CS & IT ENGINEERING

Computer Networks

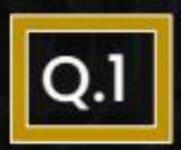**Classless Addressing**

DPP 09 (Discussion Notes)

By- Ankit Doyla Sir

Suppose, a network 102.105.108.79/26 is divided into 4 subnets. Then the subnet mask contains __28__ ones.

$$NID = 26 \text{ bit}, \quad HID = 32 - 26 = 6 \text{ bit}$$

$$\underset{26}{NID} \quad \underset{6}{HID}$$

$$\boxed{4 \text{ subnet}}$$

$$\underset{NID}{26} \quad \underset{SID}{2} \quad \underset{HID}{4}$$

No. of 1's in the S.M = NID + SID = 26 + 2 = 28

Q.2 In the network 212.69.78.58/28. The <u>fourth</u> octet (in decimal) of first IP address of the <u>network</u> which can be assigned to a hos?

__49__.

$NID = 28\,bit, HID = 4\,bit$

[NAT]

$$212.69.78.\underbrace{0011}|\underbrace{----}_{HID}$$

$$\underbrace{8 + 8 + 8 + 4}_{NID}$$

$$212.69.78.00110001 \rightarrow 212.69.78.\boxed{49}$$

Q.3 Consider a hypothetical CIDR based address (P)(W)
212.129.244.87/20. The ISP wants to create 4 subnets for GATE
wallah, Physics wallah, Engineers wallah and CA wallah. Which
of the following range is possible for GATE Wallah?   **[MCQ]**

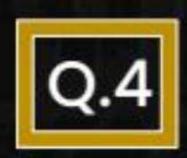| SID bits	
00	Physics wallah
01	CA wallah
10	GATE wallah
11	Engineers wallah

NID = 20 bit
HID = 32.20 = 12 bit

A. 212.129.244.254/22 to 212.129.247.255/22

B. 212.129.240.0/20 to 212.129.248.255/22

C. 212.129.248.0/22 to 212.129.251.255/22

D. 212.129.240.0/22 to 212.129.248.255/21

२१२.१२९. 1111 _ _ _ _ _ _ _ _ _ _ _ _

$\underbrace{8 + 8 + 4}_{\text{NID}}$　$\underbrace{}_{\text{HID=12 bit}}$

$\boxed{\text{4 subnet}}$

$\underbrace{२१२.१२९. 1111}_{\text{NID}}$,　$\underbrace{\square\square}_{\text{SID}}$　$\underbrace{\text{_ _ _ _ _ _ _ _ _ _}}_{\text{HID=10 bit}}$

$\underbrace{२१२.१२९. 1111}_{\text{NID}}$ 1000.00000000　→　२१२.१२९.२४8. 0 |२२

⋮

$\underbrace{२१२.१२९. 1111}_{\text{NID}}$ 1011. 11111111　→　२१२.१२९. २5१.२55|२२
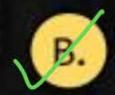
Suppose, a block contains 128 IP addresses, which of the following can be first host address of the block?　**[MSQ]**

A.　$198.174.68.1 : 198.174.68.0\boxed{0000001}$

B.　$198.174.68.129 : 198.174.68.1\boxed{0000001}$

C.　$198.174.68.0$

D.　$198.174.68.128 : 198.174.68.1\boxed{0000000}$

No. of IP Addresses $= 2^7$

Block Size $= 2^7$

HID $= 7$ bit

$\boxed{0000001}$

Q.5

A block contains 2048 IP addresses. Which of the following can be first address of the block?
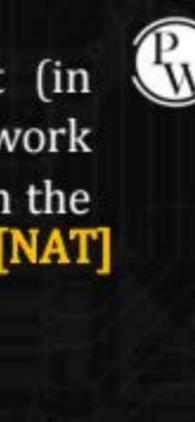
[MCQ]

A. $16.15.19.0 : 16 \cdot 15 \cdot 000 \, 1 \, 0 \boxed{\underset{\text{Rem or HID}}{0 \, 11 \cdot 00000000}} / 2^{11}$

B. ✓ $16.15.16.0 : 16 \cdot 15 \cdot 00010\boxed{\underset{\text{Rem or HID}}{000 \cdot 00000000}} / 2^{11}$

C. $16.15.20.0 : 16 \cdot 15 \cdot 00010\boxed{\underset{\text{Rem or HID}}{100 \cdot 00000000}} / 2^{11}$

D. Both (b) and (c)

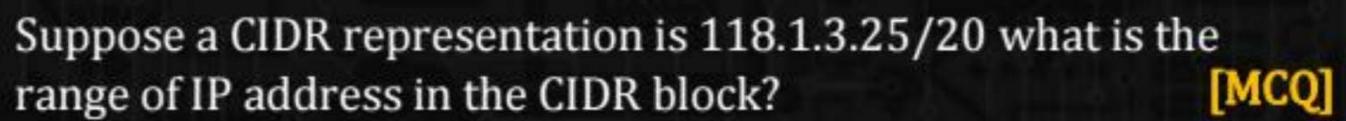No. OF IP Addresses $= 2048$
$$= 2^{11}$$

Block size $= 2^{11}$

HID $= 11$ bit

Q.6 Consider a network 194.193.89.114/28. The last octet (in decimal) of first IP address and last IP address of the network that can be assigned to a host are X and Y respectively then the value of Y − X is ___126 −113 = 13___   [NAT]

$$194 \cdot 193 \cdot 89 \cdot \underbrace{\underbrace{0111}_{NID} 0010}_{}$$
$$8 + 3 + 8 + 4 \underbrace{\quad}_{HID}$$

$$194 \cdot 193 \cdot 89 \cdot 0111 \underbrace{\_\_\_\_}_{HID}$$

$$194 \cdot 193 \cdot 89 \cdot 0111 0001 \rightarrow 194 \cdot 193 \cdot 89 \cdot 113 \quad (X)$$

$$194 \cdot 193 \cdot 89 \cdot 0111 1110 \rightarrow 194 \cdot 193 \cdot 89 \cdot 126 \quad (Y)$$

Q.7 Suppose a CIDR representation is 118.1.3.25/20 what is the range of IP address in the CIDR block?

[MCQ]

$NID = 20\,bit$
$HID = 32 - 20 = 12\,bit$

(A.) ✓ 118.1.0.0 to 118.1.15.255

(B.) 118.1.3.0 to 118.1.3.255

(C.) 118.1.2.0 to 118.1.3.254

(D.) None of these

118.1.0000 ---- . ---- ----

8 + 8 + 4   HID=12bit

NID

118.1.0000 0000 . 00000000 → 118.1.0.0

.
.
.

118.1.0000 1111 . 11111111 → 118.1.15.255

Q.8

An internet service provider (ISP) has the following chunk of CIDR – based IP addresses available with it: 245.248.128.0/20. The ISP wants to give half of this chunk of addresses to organization A, and quarter to organization B, while retaining the remaining with itself. Which of the following is a valid allocation of addresses to A and B?

[MCQ]

Gate -2m

A. 245.248.136.0/21 and 245.248.128.0/22 ✓

B. 245.248.128.0/21 and 245.248.128.0/22

C. 245.248.132.0/21 and 245.248.132.0/21

D. 245.248.136.0/24 and 245.248.132.0/21

THANK YOU GW SOLDIERS !