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**Section: BCS-5B**

**Course Name: Computer Networks LAB**

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## TASK 1:

IP address: 10.128.240.50/30

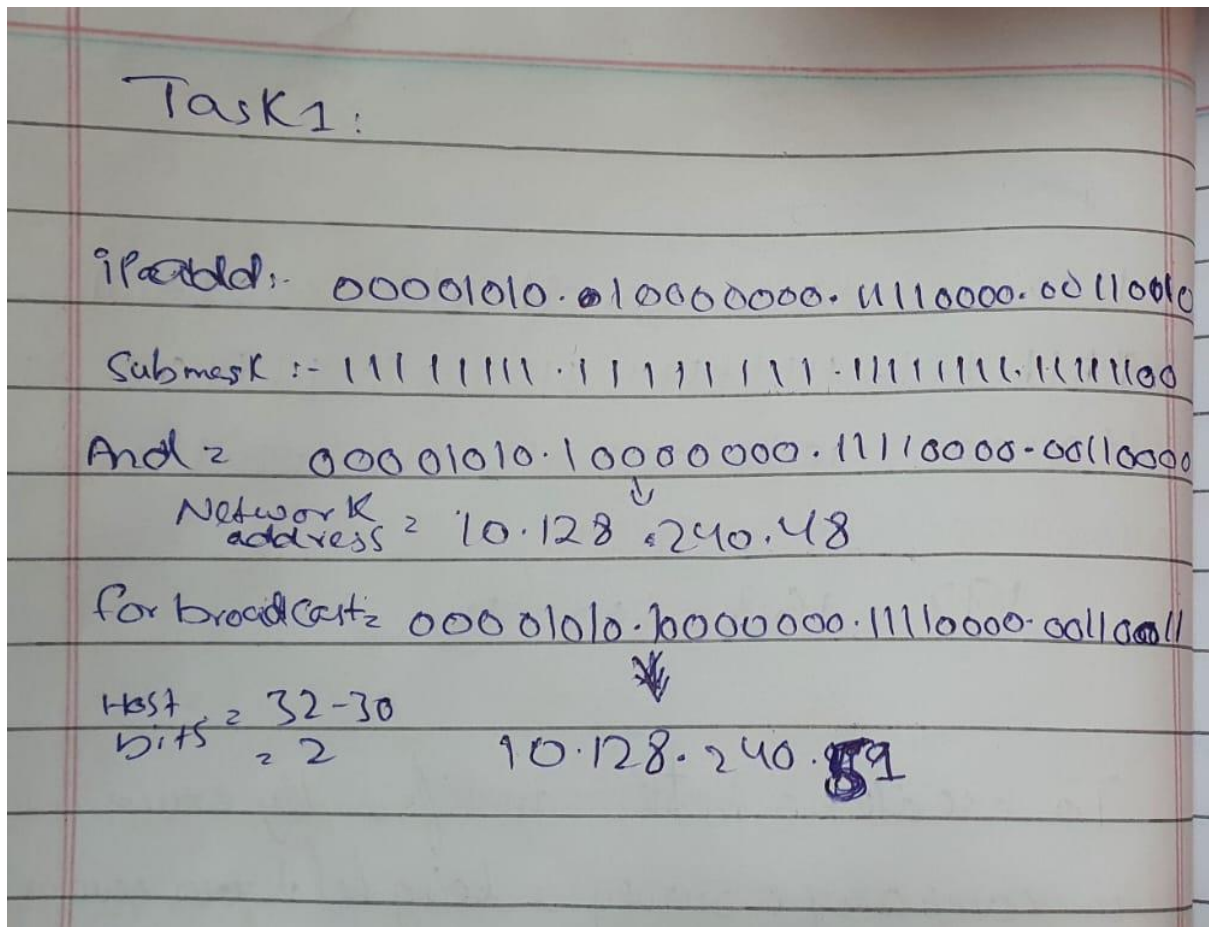
Subnet mask: 255.255.255.252

So

Network address is: 10.128.240.48

Broadcast: 10.128.240.51

Range: 10.128.240.49 – 10.128.240.50



## TASK 2:

a)

IPv4 Address/Prefix: 192.168.100.25/28

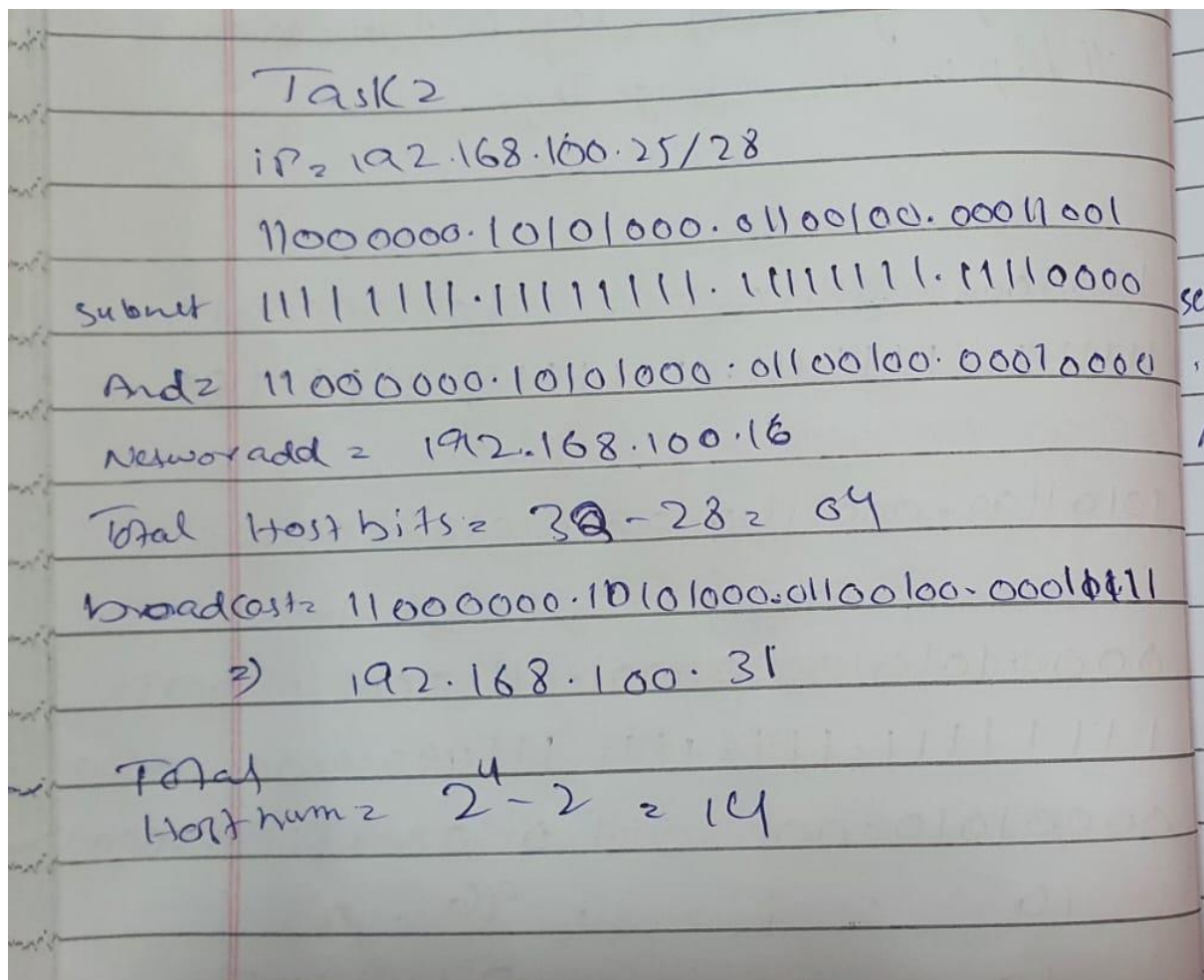
Network Address: 192.168.100.16

Broadcast Address: 192.168.100.31

Total Number of Host Bits: 04

Total Number of Hosts: 14

### Calculations:



b)

IPv4 Address/Prefix: 172.30.10.130/30

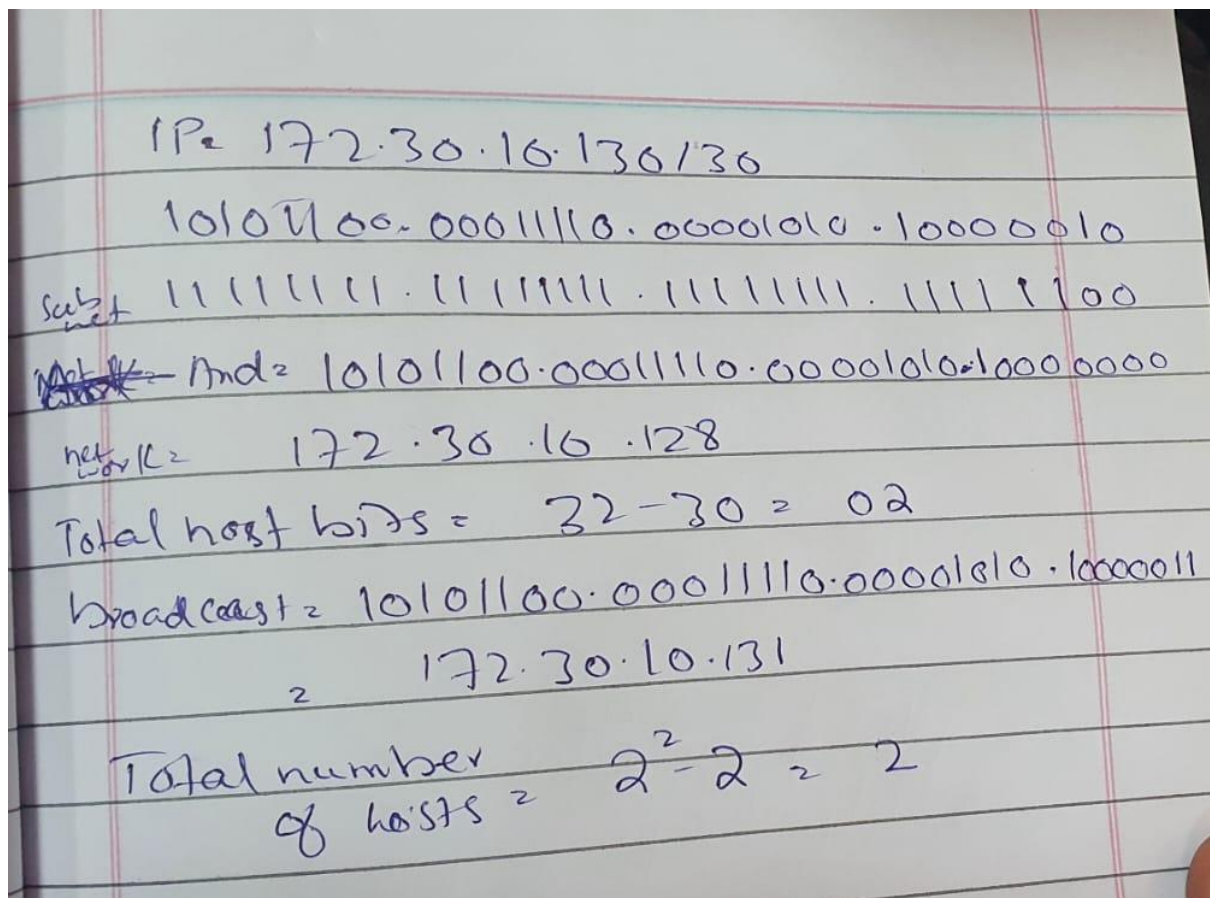
Network Address: 172.30.10.128

Broadcast Address: 172.30.10.131

Total Number of Host Bits: 02

Total Number of Hosts: 02

### Calculations:



c)

IPv4 Address/Prefix: 10.1.113.75/19

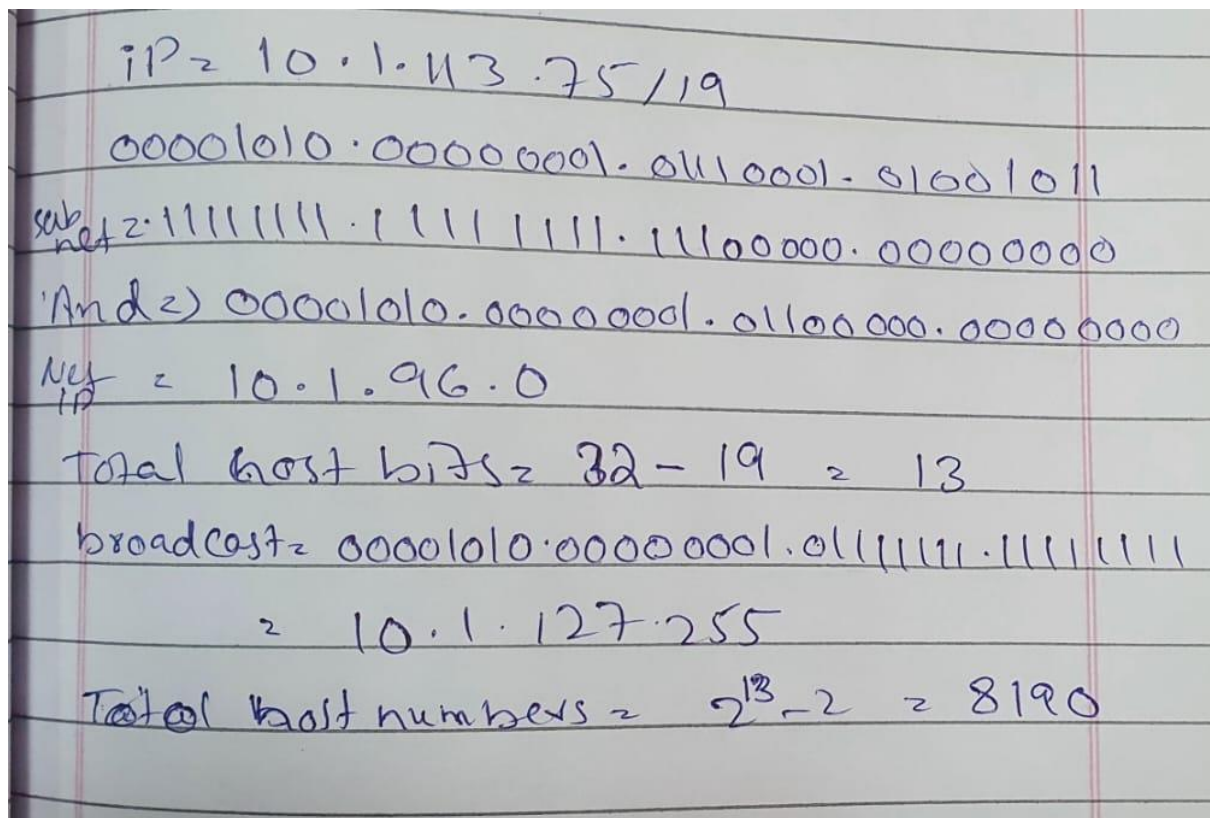
Network Address: 10.1.96.0

Broadcast Address: 10.1.127.255

Total Number of Host Bits: 13

Total Number of Hosts: 8190

### Calculations:





d)

IPv4 Address/Prefix: 198.133.219.250/24

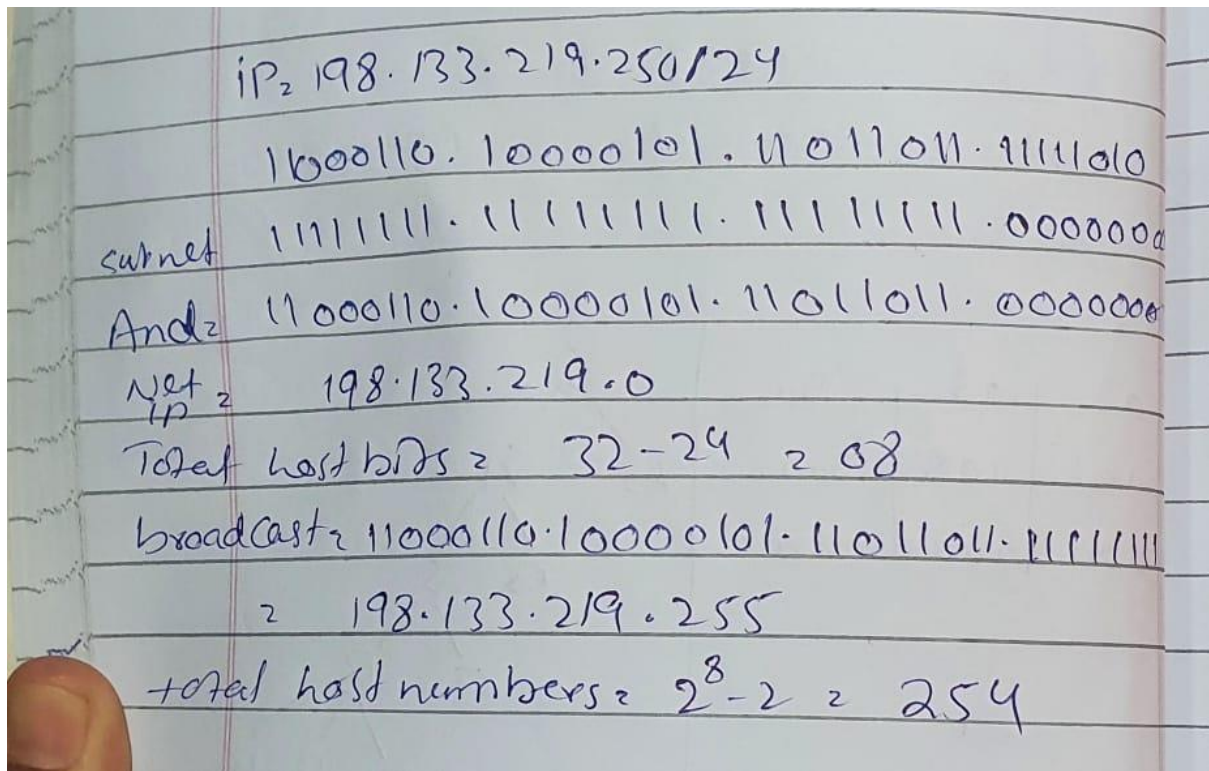
Network Address: 198.133.219.0

Broadcast Address: 198.133.219.255

Total Number of Host Bits: 08

Total Number of Hosts: 254

### Calculations:



## TASK 3:

With the following topology determine the number of networks needed and then design an appropriate addressing scheme.

IP address: 192.168.10.0/24

### 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? 1bit.
- 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:

<i>Subnet Number</i>	<i>Subnet Address</i>	<i>First Usable Host Address</i>	<i>Last Usable Host Address</i>	<i>Broadcast Address</i>
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:

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 sub-nets in Network Topology B.

- a. How many sub-nets are there? 6
- b. How many bits should you borrow to create the required number of sub-nets? 3
- c. How many usable host addresses per sub-net are in this addressing scheme? 30
- d. What is the new sub net mask in dotted decimal format? 255.255.255.244
- e. How many sub-nets are available for future use? 2

### Step 2: Record the subnet information.

Fill in the following table with the subnet information:

<i>Subnet Number</i>	<i>Subnet Address</i>	<i>First Usable Host Address</i>	<i>Last Usable Host Address</i>	<i>Broadcast Address</i>
1	192.168.10.0	192.168.10.1	192.168.10.126	192.168.10.127
2	192.168.10.128	192.168.10.129	192.168.10.254	192.168.10.255
3	192.168.10.64	192.168.10.65	192.168.10.94	192.168.10.95
4	192.168.10.96	192.168.10.97	192.168.10.126	192.168.10.127
5	192.168.10.128	192.168.10.129	192.168.10.158	192.168.10.159
6	192.168.10.160	192.168.10.161	192.168.10.190	192.168.10.191
7	192.168.10.192	192.168.10.193	192.168.10.222	192.168.10.223
8	192.168.10.224	192.168.10.225	192.168.10.254	192.168.10.255



### Step 3: Assign addresses to network devices in the subnets.

a. Fill in the following table with IP addresses and subnet masks for the router interfaces:

<i>Device</i>	<i>Interface</i>	<i>Ip address</i>	<i>Subnet</i>
R1	GigabitEthernet0/1	192.168.10.1	255.255.255.224
	Serial 0/0/0	192.168.10.33	255.255.255.224
	Serial 0/0/1	192.168.10.65	255.255.255.224
R2	GigabitEthernet0/1	192.168.10.97	255.255.255.224
	Serial 0/0/0	192.168.10.34	255.255.255.224
	Serial 0/0/1	192.168.10.129	255.255.255.224
R3	GigabitEthernet0/1	192.168.10.161	255.255.255.224
	Serial 0/0/0	192.168.10.66	255.255.255.224
	Serial 0/0/1	192.168.10.130	255.255.255.224