	**BCSE308L**
Faculty Name	**Prof. Kanchana Devi V**	Slot	**C2+TC2**
		Class Nbr	**CH2023240101181**
Time	**3 Hours**	Max. Marks	**100**

Section 1 (10 X 10 Marks)
Answer all questions

01. a. Mr. Robin is a network administrator in an organization. He is assigned to design a network with eight devices to be arranged using mesh topology. Find out the number of links required to arrange the network. Also, discuss the consequences if a connection fails in this network. **[4 Marks]** [10]

b. Identify the OSI/ISO layers from the data given below and elaborate them. **[3 Marks]**

(i) The layer which converts the message into segments.

(ii) The layer which is responsible for Host – Host delivery

(iii) The layer that divides the data into frames

c. Specify the abbreviations and port numbers for the protocols provided below. **[3 Marks]**

(i) SMTP

(ii) HTTP

(iii) FTP

02. Ms. Moana is 3rd year student of VIT Chennai. She wants to have telephonic conversation with her parents residing in Mumbai. She uses a traditional telephone line to make the conversation. [10]

(i) Explain the switched network that enables this service along with delay diagram. **[3 Marks]**

(ii) Imagine a frame of size 2.5 million bytes is sent on a 1500 km link which has the bandwidth of 3 Mbps with 5 routers placed in between. The routers have 0.1 millisecond queuing time and 2 microsecond processing time. The speed of light in the link is 2×10^8 m/s. Find the Latency? Find the dominant and negligible factors of the delay. **[7 Marks]**

03. A bitstream with polynomial $x^9+x^7+x^3+x^2+1$ is transmitted using CRC method. The generator polynomial $x^5+x^4+x^2+1$. [10]

(i) Find the data transmitted? **[5 Marks]**

(ii) If the third from the last bit is inverted during the transmission, calculate the method by which the receiver detect the error. **[5 Marks]**

04. Mr. Juhan sends a message to Mr. Anub. On manipulation of external factors, the message got modified and reached Anub. As Anub is not aware of error detection and correction protocol. Suggest a suitable error detection and correction protocol and develop a manual with detailed procedure to teach him how to detect and correct error. [10]

05. _____ is based on media access protocol to sense the traffic on a channel (idle or busy) before transmitting the data. Illustrate the same with three different access modes. [10]

06. (i) Illustrate the difference between Go-back-n and Selective Repeat Protocol **[2 Marks]** [10]

(ii) For the given sequence, using sliding window flow control draw the sliding windows of size 7 between the sender A and receiver B, **[4X2=8 Marks]**

a. Frames 0, 1 and 2 are sent; frames 0 through 2 are acknowledged.

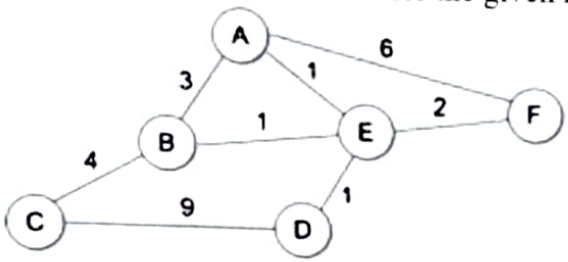
b. Frame 3 is sent; frame 3 is acknowledged.

c. Frames 4 and 5 are sent; frames 4 and 5 are acknowledged.

d. Frames 6, 7 , 0 and 1 are sent; frames 6 through 1 are acknowledged.

07. (i) Compare and contrast the fields in the main headers of IPv4 and IPv6. **[5 Marks]** **[10]**
(ii) A router receives a packet with the destination address 192.54.87.12. Show that how the router find the network address of the destination. **[5 Marks]**

08. Identify the protocol and routing in which each node shares the knowledge of its neighborhood with every other node. Use the same protocol to find the shortest routes with appropriate algorithm between all nodes for the given map. **[10]**



09. Imagine there are 100 systems in a network where every system uses TCP protocol. Due to heavy traffic, the performance of the network gets slow down. How do TCP overcome this situation to increase the performance of the network? Elaborate in detail. **[10]**

10. Mr. Scooby is interested to visit **www.xyz.com** to download some files. When he types the website name in the web browser, an IP address for the given name is retrieved from an authoritative server to facilitate the requested services. **[10]**

(i) Identify the protocol which provides the IP address for the given name. **[2 marks]**

(ii) Discuss the operations involved in the background with a neat diagram. **[8 marks]**