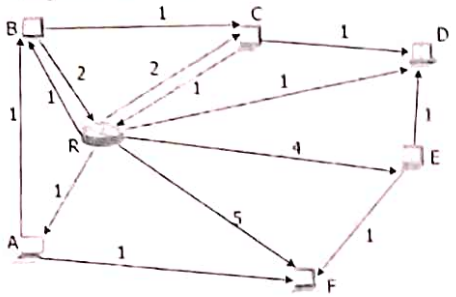
Final Assessment Test (FAT) – November/December 2022

Programme	M.Tech. (Integrated)	Semester	Fall Semester 2022-23
Course Title	COMPUTER NETWORKS ESSENTIALS	Course Code	CSE3039
Faculty Name	Prof. Amrit Pal	Slot	B1
		Class Nbr	CH2022231000998
Time	3 Hours	Max. Marks	100

Section A (10 X 10 Marks)
Answer All questions

1. Find the best routes using Distance Vector Routing Protocol with minimum cost for every node from the router for the following figure. [10]

   Explore and list all the available routes and take a decision.



2. Draw and explain the architecture of the SNMP based network monitoring and analysis in a corporate network (4Marks) [10]

   Discuss in detail three advantages of SNMP based network monitoring over other methods of monitoring for the same corporate network (6 Marks)

3. Differentiate the congestion detection and avoidance mechanisms from the military network perspective (5 Marks) [10]

   Explain the Congestion avoidance mechanism that works based on single bit individually for sender and receiver for a military network (5Marks)

4. Consider the IP 181.78.0.0 /20. Find the maximum number of subnets which could be possible for the given IP. Provide all the details for the first and last two subnets. [10]

5. Consider we need to send 30 frames from sender to receiver using star topology where the central hub is acting as the sender in a bank network. [10]

   Compare the flow control mechanisms available to ensure the integrity of the messages based on the parameters given in the table.

	Mechanism1	Mechanism2	Mechanism3	Mechanism4
Duration required to transfer 30 frames (consider the case where every frame is lost and resent)				
Possibility of errors				
Timer usage				
Number of operations				
Overall efficiency				

6. As a VIT student you use VTOP regularly, map your actions and the actions taken by the different network components with the OSI reference model. [10]

7. One student would like to transfer the video communication of 400 bps. The available bandwidth is 4 Gbps. [10]

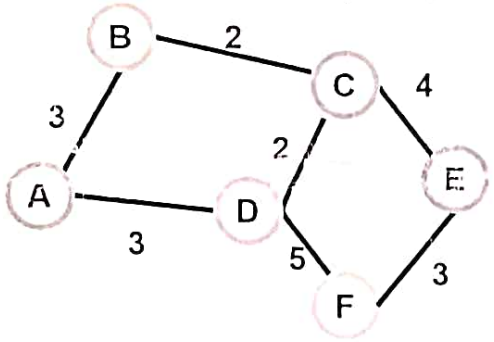
   How many students can have the parallel communication with this given bandwidth assuming that every one is using the same size of data transfer ? (3Marks)

   If the number of students is increased, getting twice, thrice and so on … , then identify the effect on the same size of data transfer/student for the same bandwidth (3 Marks)

   Plot and describe the video communication speed as a graph for the normal and increased number of students (4 Marks)

8. Consider an organization is provided with one public IP address 221.31.234.0. The system admin needs to manage a small private network of 200 systems where 60 computers are allocated for every laboratory. Elaborate a detailed plan (with example) to setup this network. How you are going to ensure that each system on the private network can communicate to a remote network's system? You must include the information about the addressing scheme while answering this question. [10]

9. Consider the given network with six nodes. The weight assigned on each edge refers to the distance between the corresponding nodes. [10]



   Distance vector routing approach is used for packet forwarding.

   Resolve the instability of the network when the node C is failed to communicate in the network? (4 Marks)

   Elaborate with proper timeline. Write the procedure/steps to resolve this type of instability in the given network (6Marks)

10. A bit stream 10011011 is transmitted along with the redundant data computed using the standard CRC method. The generator polynomial used is x3 + x +1. Compute the entire message to be transmitted by the sender. Perform the integrity check at the receiving end if the received message is 1001101101. [10]