



**[Any examinee found adopting unfair means will be expelled from the trimester/program as per UIU disciplinary rules.]**

There are 3 (Three) questions. Answer all 03 questions. All questions are of values indicated on the right-hand margin.

**Q1**

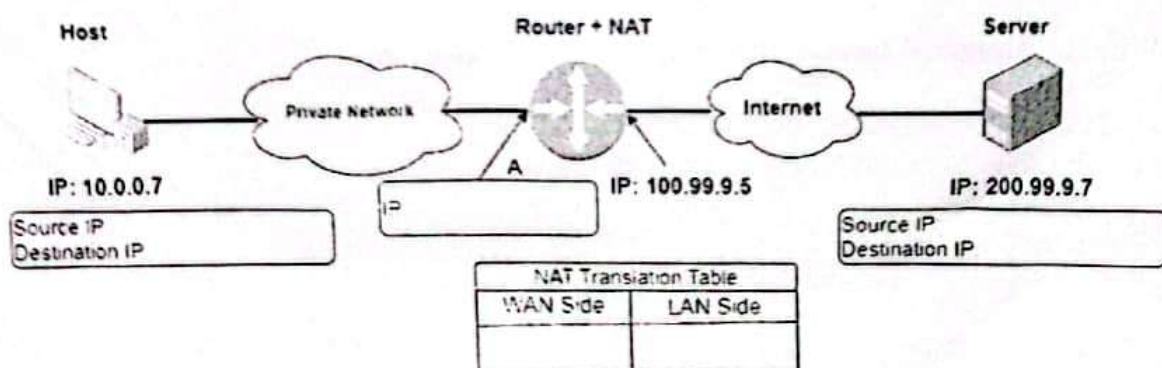
- (a) Suppose, you were chatting on Telegram. Telegram uses TCP under the hood. When you exit the app, you disconnect from Telegram server. Describe this process of Connection Release. [4]
- (b) A sender is transmitting the following message: 10011001 11100010 00100100 10000100. During transmission some error occurred and the 7<sup>th</sup> bit & 25<sup>th</sup> bit of the transmitted message got corrupted. Show the process of how this error can be detected using Checksum at both sender and receiver's end. [4]
- (c) Let the polynomial function of a message be  $M(x) = x^7 + x^6 + x^4 + x^2 + 1$  and generator polynomial, be  $G(x) = x^4 + x^3 + x^2 + 1$ . What will be the polynomial function of the final message? [4]
- (d) Suppose, Host A is sending packets to Host B using Selective Repeat protocol where window size,  $N=5$ . Now, in the middle of transmission PKT4, PKT7 and PKT9 got lost. Show the sequence diagram for the entire scenario of sender and receiver until the 10<sup>th</sup> packet is received successfully by the receiver. [4]

**Q.2**

- (a) What are the benefits of using DHCP for administering TCP/IP-based networks? For a newly arriving host, the DHCP protocol is a four-step process. What are they? [1+1=2]

- (b) Given a network diagram as shown in Fig. 1, where the Host sends datagram to the Server.

[1+1+1+1 = 4]



(Fig. 1.)

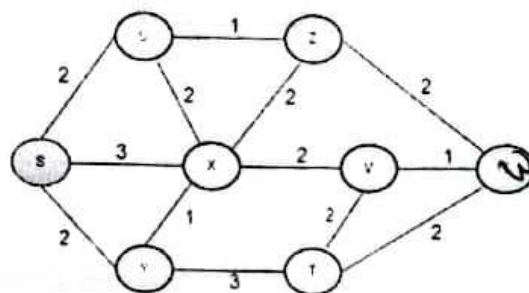


Answer the following questions:

- What are the **Source IP** and **Destination IP** of the **Host**?
- What would be the **IP address** of **interface A**?
- What would be **NAT table** when **Host** wants to communicate with the **Server**?
- What are the **Source IP** and **Destination IP** of the **Server**?

(c) Given a network diagram (Fig. 2.) as shown in graph  $G = (V, E)$ , where  $V$  is the set of routers and  $E$  is the set of links. Use **Dijkstra's link-state routing algorithm** to compute the least cost path from node **S** to all other nodes and show the least-cost-path tree from **S**.

[2 + 2 = 4]



(Fig. 2.)

(d) Suppose, the **MTU** is 660 bytes. You want to transfer the following packet.

|       |                      |          |  |  |       |
|-------|----------------------|----------|--|--|-------|
| ..... | Length=4800<br>bytes | ID = 140 |  |  | ..... |
|-------|----------------------|----------|--|--|-------|

Show the fragmentation of this packet.

[4]

(e) Write the **preferred format** of the following **IPv6** addresses.

[2]

- 10A9: 201D: 0310: 0000: 0000: 0000: 001F: 023F
- 0000: 1AF6: 2219: 0013: 0000: 0000: 1208: 0000



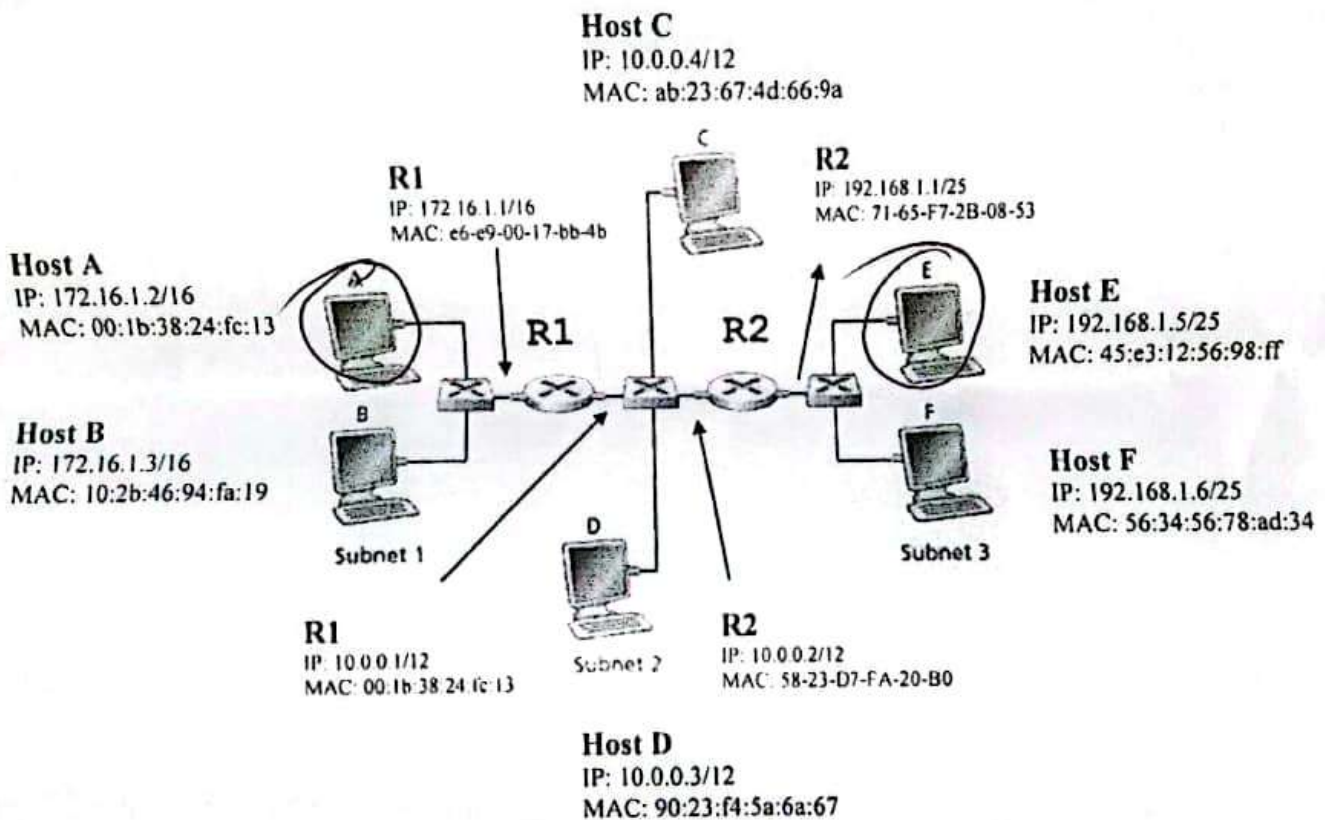
Answer the following questions:

[ 1+1+2 = 4 ]

- What is MAC address?
- Write down the format of MAC address with an example.
- Why is it necessary to have a unique MAC address for each interface in a LAN?

(b) Consider the following diagram (Fig. 4.) to answer the questions:

[ 4 ]



(Fig. 4.)

Now, PC E needs to communicate with PC A. List all the steps by PC E to send data frame to PC A.

←End of Paper - Thank You→