SRM

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
RAMAPURAM CAMPUS
FACULTY OF ENGINEERING AND TECHNOLOGY
Department Of Computer science and Engineering
CYCLE TEST 3

Date of Exam & session	18.11.2022	Category of exam	CLA 3
Course Name	COMPUTER NETWORKS	Course Code	18CSC302J
Name of faculty	Ms. Preethy Jemima	Date of submission of answer key	08.11.2022
Department to which the faculty belong to	CSE	Total marks	50
Sub Code/Name	18CSC302J / COMPUTER NETWORKS	Set	EVEN
Year/Sem/Branch	III / V / CSE	Date	19.11.2022
Max. Marks	50	Duration	90 Mins.

PART A   (10x1= 10)
ANSWER ALL THE QUESTIONS
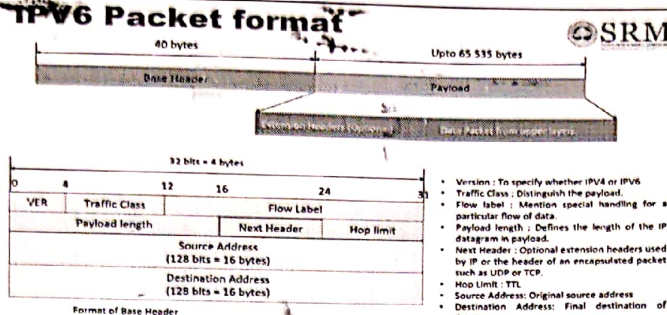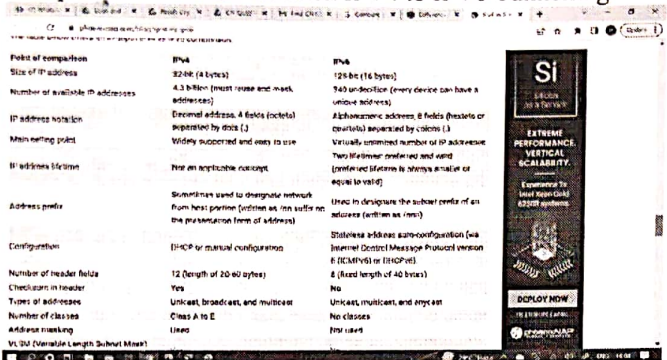
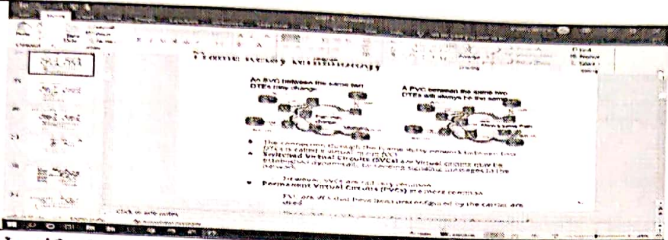| Q.No.	Questions	Marks	CO	BL	PI
1	The size of an IP address in IPv6 is _____ a) 4 bytes **b) 128 bits** c) 8 bytes d) 100 bits	1	4	1	1.6.1
2	Which among the following features is present in IPv6 but not in IPv4? a) Fragmentation b) Header checksum c) Options **d) Anycast address**	1	4	1	1.5.1
3	IPv6 supports both _____ auto configuration mode of its host devices. a) Stateful b) Stateless c) **stateful and stateless** d) No state	1	4	1	1.6.1
4	IPv6 uses _____ times more bits to address a device on the Internet. a) 3 b) 4 c) 5 d) 6	1	4	1	1.5.2
5	Which of the following transmission directions listed is not a legitimate channel? a) Simplex b) Half Duplex c) Full Duplex d) **Double Duplex**	1	4	2	1.6.1
6	Which protocol does the PPP protocol provide for handling the capabilities of the connection/link on the network? a) LCP b) NCP **c) Both LCP and NCP**	1	5	3	1.5.1

	d) TCP				
7	ATM standard defines _____ layers a) 2 b) 3 c) 4 d) 5	1	5	1	1.6.1
8	Frame Relay has error detection at the _____. a) **Data link layer** b) Network layer c) Application layer d) Transport layer	1	5	1	1.5.1
9	Which of the following statements is not applicable for cable internet access? a) It is a shared broadcast medium b) It includes HFCs c) Cable modem connects home PC to Ethernet port d) **Analog signal is converted to digital signal in DSLAM**	1	5	1	1.6.1
10	The function of DSLAM is to _____ a) **Convert analog signals into digital signals** b) Convert digital signals into analog signals c) Amplify digital signals d) De-amplify digital signals	1	5	1	1.5.1

PART B (4 X 4= 16)
ANSWER ANY **FOUR** OUT OF **SIX** QUESTIONS

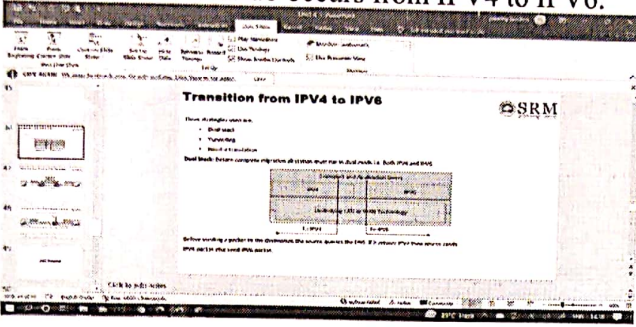| Q.No.	Question	Marks	CO	BL	PI
11	Classify the different types of Addresses of IPV6. **Ans:** IPv6 addresses are 128-bits long and are identifiers for individual interfaces and sets of interfaces. IPv6 addresses of all types are assigned to interfaces, not nodes (hosts and routers). Because each interface belongs to a single node, any of that node's interfaces' unicast addresses can be used as an identifier for the node. A single interface can be assigned multiple IPv6 addresses of any type. **(2 marks)** The three types of IPv6 addresses are: unicast, anycast, and multicast. • Unicast addresses identify a single interface. • Anycast addresses identify a set of interfaces in such a way that a packet sent to an anycast address is delivered to a member of the set. • Multicast addresses identify a group of interfaces in such a way that a packet sent to a multicast address is delivered to all of the interfaces in the group. IPv6 has no broadcast addresses: multicast addresses took over. **(2 marks)**	4	4	2	2.6.4
12	Explain about IPV6 packet format.	4	4	3	1.6.1

IPV6 Packet format ⚡ SRM
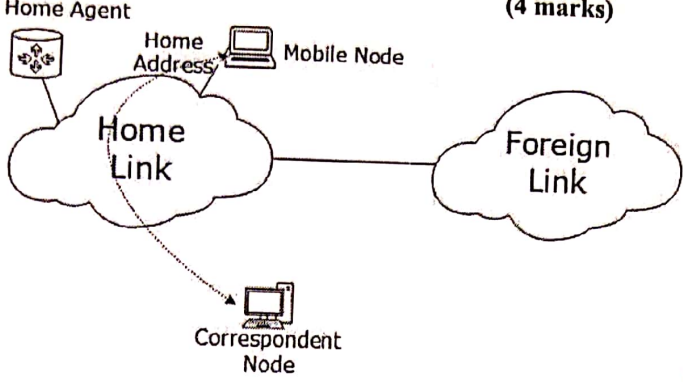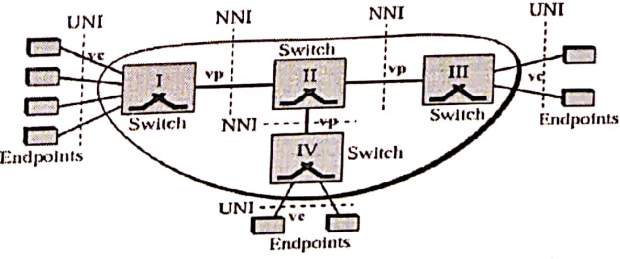

- Version : To specify whether IPV4 or IPV6
- Traffic Class : Distinguish the payload.
- Flow label : Mention special handling for a particular flow of data.
- Payload length : Defines the length of the IP datagram in payload.
- Next Header : Optional extension headers used by IP or the header of an encapsulated packet such as UDP or TCP.
- Hop Limit : TTL
- Source Address: Original source address
- Destination Address: Final destination of datagram

(Diagram – 2 marks + Explanation – 2 marks)

No.	Question				
13	Compare and contrast between IPV4 to IPV6 Tunnelling **(4 marks)**	4	4	3	4.6.1

14	Inference about the concept of Frame relaying.
	Ans:
	• **Frame Relay** is a packet-switched, connection-oriented, WAN service.
	• It operates at the data link layer of the OSI reference model.
	• Frame Relay uses a subset of the high-level data link control (HDLC) protocol called Link Access Procedure for Frame Relay (LAPF).
	• Frames carry data between user devices called data terminal equipment (DTE), and the data communications equipment (DCE) at the edge of the WAN. **(2 marks)**
	• The connection through the Frame Relay network between two DTEs is called a virtual circuit (VC).
	• **Switched Virtual Circuits (SVCs)** are Virtual circuits may be established dynamically by sending signaling messages to the network.
	    ○ However, SVCs are not very common.
	• **Permanent Virtual Circuits (PVCs)** are more common.
	    ○ PVC are VCs that have been preconfigured by the carrier are used.
	• The switching information for a VC is stored in the memory of the switch. **(2 marks)**
		4	5	2	2.6.4

|					
15	Justify the importance of other DSL Technologies. **Ans:** Uses a newer technology that used the existing telecommunications networks such as the local loop telephone line. Is an asymmetric communication technology designed for residential users; it is not suitable for business. xDSL: where x can be replaced by A, V, H, or S The existing local loops can handle bandwidths up to 1.1 MHz by removing the filter at the end of line of telephone company but, limitation because of distance between the residence and the switching office, size of cable. ADSL is adaptive technology. System uses a date rate based on the condition of the local loop line. **(2 marks)** **Other DSL Technology** **SDSL:** Symmetric Digital Subscriber Line **HDSL:** High-bit-rate digital subscriber line an alternative to the T-line (1.544 Mbps) using 2B1Q encoding up to 3.6 Km using 2 twisted-pair wires for full-duplex transmission **VDSL :** Very-high-rate digital subscriber using coaxial cable, fiber-optic, or twisted pair cable for short distances (300 to 1800 m) using DMT with a bit rate of 50 to 55 Mbps downstream and 1.5 to 2.5 Mbps upstream. **(2 marks)**	4	5	3	2.6.4
16	Summarize about PPP frame format. **Ans:** **(4 marks)** 1.Flag field. The flag field identifies the boundaries of a PPP frame. Its value is 01111110. 2. Address field. Because PPP is used for a point-to-point connection, it uses the broadcast address used in most LANs, 11111111, to avoid a data link address in the protocol. 3. Control field. The control field is assigned the value 11000000 to show that, as inmost LANs, the frame has no sequence number; each frame is independent. 4. Protocol field. The protocol field defines the type of data being carried in the datafield: user data or other information. 5. Data field. This field carries either user data or other information. 6. FCS. The frame check sequence field is simply a 2-byte or 4-byte CRC used for error detection.	4	5	1	1.6.1

Q.No.	Question	Marks	CO	BL	PI
17.a	How the transitions do occurs from IPV4 to IPV6. **(6 marks)** **(6 marks)**	12	4	2	2.6.5
	OR				
17.b	What happens in IPV6 Mobility? **Ans:** When a host is connected to a link or network, it acquires an IP address and all communication take place using that IP address on that link. As soon as, the same host changes its physical location, that is, moves into another area / subnet / network / link, its IP address changes accordingly, and all the communication taking place on the host using old IP address, goes down. **(2 marks)** **Modules Associated** • IPv6 mobility provides a mechanism for the host to roam around different links without losing any communication/connection and its IP address. • Mobile Node: The device that needs IPv6 mobility. • Home Link: This link is configured with the home subnet prefix and this is where the Mobile IPv6 device gets its Home Address. • Home Address: This is the address which the Mobile Node acquires from the Home Link. This is the permanent address of the Mobile Node. If the Mobile Node remains in the same Home Link, the communication among various entities take place as usual. • Home Agent: This is a router that acts as a registrar for Mobile Nodes. Home Agent is connected to Home Link and maintains information about all Mobile	12	4	1	1.7.1

Nodes, their Home Addresses, and their present IP addresses.

(4 marks)

(2 marks)

Mobility operations

When a Mobile Node leaves its Home Link and is connected to some Foreign Link, the Mobility feature of IPv6 comes into play. After getting connected to a Foreign Link, the Mobile Node acquires an IPv6 address from the Foreign Link. This address is called Care-of Address. The Mobile Node sends a binding request to its Home Agent with the new Care-of Address. The Home Agent binds the Mobile Node's Home Address with the Care-of Address, establishing a Tunnel between both.

Whenever a Correspondent Node tries to establish connection with the Mobile Node, the Home Agent intercepts the packet and forwards to Mobile Node's Care-of Address over the Tunnel which was already established. **(4 marks)**

18.a	Elaborate about the ATM technology in detail with a neat sketch	12	5	3	2.6.3

Ans:

- **ATM Adaptation Layer (AAL) – the protocol for packaging data into cells** is collectively referred to as AAL.
- Must efficiently package higher level data such as voice samples, video frames and datagram packets into a series of cells. **(2 marks)**

(4 marks)

- **The ATM Layer –**
    - Transmission/Swiching/Reception
    - Congestion Control/Buffer management
    - Cell header generation/removal at source/destination
    - Reset connection identifiers for the next hop (at switch)

o Cell address translation
o Sequential delivery   **(2 marks)**
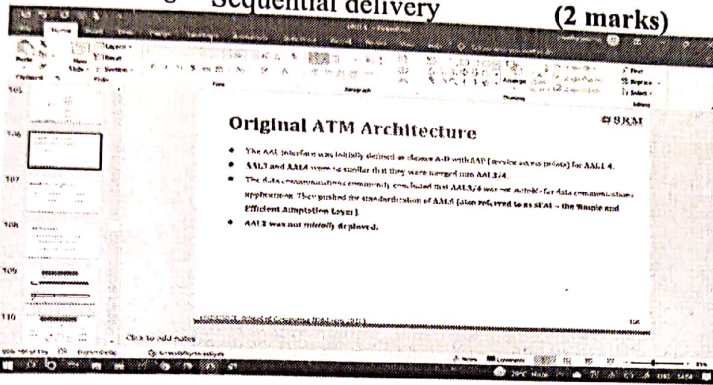
(4 marks)

<div align="center">OR</div>

18.b	**Illustrate in detail about the HDLC transfer mode and Frame structure.**	12	5	2	2.7.1

Ans:

HDLC: **(2 marks)**

- Exchange of Digital data between two devices some form of data link control
- This Protocol is important for two reasons:
  - it is a widely used standardized data link control protocol.
  - HDLC serves as a baseline from which virtually all other important data link control protocols are derived

Station types

- Primary station
  - Controls operation of link
  - Issues commands (frames)
  - Maintains separate logical link to each secondary station
- Secondary station
  - Under control of primary station
  - Issues responses (frames)
- Combined station
  - May issue commands and responses

Link Configuration   **(2 marks)**

- Unbalanced
  - One primary and one or more secondary stations
  - Supports full duplex and half duplex
- Balanced
  - Two combined stations
 - Supports full duplex and half duplex

Transfer modes: **(4 marks)**

- **Normal Response Mode (NRM)**
  - Unbalanced configuration
  - Primary can only initiate transmission
  - Secondary may only transmit data in response to command (poll) from primary
  - Used on multi-drop lines
  - Host computer as primary

- **Asynchronous Balanced Mode (ABM)**
  - Balanced configuration
  - Either station may initiate transmission without receiving permission
  - Most widely used
  - No polling overhead

Frame structure

(2 marks)

- Synchronous transmission
- All transmissions in frames
- Single frame format for all data and control exchanges
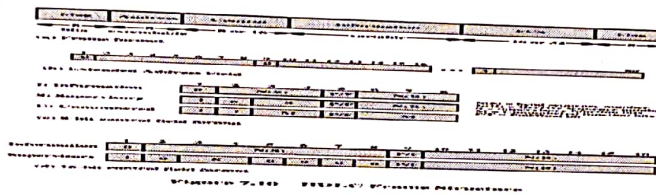
(2 marks)

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