CSE421
Section-23

BRAC UNIVERSITY
Inspiring Excellence

Assignment 2

Submitted by

Md Enayet Ali Labib

ID: 22201676

enayet.ali.labib@g.bracu.ac.bd

Date: 7 Jan 2026

Ans to the ques no-1

I IP v4 Address = 3.12.66.26/19

∴ Network Address = 3.12.66.0/19

II

Network/link	Subnet	Usable IP
R2 LAN	/22	1022
SW LAN	/23	510
R4 LAN	/24	254
P2P Links	/30	2

III For R2 LAN,

Total IP = 1022

Total Hosts = 1000

∴ Wasted IP = 1022 − 1000 = 22 Ans

Ans to the ques no-2

I In the routing table, routes labelled 'C' are directly connected.

II R2 (config)# ip route 0.0.0.0 0.0.0.0 191.54.20.129

III R2 (config)# ip route 0.0.0.0 0.0.0.0 s0/0/1 5

IV The route is static. [40/0] means the Administrative distance is 40 and Metric is 0.

As AD is high, it is a backup route.

V Directly attached static route is better than recursive route because there is no need for an extra lookup. The interface is directly known. It has faster forwarding

Ans to the ques no-3

I Fragment size = Header + Data

∴ Data = 320 bytes

MTU = Header + Data

⇒ X = 42 + 320

∴ X = 462 B Ans

II Fragment offset of 5th Packet = 160 Ans

III Total number of fragments = 4542 ÷ 320

= 14.19

≈ 15 Ans

Ans to the ques no- 4

I R3 will learn the route after 3 iterations

II R1 detects the failure when Hello packets from R4 stop arriving and a new LSA is generated and flooded.

Ans to the ques no-5

I Expanded form:

2001:0db8:12af:0001:0000:0000:0000:0003

Type: Global Unicast.

Used for globally routable IPV6 communication on the internet.

(II) 0000:0000:0000:0000:0000:0000:0000:0000

Type: Unspecified Address.

used when a device does not yet have an IPV6 address, mainly during initialization

Ans to the ques no-6

Blocking ICMP Echo request prevents attackers from discovering live hosts using ping scan

Ans to the ques no-7

MTU discovery allows a sender to determine the maximum packet size that can be transmitted without fragmentation, improving efficiency and reliability.

Ans to the ques no-8

The client broadcasts the DHCP request to notify all servers of the selected offer, while during lease renewal the request is unicast to the original server.

Ans to the ques no-9

(I) The issue is caused by NAT on Rajib's home router, which blocks incoming connections from the internet to the locally hosted server

(II) Rajib can configure port forwarding on his router to map the game server port to the internal machine. This will allow external players to connect using his public IP

pt

Ans to the ques no-10

(I) This is called IPV6 Anycast addressing. Here multiple servers share the same IP address to provide the same service.

(II) Anycast improves performance by routing clients to the nearest server and enhances reliability by providing fail over and load distribution accross multiple servers.

Ans to the ques no-11

(I) Host x uses the ~~A~~ MAC Address of its default gateway (R1) as destination MAC. ARP is used to resolve the gateway's IP address to its MAC address before sending the frame.

Switches are called self-learning devices because they automatically learn MAC address by examining the source MAC of incoming frames and store them in their MAC table.

This is seen when S1 learns Host X's MAC on port F1.