Branch : CSE & IT Batch : Hinglish

Computer Network

IPv4 Addressing

DPP 09

[NAT]

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

[NAT]

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

[MCQ]

3. Consider a hypothetical CIDR based address 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?

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

(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

[MSQ]

4. Suppose, a block contains 128 IP addresses, which of the following can be first host address of the block?

(a) 198.174.68.1

(b) 198.174.68.129

(c) 198.174.68.0

(d) 198.174.68.128

[MCQ]

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

(a) 16.15.19.0

(b) 16.15.16.0

(c) 16.15.20.0

(d) Both (b) and (c)

[NAT]

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 _____.

[MCQ]

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

(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

[MCQ]

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?

(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

Answer Key

1. **(28)**
2. **(49)**
3. **(c)**
4. **(a, b)**
5. **(b)**
6. **(13)**
7. **(a)**
8. **(a)**

Hints & Solutions

1. (28)

Network = 102.105.108.79/26

NID = 26 bits

To divide the network into 4 subnets 2 bits needed.

SID bits = 2

The number ones in SM = 26 + 2

= 28

2. (49)

IP = 212.69.78.58/28

NID = 28 bit

HID = 4 bit

NID = 212.69.78.58

255.255.255.240

212.69.78.48

First host = 212.69.78.49

Last octet = 49.

3. (c)

IP = 212.129.244.87/20

NID = 20 bit

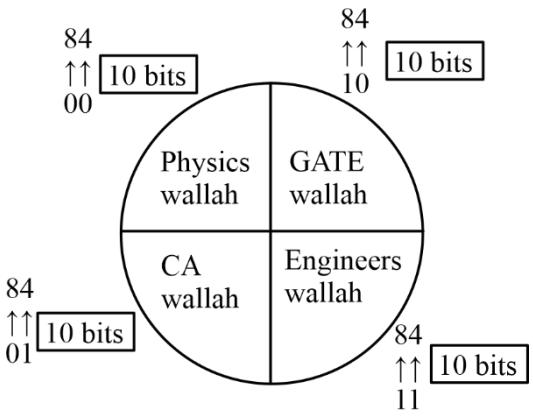
SID = 2 bit

HID = 10 bit

NID = 212.129.11110100.87

255.255.240.0

212.129.240.0



SID for GATE wallah = 212.129.111110 00.00000000

↓ HID (10 bits)

SID GW

SID = 212.129.148.0

First host = 212.129.248.1

Last host = 212.129.11111011.11111110

= 212.129.251.254

DBA = 212.129.251.255

Range = 212.129.248.0 to 212.129.251.255

Hence, option (c) is correct.

4. (a, b)

The number of IP address = 128

= 7 (bit)

- For first host last 7 bit must be 0000001

(a) 198.174.68.0**0000001** valid

(b) 198.174.68.1**0000001** valid

(c) 198.174.68.0**0000000** invalid

(d) 198.174.68.1**0000000** invalid

Hence, options (a, b) are correct.

5. (b)

The number of IP addresses = 2048

= 11 bits

HID bits = 11

Last 11 bits of the network must be 000.00000000.

(a) 16.15.00010**011.00000000** invalid

(b) 16.15.00010**000.00000000** valid

(c) 16.15.00010**100.00000000** invalid

Hence, option (b) is correct.

6. (13)

Network = 194.193.89.114/28

NID = 255.255.255.240

194.193.89.114

194.193.89.112

NID = 194.193.89.01110000

First host = 194.193.89.01110001

Last host = 194.193.89.01111110

DBA = 194.193.89.01111111

Last octet of first host = 01110001

$X = 113$

Last octet of last host = 011111110

$Y = 126$

$Y - X = 126 - 113$

$= 13$

7. (a)

Network = 118.1.3.25/20

NID bits = 20

SID bits = 12

Network ID = 118.1.00000000.00000000

HID

First host = 118.1.00000000.00000001

Last host = 118.1.00001111.11111110

DBA = 118.1.00001111.11111111

Range = 118.1.0.0 to 118.1.15.255

Hence, option (a) is correct.

8. (a)

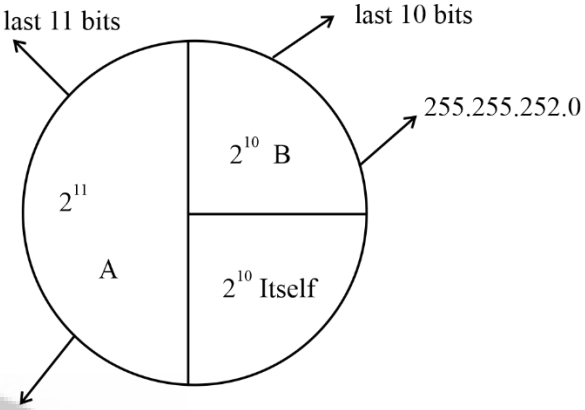
IP = 245.248.128.0

SM = 255.255.240.0

Organization A = 2^{11}

Organization B = 2^{10}

It self = 2^{10}



SM = 255.255.248.0

A = 245.248.136.0/21

B = 245.248.128.0/22

Hence, option (a) is correct.