Assignment 02

EEE 465 sec 23

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SET B

Ans. to que. no. 1

a. i) Given, IP address → 109.0.8.253
devices → 2045

We know, $2^n - 2 \geq 2045$

$\Rightarrow n = \log_2 2045 + 2$

$\Rightarrow n = 11$

Here, no. of host bits, $n = 11$

So subnet mask:

network bits, $32 - 11 = \underline{21}$

subnet masks: 11111111.11111111.11111000.00000000

↳ **255.255.248.0**

network address : $256 - 248 = 8$ (3rd octet)

↳ starts at = 109.0.8.0

broadcast address: **109.0.15.255/21**

ii) $2^n - 2 = 2^{11} - 2 =$ **2046**

b.

						octet
LAN 1	500+2 = 502	512	9	23	2	3
LAN 2	255+2 = 257	512	9	23	2	3
4 routers	4+2 = 6	8	3	29	8	4
WAN	2+2 = 4	4	2	30	4	4

ans: [LAN 1 ⟶ 109.0.8.0/23 4routers → 109.0.12.0/29
LAN2 ⟶ 109.0.10.0/23 WAN → 109.0.12.8/30]

2

Ans. to que. no. 2

a) TTL keeps increasing with each packet that traceroute sends until it is sufficient. This is when the packet reaches the destination. It knows the packet has reached the destination when it sends back a ICMP Echo reply Its receipt tells traceroute when to stop.

b) i) Given data length = 900 bytes, ID = 2398, MF flag = 0
Header size - 25 bytes, length of 12 packets - 1945 bytes,
[illegible] bytes

Data per fragment, 1945 − 25 = 1920 bytes
total data = 12 × 1920 + 900 = 23940
with header, 23940 + 25 = **23965 bytes**

ii) 2nd last bytes, 23940 − 900 − 1920
= 21120
offset field = $\frac{21120}{8}$ = **2640**

iii) Last fragment will have **MF = 0**.

c. Packet size of Bracu is greater than MTU and DF bit set so fragmentation is not possible.
To solve this:
→ Reduce MTU
→ Fragmentation has to be made possible
→ Proper subnetting for 500 hosts
→ Can apply NAT.

3

Ans. to que. no. 3

a. i) Distance vector algorithm → Bellman-Ford.

ii) Using the formula : D = min (current_D , cost(N,D) + Dist(fromN)

T : 0

U : min (2) = 2

V : min (4) = 4

W = 2+3 = 5

X = 7+6 = 13

Y = min (7) = 7

Z = 7+12 = 19

table

	T	U	V	W	X	Y	Z
T →	0	2	4	5	13	7	19

b) In Link state, it is only updated where there are changes in its link states. It will not send periodic updates for changes in the routing table.

c) Distance vector sends periodic updates and converges slowly due to its count-to-infinity problem.

Ans. to que. no. 4

a) ip route 43.11.192.0 255.255.255.128 s0/1

b) ~~ip route 43.11.192.0 255.255.255.128~~

b) ip route 21.1.64.0 255.255.255.192 191.10.55.128 10

commands

static routes through multiaccess networks are different because here you have to mention 'next-hop ip address'.

c) Static routes can be identified by the letter 'S'.

show ip route : 43.11.0.0/16

or 43.11.128.0/25

4

Ans. to que. no.5

DHCPv6

a)

stateless	stateful
→ Does not track address & uses SLAAC	→ stores client information & addresses.
→ Simpler network	→ uses DHCP server
→ used in home or small LANs	→ managed network
	→ used in big enterprise networks

b) Flow table is used to identify packet flows. Its benefit is that it allows faster packet forwarding and supports QoS

c) Tunneling → where IPv6 islands separated by IPv4 infrastructure
Dual stack routers → placed at the edges/ends of tunnels.

Ans. to que. no.6

a)

MAC	IP
physical address	Logical address
It is fixed	It can be changed
Done in Layer2 (Data Link)	Done in Layer 3. (Network)

b) Host A sends ARP request to get the IPaddress of the default gateway. After getting ARP reply, Host A will → store the MAC in ARP cache, encapsulate frame and then send the frame to gateway.

c) In SW1 → receive the MAC of B on Fa0/2, flood ARP to Fa0/1
In SW2 → receive frame from SW1, Learn B's MAC on Fa0/1, floods port.

MAC TABLE:

SW1	Port	SW2	
A	known (Fa0/1)	B	Learned. (Fa0/1)
D	known (Fa0/1)		
B	Learned (Fa0/2)		