SRM Institute of Science and Technology
College of Engineering and Technology

DEPARTMENT OF ECE

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Academic Year: 2022-23 (EVEN)

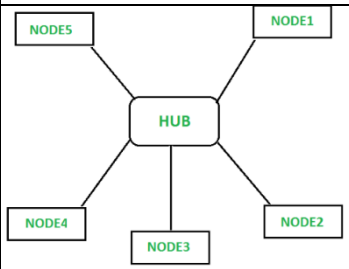
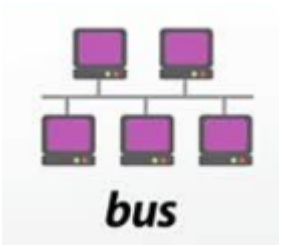
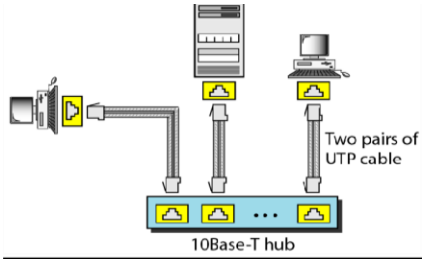
BATCH 2
SET B

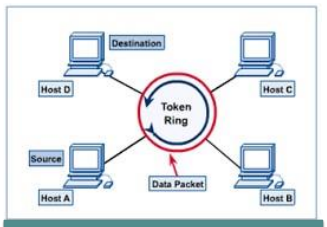
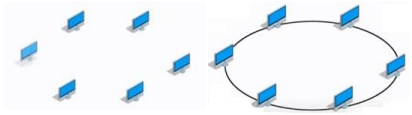
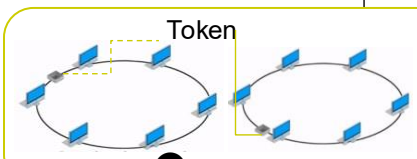
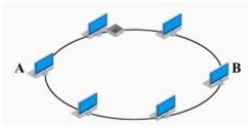
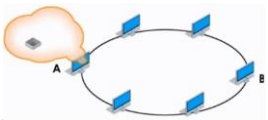
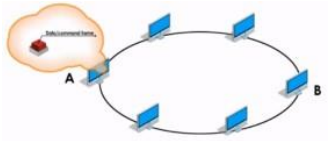
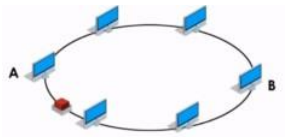
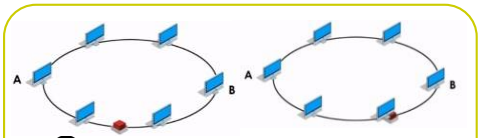
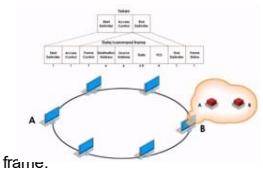
Test: CLAT-1 **Date: 20.02.2023**
Course Code & Title:18ECC303J& COMPUTER COMMUNICATION NETWORK **Duration: 1 HOUR**
Year & Sem: III & VI **Max. Marks:** 25

Course Articulation Matrix:

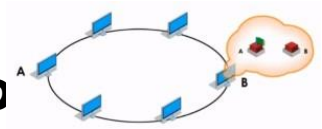
CO	18ECC303J - Computer Communication Networks	Program Outcomes (POs)														
	Course Outcomes (COs)	Graduate Attributes												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Express the basic services and concepts related to internetworking.	-	-	-	-	-	-	3	-	-	-	-	2	-	-	-
2	Define the basic OSI 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

	Part A 5 x 1 =5 marks				
Q.No	**Questions**	**Marks**	**BL**	**CO**	**PO**
1	D	**1**	**2**	**1**	**7**
2	B	**1**	**1**	**1**	**7**
3	B	**1**	**1**	**1**	**7**
4	A	**1**	**1**	**1**	**7**
5	A	**1**	**1**	**1**	**7**

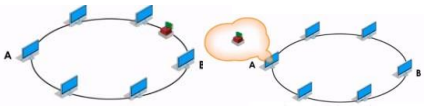
	Part B (Answer Any Two) **2 x 4= 8 marks**				
6	  STAR TOPOLOGY **CONSEQUENCE IN STAR TOPOLOGY:** The other devices will still be able to send data through the hub; there will be no access to the device which has the failed connection to the hub. **CONSEQUENCE IN BUS TOPOLOGY:** All transmission stops if the failure is in the bus. If the drop-line fails, only the corresponding device cannot operate.	**4**	**2**	**1**	**7**
7	In a circuit-switched network, end-to-end addressing is needed during the setup and teardown phase to create a connection for the whole data transfer phase. After the connection is made, the data flow travels through the already-reserved resources. The switches remain connected for the entire duration of the data transfer; there is no need for further addressing.	**4**	**1**	**1**	**7**
8	 *10Base-T uses a physical star topology. • Two pairs of twisted cable create two paths (one for sending and one for receiving) between the station and the hub. Any collision here happens in the hub. • Compared to 10Base5 or 10Base2, we can see that the hub actually replaces the coaxial cable as far as a collision is concerned. • The maximum length of the twisted cable here is defined as 100 m, to minimize the effect of attenuation in the twisted cable.	**4**	**1**	**1**	**7**
	Part B 2(Answer Any Two) **2 x 10 = 20 marks**				

9 a	SRM ## Token Ring ❖ Token Ring - IEEE 802.5 - Communication protocol in a LAN where all stations are connected in a Ring topology. ❖ Each station can directly hear transmissions only from its immediate Neighbour. ❖ Permission to transmit is granted by a message (token) that circulates around the ring. ❖ A station can send data frames only if it holds a token. ❖ The tokens are released on successful receipt of the data frame.  A token is a special frame of 3 bytes that circulates along the ring of stations TOKEN is a special bit pattern (3 bytes long). There is only one token in the network 23 ## Token Ring Working  1 Workstations connected in a ring topology  2 Token Passing  3 Suppose WS-A wants to transmit some messages to WS- B  4 WS-A catches the passing token to attach the data. Now the empty token becomes a data/control frame 24 ## Token Ring Working  5 WS-A adds the header information like frame control, destination address, source address, FCS and frame status  6 Now, token along with the message and header is released back to the ring  7 Every WS checks the destination address against their own address. Passes it on, if the address does not match  8 If Matched, WS-B copies the frame. 25	8	1	1	7

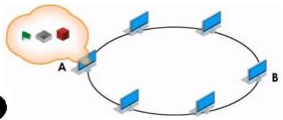
Token Ring Working



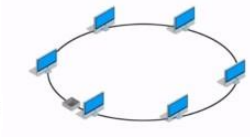
9 Changes Frame Status this provides confirmation that the message has been delivered successfully to the destination



10 Then, releases token with status back to the ring



11 When the token reaches the sender, WS removes the message from the token



12 Then, releases a new empty token back to the network

26

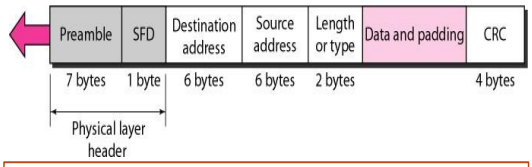
9 b

SRM

Frame Format – Standard Ethernet

Preamble: 56 bits of alternating 1s and 0s.

SFD: Start frame delimiter, flag (10101011)



Preamble.

- Contains 7 bytes (56 bits) of alternating 0s and 1s
- Alerts the receiving system to the coming frame and enables it to synchronize its input timing. The pattern provides only an alert and a timing pulse

Start Frame Delimiter (SFD).

- The second field (I byte: 10101011) signals the beginning of the fram
- Warns the station about the last chance for synchronization.
- The last 2 bits is 11 and alerts the receiver that the next field is the destination address

Destination address (DA)

- The DA field is 6 bytes
- Contains the physical address of the destination station stations to receive the packet.

Source address (SA)

- It is 6 bytes
- Contains the physical address of the sender of the pack

Length or Type.

- The original Ethernet type field to define the upper layer protocol using the MAC frame.
- The IEEE standard length field to define the number of bytes in the data field.

Data.

- Carries data encapsulated from the upper layer protocols. It is a minimum of 46 and a maximum of 1500 bytes.

CRC.

- Contains error detection information, CRC-32

9 b		4	1	1	7

10.a		**8**	**1**	**1**	**7**

- The main objective of a computer network is to be able to transfer the data from sender to receiver. This can be done by breaking it into small sub tasks, each of which are well defined.
- Each subtask will have its own process or processes to do and will take specific inputs and give specific outputs to the subtask before or after it.

(*In more technical terms we can call these sub tasks as layers*)

In general, every task or job can be done by dividing it into sub task or layers.

The OSI model has 7 layers each with its own dedicated task.. (Top to Bottom Layers)

Application Layer:

This layer is responsible for providing interface to the application user.

This layer encompasses protocols which directly interact with the user.

Presentation Layer:

This layer defines how data in the native format of remote host should be presented in the native format of host.

Session Layer: This layer maintains sessions between remote hosts.

Transport Layer: This layer is responsible for end-to-end delivery between hosts.

Network Layer:

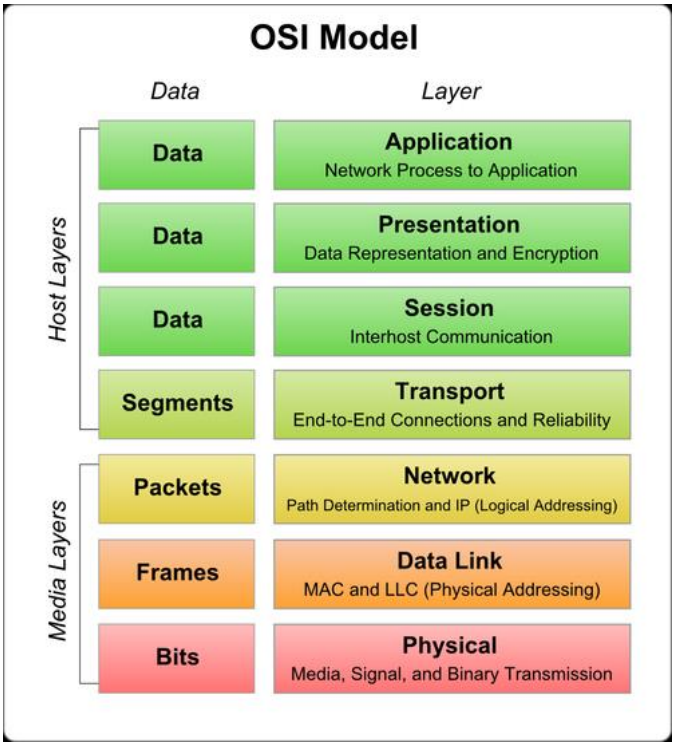
This layer is responsible for address assignment and uniquely addressing hosts in a network.

Data Link Layer:

This layer is responsible for reading and writing data from and onto the line.

Link errors are detected at this layer.

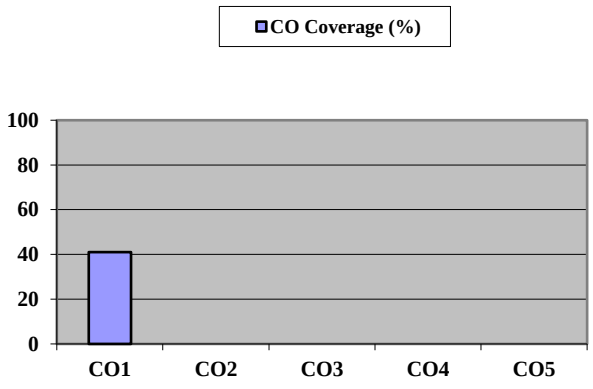
Physical Layer: This layer defines the hardware, cabling wiring, power output, pulse rate etc.

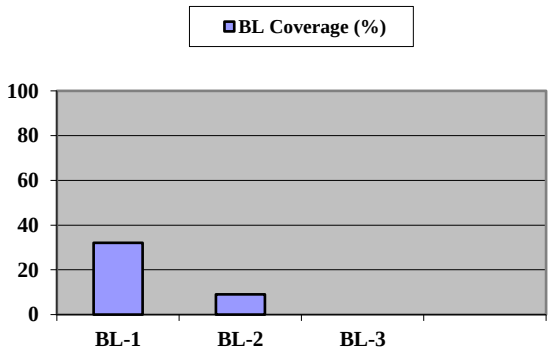


10.b			**4**	**1**	**1**	**7**

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

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions





Approved by the Course Coordinator **Signature of the Question paper setter**