Subnetting: goal — relieve network congestion (too crowded)

**Ex:** IP Add : 192.168.20.0

Subnet mask : 255.255.255.192 (192 → class C)

fixed (custom)

1) Block size (Range) = 256 − 192 = 64 (H, L) (Host/Pen subnet) or, $2^6 = 64$

2) No. of subnets:

Subnet mask : 255.255.255.192

11111111.11111111.11111111.11000000

2 network bits

∴ subnets = $2^2 = 4$

3) no. of valid host in each subnet:

2 network bits

∴ host bit = 6 (0)

∴ valid host no. (each subnet) = $2^6 - 2 = 62$

(2 → 1st for net id; last for broadcast ID)

4) 1st and last valid host of each subnet:

P.T.O

1st Add. of Range / Network ID

Subnet ID : 192.168.20.0 → 192.168.20.64 → 192.168.20.128

→ 192.168.20.192

(Range 64, 64 add each time

2nd add. of range ← First valid host: (1st X)

192.168.20.1 → 192.168.20.65 → 192.168.20.129

→ 192.168.20.193

Last 2nd ← Last valid host: 192.168.20.62 → 192.168.20.126

→ 192.168.20.190 → 192.168.20.254

Bnoadcast Add: 192.168.20.63 → 192.168.20.127

(Last add of Range) → 192.168.20.191 → 192.168.20.255

Ex: 192.168.2.10/27

a) what is the subnet mask?

→ 11111111.11111111.11111111.11100000

↓27 bits

dec: 255.255.255.224 (custom sub. mask)

b) no. of subnets: □.□.□.11100000

3 net. bits

∴ subnets = $2^3 = 8$

c) Block size / Host per subnet: 256 − 224

= 32

host bits ← on, $2^{(5)} = 32$

d) Find out the net. add ?

→ IP : 192 : 168 . 2 . 10

11000000 . 10101000 . 00000010 . 00001010

27 net. bits ↓ host bits

— make it 0

same . 5 . 5 . 00000000

net add 192, 168. 2. 0

e) find out the broadcast address ?

→ 192 . 168 . 2 . 10

11000000 . 10101000 . 00000010 . 00001010,

host bits → make all 1

□ . □ . □ . 00011111

→ 192 . 168 . 2 . 31 (broadcast add.)

f) Last valid host : ?

→ Before broadcast : 192.168.2.30

g) 1st valid host : 192.168.2.1