Date: 9/5/2025

Lab Practical #10:

Study of IP Addressing and sub-netting.

Practical Assignment #10:

1.Find default subnet masks, network bits, host bits, hosts per subnet, no of subnets, subnet number, 1st valid IP address, last valid IP address, and broadcast address.

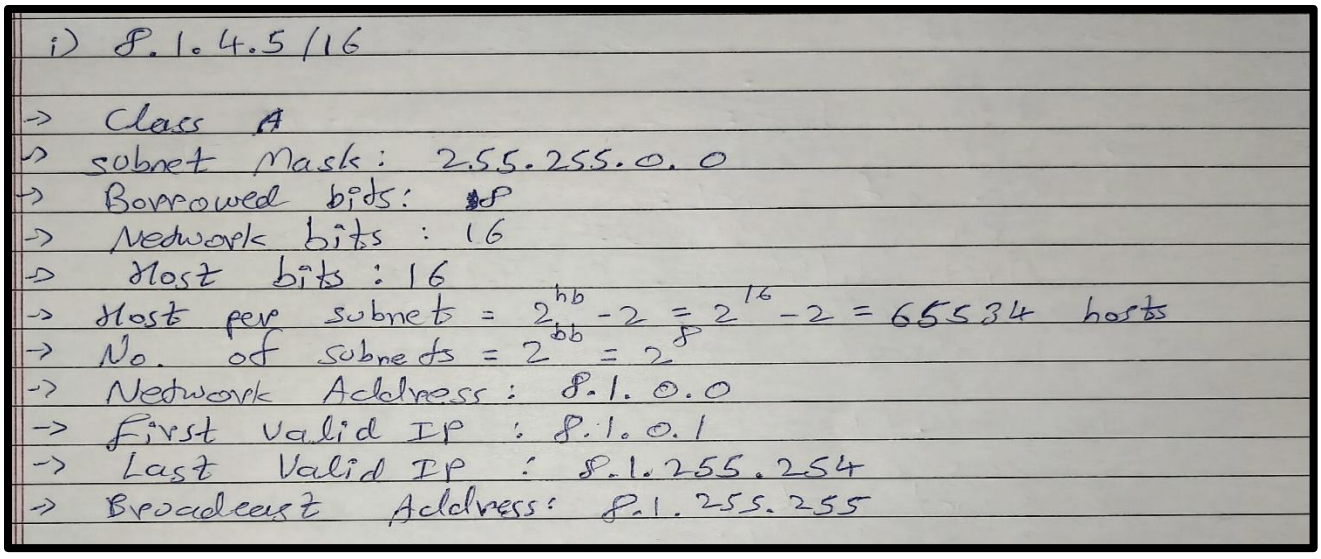
8.1.4.5/16

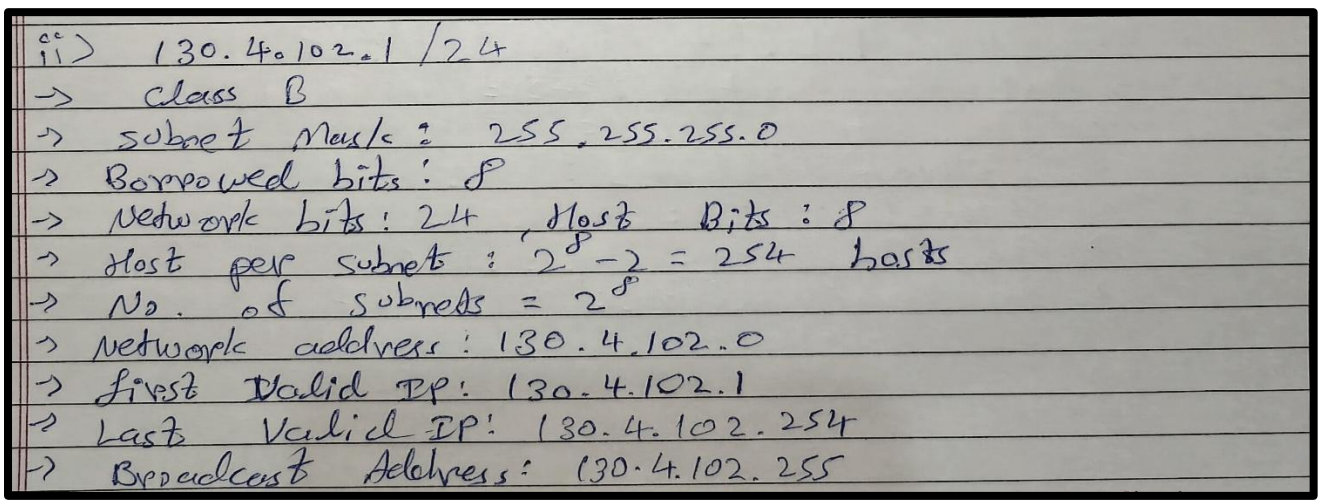
130.4.102.1/24

130.4.102.1/22

199.1.1.100/27

Ans:





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iii) 130.4.102.1/22

-> Class B
-> subnet mask : 255.255.255.0
-> Borrowed bits: 6
-> Network bits: 22, Host bits: 10
-> Host per subnet : $2^{10} - 2 = 1022$ hosts
-> No. of subnets: 2^6
-> Network Address: 130.4.100.0
-> First Valid IP: 130.4.100.1
-> Last valid IP: 130.4.100.254
-> Broadcast Address: 130.4.100.255

iv) 199.1.1.100/27

-> Class C
-> Subnet mask : 255.255.255.224
-> Borrowed bits: 3
-> Network bits: 27, hosts bits: 5
-> Host per subnet : $2^5 - 2 = 30$ hosts
-> No. of subnets = 2^3
-> Network Address: 199.1.1.96
-> First Valid IP: 199.1.1.97
-> Last Valid IP: 199.1.1.126
-> Broadcast Address: 199.1.1.127

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2. A host in a class C network has been assigned an IP address 192.168.17.9. Find the number of addresses in the block, the first address, and the last address.

Ans:

IP = 192.168.17.9

Class C

No. of addresses in the block, $2^8 = 256$

First Address : 192.168.17.0

Last Address : 192.168.17.255

3. An address in a block is given as 185.28.17.9. Find the number of addresses in the block, the first address, and the last address.

Ans:

IP = 185.28.17.9

Class B

No. of addresses in the block, $2^{16} = 65536$

First Address : 185.28.0.0

Last Address : 185.28.255.255

4. A block of addresses is granted to a small organization. We know that one of the addresses is 205.16.37.39/28. What is the first address, last address, number of addresses in a block?

Ans:

IP = 205.16.37.39/28

Class C

No. of addresses in the block, $2^4 = 16$

host bits = 4

borrowed bits = 4

First Address : 205.16.37.32

39 -> 00100111 => 00100000

Last Address : 205.16.37.47

39 -> 00100111 => 00101111

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5. Subnet the IP address 216.21.5.0 into 30 hosts in each subnet. Find Class, Default Mask, subnet mask, Bit Borrowed, New subnet mask, No. of Hosts & Subnet, Network Ranges (Subnets).

Ans:

IP = 216.21.5.0, 30 hosts in each subnet

⇒ Class C

No. of host in each subnet = $2^{hb} - 2$

$\therefore 2^{hb} - 2 = 30$

$\therefore$ hb = host bits = 5

⇒ Network bits = 27

⇒ Borrowed bits = 3

⇒ ~~Also~~ No. of subnets : $2^3 = 8$

No. of host per subnet = 30

⇒ Network Ranges,

216.21.5.0 → 216.21.5.31

216.21.5.32 → 216.21.5.63

216.21.5.64 → 216.21.5.95

216.21.5.96 → 216.21.5.127

216.21.5.128 → 216.21.5.159

216.21.5.160 → 216.21.5.191

216.21.5.192 → 216.21.5.223

216.21.5.224 → 216.21.5.255

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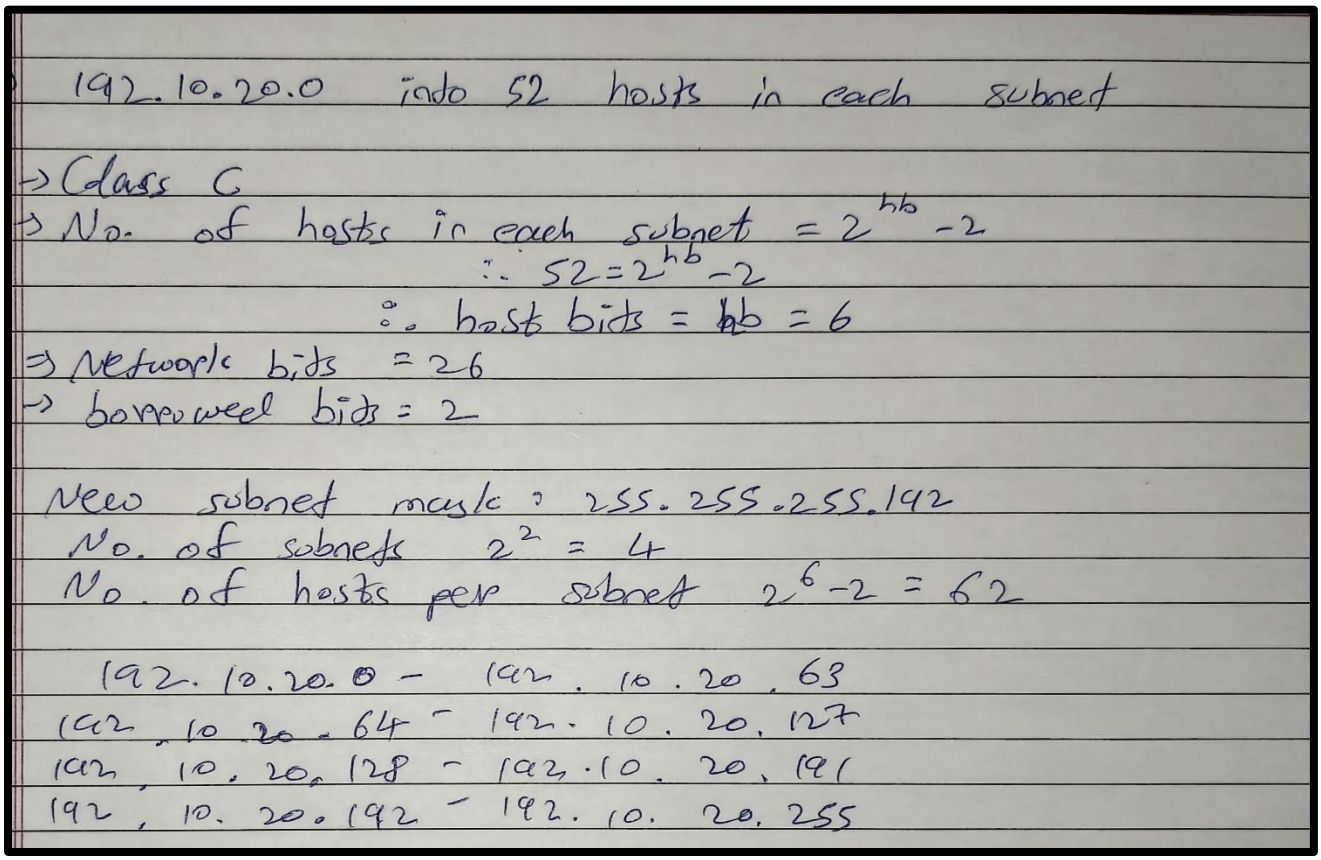
6. Subnet the IP address 192.10.20.0 into 52 hosts in each subnet. Find Class, Default Mask, Bit Borrowed, New subnet mask, No. of Hosts & Subnet, Network Ranges (Subnets).

Ans:



7. Determining the Subnet mask for Devices A and B:

a) Device A: 172.16.17.30/20

b) Device B: 172.16.28.15/20

Ans: