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:	15 minutes	Total Marks:	15
	Paper Date:	27-November-2025	Section	5C , 5A
	Exam Type:	Quiz 6 - Chapter 6	Page(s):	3

Student Name	Roll No.	Section:

Q1. <u>Encircle the correct option:</u>   [5 marks] [CLO 1]

1. In a switch, what information does the switch table store?

    a) IP addresses of connected devices

    b) Port and corresponding MAC addresses

    c) Domain Name System (DNS) entries

    d) Switch configuration settings

2. CRC is used for:

    a) Error Detection

    b) Error Correction

    c) Both of the above

    d) None of the above

3. In ALOHA, what happens if a collision occurs?

    a) The data is retransmitted after a random time

    b) The data is discarded

    c) The sender waits for an acknowledgment

   d) The sender reduces the transmission rate
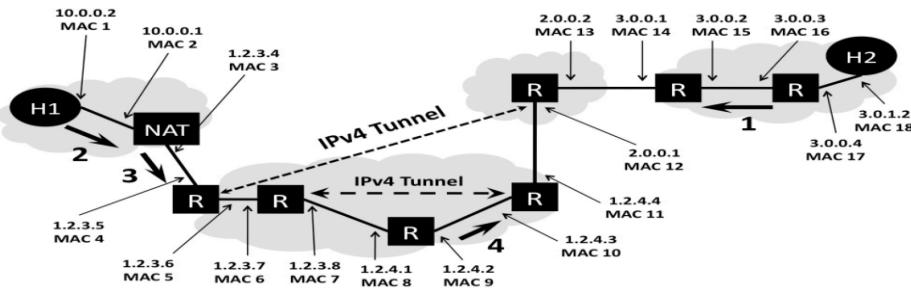
True/False:
1. Pure (Un-slotted) Aloha is highly centralized. [T / F]
2. In networks using CSMA/CD, there is a chance of collision. [T / F]

Q2:   [6 Marks] [CLO 1]

The figure below shows a network topology. The LAN on the left uses a NAT to connect to the Internet and includes a client host H1. The LAN on the right includes a webserver H2. Packets between the two endpoints are routed along the path shown by a heavy dark line, which includes two IPv4 tunnels. All packets which traverse the path use both tunnels. The various network interfaces have IP and MAC addresses as shown:

H1 has established an HTTP session with web server H2 and data packets are flowing between the two machines. You have to fill in the missing entries in the tables below, i.e. the source and destination address for the corresponding network and datalink layers for packets 2, 3, and 4 (these packets are all traveling from the client H1 to the server H2, as marked on the figure with heavy black arrows and numbers).

Packet 1

Header	Source	Destination
Ethernet	MAC 16	MAC 15
IP Address		
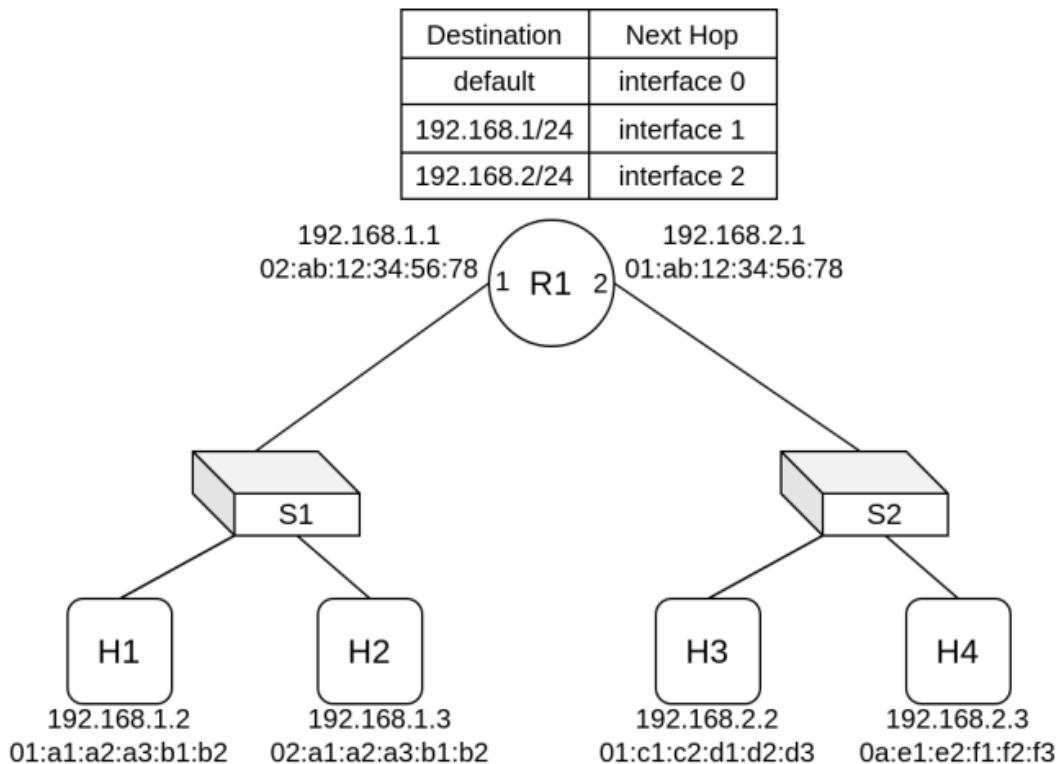
Packet 2

Header	Source	Destination
Ethernet	MAC 1	MAC 2
IP Address	10.0.0.2	3.0.1.2

Packet 3

Header	Source	Destination
Ethernet	MAC 3	MAC 4
IP Address	1.2.3.4	3.0.1.2

Packet 4

Header	Source	Destination
Ethernet	MAC 9	MAC 10
IP Address (outer/tunnel)	1.2.3.5	2.0.0.1
IP Address (inner)	1.2.3.4	3.0.1.2

Q3:

Consider the network topology shown in Figure below comprising router, switches, and hosts. The IP addresses and MAC addresses assigned to various interfaces are shown in the figure. Assume that the router's ARP table is empty: **[2 +2 = 4 Marks] [CLO 1]**

Destination	Next Hop
default	interface 0
192.168.1/24	interface 1
192.168.2/24	interface 2

192.168.1.1
02:ab:12:34:56:78 1 R1 2 01:ab:12:34:56:78
192.168.2.1

S1   S2

H1   H2   H3   H4
192.168.1.2   192.168.1.3   192.168.2.2   192.168.2.3
01:a1:a2:a3:b1:b2 02:a1:a2:a3:b1:b2 01:c1:c2:d1:d2:d3 0a:e1:e2:f1:f2:f3

Suppose that the following IP Packet's arrive at **interface 2** of Router:

Ethernet Source	Ethernet Destination	IP Source	IP Destination
0a:e1:e2:f1:f2:f3	01:ab:12:34:56:78	192.168.2.3	192.168.1.2

1. To successfully deliver the above IP Packet, the router needs to send an ARP Request. Which host(s) receive the Request?

2. Mention the following header fields for the ARP request packet sent by the router?

- **Ethernet Source:**
- **Ethernet Destination:**
- **IP Source:**
- **IP Destination:**