Name :

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Section :

5-A

Lab : 10

Task 1: Determine Network Address of the following IP Address.

IP address: 10.128.240.50/30. Also, determine broadcast and range of host addresses.

ANS)

IP Address: 10.128.240.50

Subnet Mask: 255.255.255.252

10.128.240.50 = 00001010.10000000.11110000.00110010

255.255.255.232 =11111111.11111111.11111111.11111100

AND = 00001010.10000000.11110000.00110000

Network Address = 10.128.240.48 (by adding 32and 16)

Broadcast = 00001010.10000000.11110000.00110011 -> **10.128.240.51**

Range = 49 – 50

Number of hosts = 4-2=2

Task 2: Determine the network and broadcast addresses and number of hosts bits and hosts for the given IPv4 addresses and prefixes in the following table.

IPv4 Address/Prefix	Network Address	Broadcast Address	Total Number of Host Bits	Total Number of Hosts
192.168.100.25/28	192.168.100.16	192.168.100.21	4	14
172.30.10.130/30	172.30.10. 128	172.30.10.3	2	2
10.1.113.75/19	10.1.113.0	10.1.113.0	13	8190
198.133.219.250/24	198.133.219.0	198.133.219.0	8	254

1) **192.168.100.25/28**

   Ip address = 11000000.10100010.01100100.00011001

   Subnetmask= 11111111.11111111.11111111.11110000

   And = 11000000.10100010.01100100.00010000

   Network Address = 192.168.100.16

Broadcast Address = 11000000.10100010.01100100.00011111

->192.168.100.21

2) 172.30.10.130/30

Ip address = 10101100.00011110.00001010.10000010

Subnetmask = 11111111.11111111.11111111.11111100

And = 10101100.00011110.00001010.10000000

Network Address = 172.30.10. 128

Broadcast Address = 10101100.00011110.00001010.10000011

➔ 172.30.10.3

3) 10.1.113.75/19

Ip address = 00001010.00000001.01110001.01001011

Subnetmask = 11111111.11111111.11100000.00000000

And = 00001010.00000001.01100000.00000000

Network Address = 10.1.113.0

Broadcast Address = 00001010.00000001.01110001.00000000

-> 10.1.113.0

4) **198.133.219.250/24**

Ip address = 11000110.10000101.11011011.11111010

Subnetmask = 11111111.11111111.11111111.00000000

And = 198.133.219.0

Network Address = 198.133.219.0

Broadcast Address = 198.133.219.0

Task 3: Network Topology A

In Part 1, you have been given the 192.168.10.0/24 network address to subnet, with the following topology. Determine the number of networks needed and then design an appropriate addressing scheme.

Step 1: Determine the number of subnets in Network Topology A.

a. How many subnets are there? ____2_____

b. How many bits should you borrow to create the required number of subnets? ___1_____

c. How many usable host addresses per subnet are in this addressing scheme? ____126_____

d. What is the new subnet mask in dotted decimal format? _____255.255.255.128_____

e. How many subnets are available for future use? _____0_____

Step 2: Record the subnet information.

Fill in the following table with the subnet information:

Subnet Number	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
0	192.168.10.0	192.168.10.1	192.168.10.126	192.168.10.127
1	192.168.10.128	192.168.10.129	192.168.10.254	192.168.10.255

Task 4: Network Topology B

The topology has changed again with a new LAN added to R2 and a redundant link between R1 and R3. Use the 192.168.10.0/24 network address to provide addresses to the network devices. Also provide an IP address scheme that will accommodate these additional devices. For this topology, assign a subnet to each network.

Step 1: Determine the number of subnets in Network Topology B.

a. How many subnets are there? _____4____

b. How many bits should you borrow to create the required number of subnets? ____2_____

c. How many usable host addresses per subnet are in this addressing scheme? _____62_____

d. What is the new subnet mask in dotted decimal format? _____255.255.255.192_____

e. How many subnets are available for future use? _____0_____

Step 2: Record the subnet information.

Fill in the following table with the subnet information:

Subnet Number	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address

0	192.168.10.0	192.168.10.1	192.168.10.62	192.168.10.63
1	192.168.10.64	192.168.10.65	192.168.10.126	192.168.10.127
2	192.168.10.128	192.168.10.129	192.168.10.190	192.168.10.191
3	192.168.10.192	192.168.10.193	192.168.10.254	192.168.10.255