National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	**Computer Networks**	**Course Code:**	**CS 3001**
	Program:	**BS (Computer Science)**	**Semester:**	**Spring 2024**
	Duration:	**15 minutes**	**Total Marks:**	**15**
	Paper Date:	**02-May-2024**	**Section**	**6A**
	Exam Type:	**Quiz 6 - Chapter 6**	**Page(s):**	**3**

Student Name	**Roll No.**	**Section:**

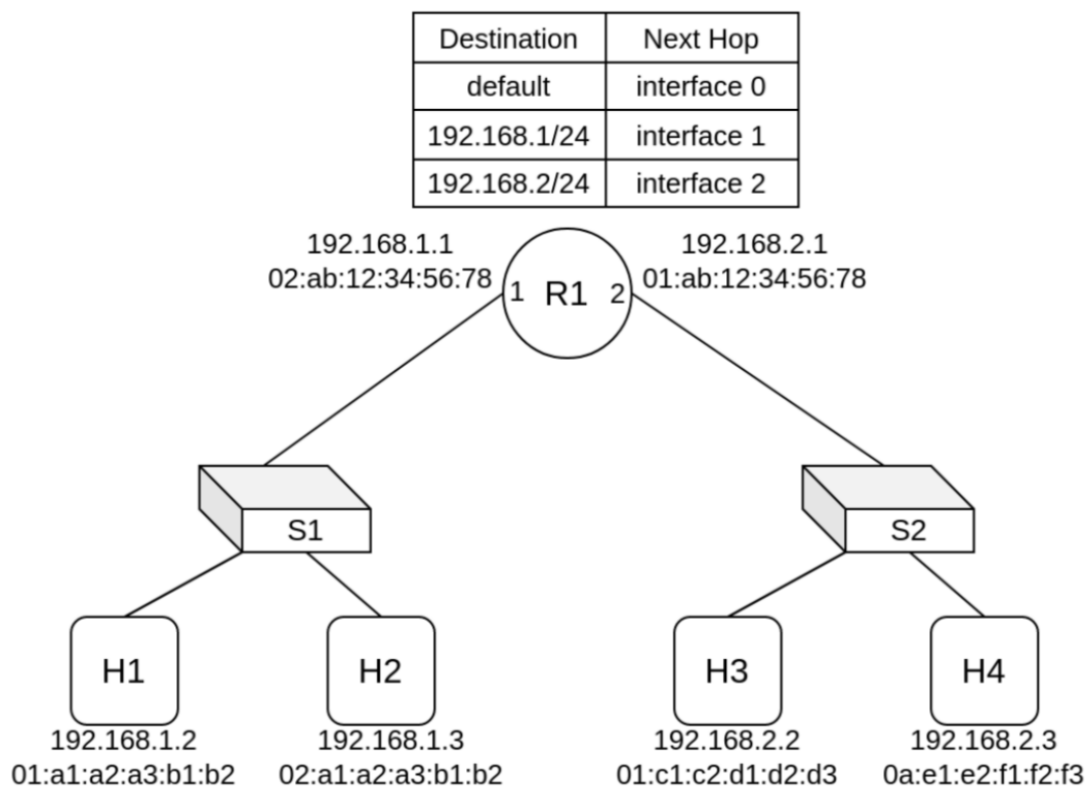## Q1. <u>Encircle the correct option:</u>   [5 marks] [CLO 3]

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) Wi-Fi
   c) Fiber optics
   d) Bluetooth

True/False:

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

Question 2:

Consider the network topology shown in Figure 1 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 at the start. **[Marks 10] [CLO 3]**

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

Figure 1: Sample Network Topology

Suppose that the following IP packet arrives 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

Router forwards the packet to interface 1.

a) To successfully deliver the above IP packet, the router needs to send an ARP request. Which host(s) receive the ARP request? (Answer in the form e.g. H8, H9)

[1 Mark]

b) Mention the following header fields for the ARP request packet sent by the router.

[4 Marks]

Ethernet Source	Ethernet Destination	IP Source	IP Destination

c) Who replies to the ARP request?

[1 Mark]

d) After the above ARP request-reply exchange, mention the following header fields for the IP packet that gets delivered to the destination host.

[4 Marks]

Ethernet Source	Ethernet Destination	IP Source	IP Destination