SRM Institute of Science and Technology
College of Engineering and Technology

DEPARTMENT OF ECE

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Mode of Exam
ONLINE

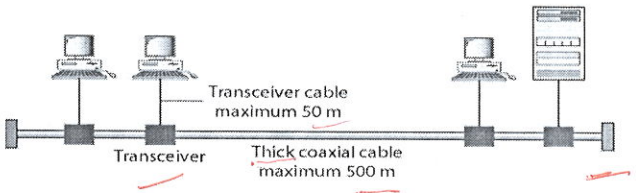
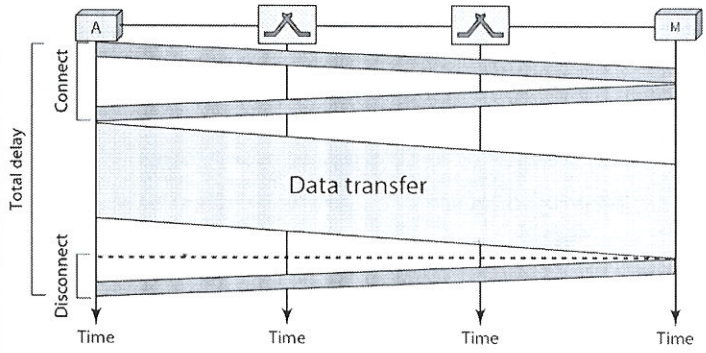
Academic Year: 2021-22 (EVEN)

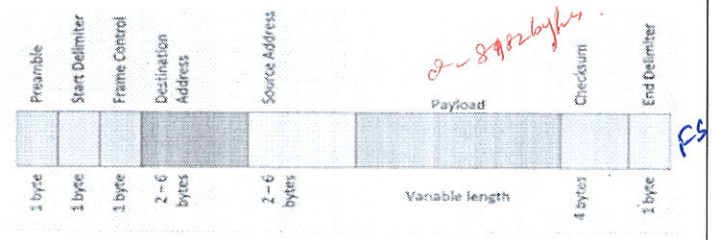
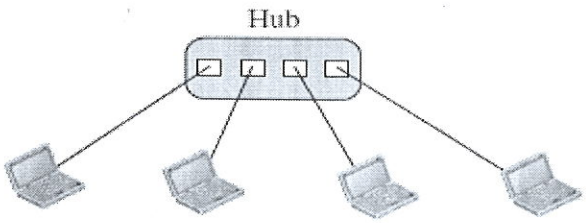
Test: CLAT-1 | **Date: 20.02.2023**
Course Code & Title:18ECC303J& COMPUTER COMMUNICATION NETWORKS | **Time: 12:30 to 1:30 PM**
Year & Sem: III & VI | **Max. Marks: 25**

Course Articulation Matrix:

CO	18ECC303J - Computer Communication Networks	Program Outcomes (POs)														
		Graduate Attributes												PSO		
	Course Outcomes (COs)	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Express the basic services and concepts related to internetworking.	-	-	-	-	-	-	3	-	-	-	-	2	-	-	-
2	Define the basic OSI model architecture and its lower layer functions.	-	-	2	-	-	-	1	-	-	-	-	-	-	-	3
3	Apply the various Network Layer concepts, mechanisms and protocols.	-	-	3	-	-	1	2	-	-	-	-	-	-	-	-
4	Analyze the services and techniques of Transport Layer.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	3
5	Produce the various services and protocols in Application Layer.	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3
6	Evaluate the various Networking concepts and Routing protocols.	-	-	-	-	1	-	-	-	-	-	-	2	-	-	3

Q. No	Part -A (5 X1 = 5 Marks) Answer all the questions	Marks	BL	CO	PO
1	c. 1500	1	1	1	7
2	b. N-1	1	2	1	7
3	d. Transport	1	1	1	7
4	c. clocking is derived from the data in synchronous	1	1	1	7
5	b. Protocol	1	1	1	7
	Part -B 2 X 4 = 8 Marks Answer any two questions				
6	Virtual Circuit Switching ▪ In Virtual circuit switching, a preplanned route is established before the messages are sent. ▪ Call request and call accept packets are used to establish the connection between sender and receiver. (2 Marks) Datagram Packet switching: • Packet is known as a datagram, is considered as an independent entity. • Each packet contains the information about the destination and switch uses this information to forward the packet to the correct destination. • The packets are reassembled at the receiving end in correct order. • The path is not fixed. Intermediate nodes take the routing decisions to forward the packets. (2 Marks)	4	2	1	7

7	**Network Layer:** **This layer is responsible for address assignment and uniquely addressing hosts in a network. Finding optimal path between two nodes.** (2 marks) **Data Link Layer:** **This layer is responsible for reading and writing data from and onto the line.** **Link errors are detected at this layer.** (2 Marks)	4	1	1	7
8	**10 Base 5 implementation:** • **First Ethernet - to use a bus topology with an external transceiver connected via a tap to a thick coaxial cable.** • **The transceiver is responsible for transmitting, receiving, and detecting collisions.** • **The transceiver is connected to the station via a transceiver cable that provides separate paths for sending and receiving** • **This means that collision can only happen in the coaxial cable.** • **The maximum length of the coaxial cable must not exceed 500 m** (3 marks)  (1 Mark)	4	2	1	7
	Part – C **1 X 12 = 12 Marks** **Answer either or questions**				
9	i.  (2 Marks) when system A needs to connect to system M, it sends a setup request that includes the address of system M, to switch I, which find the route to destination. ● *Minimal delay (coz of dedicated resources).* ● *The total delay is due to the time needed to create the connection, transfer data, and disconnection.* ❖ *The **delay caused by the setup** is the sum of propagation time of the source computer request, the request signal transfer time, the*	12	1	1	7

	propagation time of the acknowledgment from the destination computer, and the signal transfer time of the acknowledgment. ❖ *The **delay due to data transfer** is the sum of : the propagation time and data transfer time.* ❖ *The **delay due to tear down** is maximum, If the receiver requests disconnection.* (6 Marks) ii.  ✓ Preamble 1byte – Synchronization ✓ Start Delimiter 1byte – Marks the beginning of the frame ✓ Frame control 1byte – Specifies whether it is data frame or control frame ✓ Destination Address 2-6 bytes – Specifies address of the destination station ✓ Source Address 2-6 bytes – Specifies address of the source station ✓ Payload Variable length field that carries the data from the network layer ✓ Checksum 4 bytes – for error detection ✓ End Delimiter 1 byte – Marks the end of the frame (4 Marks)				
10	i. **STAR TOPOLOGY**  ➢ Each device has a dedicated point-to-point link only to a central controller, usually called a hub. ➢ The devices are not directly linked to one another. ➢ Unlike mesh, a star topology does not allow direct traffic between devices. ➢ The controller acts as an exchange. ➢ If one device wants to send data to another, it sends the data to the controller, which then relays the data to the other connected device. It is used in LANs. **Advantages :** ➢ A star topology is less expensive than a mesh topology. ➢ In a star, each device needs only one link and one I/O port to connect it to any number of others. ➢ This factor also makes it easy to install and reconfigure. ➢ Far less cabling needs to be housed, and additions, moves, and deletions involve only one connection: between that device and the hub. ➢ Star topology is also robust i.e., when one link fails, only that link is affected.	**12**	**1**	**1**	**7**

- All other links remain active.
- As long as the hub is working, it can be used to monitor link problems and bypass defective links.

Disadvantage :

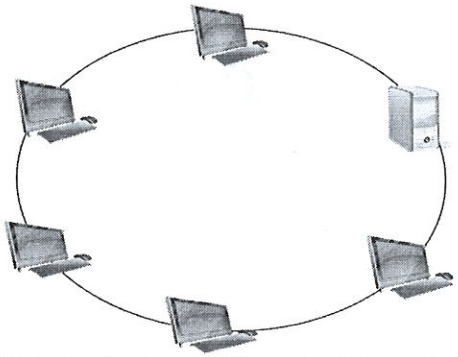
- star topology is the dependency of the whole topology on one single point, the hub.

If the hub goes down, the whole system is dead.

(4 marks)

.

RING TOPOLOGY:



- Each device has a dedicated point-to-point connection with only the two devices on either side of it.
- A signal is passed along the ring in one direction, from device to device, until it reaches its destination.
- When a device receives a signal intended for another device, its repeater regenerates the bits and passes them along

Advantages of Ring Topology

- Easy to install.
- Managing is easier as to add or remove a device from the topology only two links are required to be changed.

Disadvantages of Ring topology

- A link failure can fail the entire network as the signal will not travel forward due to failure.
- Data traffic issues, since all the data is circulating in a ring. **(4 Marks)**

ii.

Comparison- LAN & MAN

Key Parameters	LAN	MAN
Ownership	Owned by private organizations.	Ownership can be private or public.
Speed	LAN speed is quiet high.	MAN speed is average.
Delay	Network Propagation Delay is short.	Network Propagation Delay is moderate.
Congestion	LAN has low congestion as compared to WAN.	MAN has higher congestion than LAN.
Fault Tolerance	Fault Tolerance of LAN is higher than WAN.	Fault Tolerance of MAN is lower than LAN.
Maintenance	Designing and maintaining LAN is easy and less costly than WAN.	Designing and maintaining WAN is complex and more costly than LAN.

(4 Marks)

Question Paper Setter **Approved by the Course Coordinator**