

**National University of Computer and Emerging Sciences,
Lahore Campus**

	Course Name:	Computer Networks	Course Code:	CS 3001
	Program:	BS (Computer Science)	Semester:	Fall 2025
	Duration:	20 minutes	Total Marks:	15
	Paper Date:	27-November-2025	Section	5A , 5C
	Exam Type:	Quiz 6 - Chapter 6	Page(s):	3

Student Name

Roll No.

Section:

Q1. Encircle the correct option: [5 marks] [CLO 1]

1. What is the purpose of ARP:
 - a) To map IP addresses to MAC addresses
 - b) To map MAC addresses to IP addresses
 - c) To map domain names to IP addresses
 - d) To map subnet masks to IP addresses
2. Pure (Un-slotted) ALOHA is:
 - a) Highly Efficient
 - b) Highly Centralized
 - c) Highly Decentralized
 - d) Fully Decentralized
3. In which network technology is CSMA/CD commonly used?
 - a) Ethernet
 - b) Wifi
 - c) Fiber Optics
 - d) Bluetooth

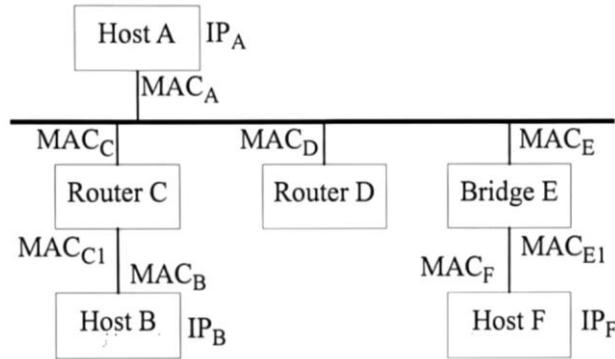
True/False:

1. In networks using CSMA/CD, there is a chance of collision. [T / F]
2. When an IP router between two Ethernet segments forwards an IP packet, it **does not** modify the destination IP address. [T / F]

Q2:

[4 Marks] [CLO 1]

In the Network shown below, forwarding tables of Routers are already populated by running a routing protocol, and forwarding table of bridge is already populated with self-learning:



- (1) Host A broadcasts an ARP Request frame to resolve the MAC Address of IP Address IP_F. Which device (host, bridge or router) will respond with an ARP reply frame?

- (2) Host B broadcasts an ARP Request frame to resolve the MAC Address of IP Address IP_F. Which device (host, bridge or router) will respond with an ARP reply frame?

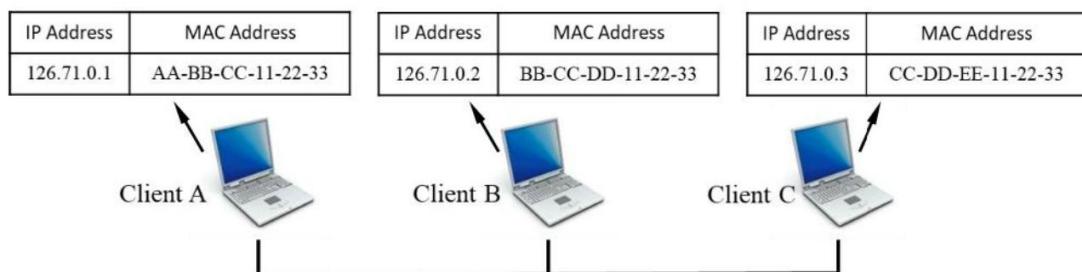
- (3) Host B wants to send an IP Packet to Host A. What are the source and destination IP Address in the packet and the source and destination MAC address in the frame?

- (4) Host A wants to send an IP Packet to Host F. What are the source and destination IP Address in the packet and source and destination MAC address in the frame?

Q3:

[1+1 = 2 Marks] [CLO 1]

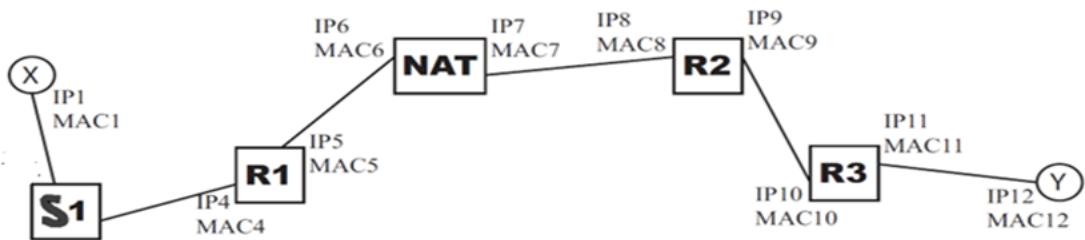
Address resolution protocol (ARP) and Network address translation (NAT) are important in the information technology field:



Suppose Client A knows that the IP Address of Client C is 126.71.0.3, but does not know the MAC Address of Client C. In this case, Client A can apply ARP to obtain the MAC Address of Client C.

- First Client A will send a Frame to ask the MAC Address of the device with IP Address 126.71.0.3. Write down the source MAC address and the destination MAC address of this Frame:
- Then Client C will send a frame to inform Client A of its MAC Address. Write down the source MAC Address and the Destination MAC Address of this frame:

Q4: A network topology is shown in the figure below. X and Y are hosts. The NAT IP6 is on the “inside” (i.e. private side) while IP7 is a global IP address. S1 is a Layer 2 switch, while R1, R2 and R3 are routers. Assume that X and Y are exchanging application layer traffic that uses TCP underneath. We are interested in source and destination IP and MAC on various packets in the network for this traffic. For packets on each of the following directional links, indicate all the four fields: **[2 + 2 = 4 Marks] [CLO 1]**



- For Packet on link from S1 to R1:

Source IP: _____
Destination IP: _____

Source MAC: _____
Destination MAC: _____

- Packet on link from NAT to R1.

Source IP: _____
Destination IP: _____

Source MAC: _____
Destination MAC: _____