Assignment-2 (Summer-24)
Set-A

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Section: 23

CSE-421

Ans. to the Q. No. 1

I) **255.255.128.0**

Given,

IPv4 address is 107.168.177.108

Prefix Mask is 17.

So,

Subnet mask in Binary,

1111 1111	1111 1111	1000 0000	0000 0000
255	255	128	0

In decimal,

255.255.128.0

II) **107.168.128.0 / 17**

IPVa address is 107.168.177.108

Subnet Mask is 255.255.128.0

Prefix mask is 17

So, Network address is,

107.168.128.0 / 17

III)

	Total hosts	In 2^n format	no of host bit	Subnet Generation	Network Address
LAN-A	2500+2 = 2502	4096	12	16 (3rd Octate)	107.168.128.0/20
LAN-B	1200+2 = 1202	2048	11	8 (3rd Octate)	107.168.144.0/21
LAN-C	1050+2 = 1052	2048	11	8 (3rd Octate)	107.168.152.0/21
WAN-1	2+2 = 4	4	2	4 (4th Octate)	107.168.160.0/30
WAN-2	2+2 = 4	4	2	4 (4th Octate)	107.168.160.4/30

Ans. to the Q. No. 2

I) PAT table, unique public port numbers

The ISP router uses its PAT table to map the public destination port in the reply packet to the private ip address and port

which allowes it to forward the reply to connect device.

II)

Device A and B use private addresses which are meant for internal network communication. Private addresses are not routable on the internet. The ISP router uses public IP address which is globally unique and routable. It allowes multiple private devices to access the internet using PAT.

Ans. to the Q. No. 3

I) 10

Given,

Packet Size 7240 bytes

Header Size 40 bytes

Maximum transmission per fragment 800 bytes

Packet Size without header = 7240 - 40

= 7200 bytes

Each fragment must include its own header.

So, usable data per fragment = 800 - 40

= 760

So, Number of fragments = 7200 / 760

= 9.47

≈ 10

II) 400 bytes

first 9 fragments carry full packets.

So, 9 X 760 = 6840 bytes

Remaining Packets = 7200 - 6840

= 360 bytes

So, Last fragment size is 360 + 40 (header)

= 400 bytes

III) **665**

A full fragment carries 760 bytes.

Before 8th fragment:

7 X 760 = 5320 bytes

So, Fragment offset = 532018

= 665

IV)

The MF (More fragments) bit is zero for the last fragment because it indicates no more fragments follow, signalling the receiver that this the final part of the original packet.

Ans. to the Q. No. 4

I) 2001:db8::1:0:0:100

II) ff02::1

III) 2001:0:0:3C10::

Ans. to the Q.No.5

I)

The problem is single Static route uses only one next hop. If that route fails R1 can not use other paths. For improvement back up static route should be added with higher administrative distance.

Ans. to the Q.No.6

I)

ARP Request uses brodcast. All devices

in the same brodcast domain receive it. Switch forwards ARP brodeast to all ports except the one it came from. Drop frame only if the destination is outside the brodcast domain on already seen. Routers do not forward brodcasts.

So, ARP will be received by A, B, C, D.

forwarded by S2, S1, S3

drop by R2, C, D, B

II) S2 MAC table:

A	f2	60

S3 MAC table

A	f2	60

Ans. to the Q. No 7

IH, Identifier, flags, fragment offset, Header Checksum, Options and Padding these fields added in IPV6 header that are not present in IPV4.

Ans. to the Q. No. 8

Distance Vector Routing only knows about its neighbours. Routers periodically exchange routh table with neighbours. But no single router has complete network knowledge. As router dec are made locally, this protocol is a decentrali protocol.

Differences between Distance Vector Routing and Link State Routing:

1. DVR knows only neighbours, but LSR knows entire network topology.

. DVR updates periodically, LSR updates wherever changes occur.

3. DVR is slower but LSR is faster.

Ans. to the Q. No. 9

I) DHCP Requests use brodcast to discover server. But Brodcast can't cross routers by default.
The issue is LAN2 is on a different network and no dhcp relay is configured on the router connecting LAN2 to R1.
Solution is configure dhcp relay.

R2(config)# interface (LAN2 facing interface)
R2(config-if)# ip helper-address <R1 DHPiP)

II) DHCP Request : Client to DHCP server
DHCP Pack : DHCP server to Client

Ans. to the Q. No. 10

I) AF : CC : FE

II) Mac address is considered flat because it uniquely identifies a device globally without indicating its network location.

Ans. to the Q. No. 11

Steps:

1. Check if target ip matches router interface
2. If yes, send ARP reply to requester and update ARP table.
3. If no, drop ARP Request.

Destination MAC in ARP request:

FF.FF.ff.ff.ff.ff.FF.FF