

# CS & IT ENGINEERING

COMPUTER NETWORKS

IPv4 Addressing

Lecture No-13



**By- Ankit Doyla Sir**



TOPICS TO  
BE  
COVERED



**Subnetting Part-6**



# Subnetting Category 7

Q.1

MSQ

class-c

If Direct Broadcast Address is 200.200.200.31

Which of the following can be Subnet Mask ?

☒ A. 255.255.255.192

☒ B. 255.255.255.224

☒ C. 255.255.255.248

☐ D. 255.255.255.128

(B, C)

200.200.200. 000 11111  
NID HID

HID can be maximum  
5 bit. ( $HID \leq 5 \text{ bit}$ )



❌ 255.255.255.192

255.255.255. 11 000000  
 NID SID HID

00 111111 → 63

01 111111 → 127

10 111111 → 191

11 111111 → 255

AD Rule

HID=6 bit (HID ≤ 5 bit) No

option A incorrect

✓ (b) 255.255.255.224

255.255.255.11100000  
 NID SID HID

000 11111 → 31  
001 11111 → 63  
010  
011  
100  
101  
110  
111

AD Rule

HID = 5 bit (HID ≤ 5 bit) yes  
 so option 'B' is correct



✓ c) 255.255.255.248

255.255.255.1111000  
 NID SID HID

SSSSS HH  
 00011 111 → 31

AD Rule

HID = 3 bit (HID ≤ 5 bit) Yes  
 So option 'c' is correct

✗ d) 255.255.255.128

255.255.255.10000000  
 NID SID HID

0 1111111 → 127  
 1 1111111 → 255

AD Rule

HID = 7 bit (HID ≤ 5 bit) No  
 So option 'd' is  
 incorrect



**Q.2**

If Direct Broadcast Address is 200.200.200.31

Which of the following can be Subnet Mask?

A. 255.255.255.192

✓ B. 255.255.255.224

✓ C. 255.255.255.248

✓ D. 255.255.255.240

(B, C, D)

200.200.200.00011111  
NID                      HID

HID can be maximum  
5 bit ( $HID \leq 5 \text{ bit}$ )

✗ 255.255.255.11000000  
NID                      SID                      HID

HID = 6 bit ( $HID \leq 5 \text{ bit}$ ) No

$\frac{NID}{24}$      $\frac{SID}{1}$      $\frac{OR}{HID}{6}$   
-- 1111111

31: 00011111



✓ b) 255.255.255.11100000  
           NID      SID  HID

HID = 5 bit (HID ≤ 5 bit) yes

OR

NID      SID      HID  
 24      3      5

31: 000 11111

---      -----  
   SID      HID  
 --- 11111

✓ (c) 255.255.255.1111000  
HID

HID = 3bit (HID ≤ 5bit) ✓

✓ (d) 255.255.255.11110000  
HID

HID = 4bit (HID ≤ 5bit) ✓



Q.3

MCQ



What could be the Network Mask, if DBA of a Network is

168.17.7.255? : 168.17.0000111.11111111  
NID HID

HID can be maximum 11 bit ( $HID \leq 11 \text{ bit}$ )

HID = 11 bit (yes)

A. 255.255.248.0 : 255.255.1111000.00000000

B. 255.255.252.0 : 255.255.1111100.00000000  
HID = 10 bit ( $HID \leq 11 \text{ bit}$ ) yes

C. 255.255.254.0 : 255.255.1111110.00000000  
HID = 9 bit ( $HID \leq 11 \text{ bit}$ ) yes

✓ D. All the above



Gate (mcq)

Q.4

A Subnetted Class B network has the following broadcast address : 144.16.95.255. Its subnet mask

A.

is necessarily 255.255.224.0

255.255.11100000.00000000  
HID=13bit (HID ≤ 13bit) ✓

B.

is necessarily 255.255.240.0

255.255.255.11110000.00000000  
HID=12bit (HID ≤ 13bit) ✓

C.

is necessarily 255.255.248.0

255.255.255.11111000.00000000  
HID=11bit (HID ≤ 13bit) ✓

✓ D.

could be any one of 255.255.224.0, 255.255.240.0, 255.255.248.0

DBA

144.16.01011111.11111111

HID can be  
Maximum  
13bit (HID ≤ 13bit)



**Q.5**

→ class-A

Given broadcast address 125.25.63.255 of a subnetwork.  
What can be Mask of this subnetwork :

~~A.~~

255.255.128.0 :  $\frac{255}{NID} \cdot \frac{11111111}{SID} \cdot \frac{10000000 \cdot 00000000}{HID=15 \text{ bit } (HID \leq 14 \text{ bit}) \text{ No}}$

B.

255.255.192.0 :  $\frac{255}{NID} \cdot \frac{11111111}{SID} \cdot \frac{11000000 \cdot 00000000}{HID=14 \text{ bit } (HID \leq 14 \text{ bit}) \text{ yes}}$

C.

255.255.224.0 :  $\frac{255}{NID} \cdot \frac{11111111}{SID} \cdot \frac{11100000 \cdot 00000000}{HID=13 \text{ bit } (HID \leq 14 \text{ bit}) \text{ yes}}$

☒ D.

Both B and C

DBA :  $\frac{125}{NID} \cdot \frac{00011001}{SID} \cdot \frac{00111111 \cdot 11111111}{HID \text{ can be maxim. } 14 \text{ bit } (HID \leq 14 \text{ bit})}$



**Q.6**

If Direct Broadcast address is 200.200.200.31  
Which of the following can be Subnet Mask ?

- ☒ A. 255.255.255.192
- ☒ B. 255.255.255.224
- ☒ C. 255.255.255.198
- ☒ D. 255.255.255.128

DBA : 200.200.200.00011111

HID can  
be maximum  
5 bit  
(HID ≤ 5 bit)

Ⓐ 255.255.255.192

255.255.255.11000000  
NID SID HID

HID = 6 bit (HID ≤ 5 bit) No



✓ ①  $\underline{255.255.255} \cdot \underline{11100000}$   
 NID SID HID

HID = 5 bit (HID ≤ 5 bit) ✓

✗ ②  $255.255.255 \cdot \underline{10000000}$   
 HID = 7 bit

HID ≤ 5 bit (No)

✗ ③  $255.255.255.198$

$\underline{255.255.255} \cdot \underline{11000110}$   
 NID S S H H H S S H

HID = 4 bit (HID ≤ 5 bit) ✓

$\frac{\text{NID}}{24}$     S S H H H S S H  
 - - 1 1 1 - - 1

31: 000 1 1 1 1 1

# Subnetting Category 8





## MSQ

1. If subnet mask is 255.255.255.240, then which of the following can be Direct broadcast address

✓ ☒ A. 200.56.78.31 [00011111]

✓ ☒ B. 200.56.78.15 [00001111]

☒ C. 200.56.78.10 [00001010]

✓ ☒ D. 200.56.78.47 [00101111]

SM: 255.255.255.11110000  
           NID                  HID

HID = 4 bit

No. of IP Add =  $2^4$

No. of Host =  $2^4 - 2$

(A, B, D)



2. If subnet mask is 255.255.255.248, then which of the following can be Direct broadcast address

☒ A. 200.32.64.135 [ 10000111 ]

Sm: 255.255.255. 1111000  
HID

☐ B. 200.32.64.240 [ 11110000 ]

HID = 3bit

☒ C. 200.32.64.207 [ 11001111 ]

255  
231

☒ D. 200.32.64.231 [ 11100111 ]

(A, C, D)

24



3. If subnet mask is 255.255.240.0, then which of the following can be Direct broadcast address

✓ **A.** 157.157.15.255 [ 0000 1111.11111111 ] SM: 255.255.1111 0000.00000000  
 12 bit 16 bit

~~**B.**~~ 157.157.7.255 [ 00000 111.11111111 ]  
 12 bit

**C.** 157.157.15.250 ✗

✓ **D.** 157.157.31.255 [ 000 11111.11111111 ]  
 12 bit



4. If subnet mask is 255.224.0.0, then which of the following can be Direct broadcast address

✓ A.  $5 + 8 + 8 = 21$   
100.31.255.255

31: 00011111

✗ B.  $3 + 8 + 8 = 19$   
100.7.255.255

7: 00000111

✓ C.  $6 + 8 + 8 = 24$   
100.63.255.255

63: 00111111

✗ D. 100.30.255.255  
00001110 · 111111 · 111111

SM: 255.11100000 · 00000000 · 00000000  
0 HD = 21 bit



5. If subnet mask 255.255.255.224, which of the following will be Direct Broadcast address?

SM: 255.255.255.11100000  
HID

HID = 5 bit

- A. 202.15.19.127 [01111111]
- B. 202.15.19.63 [00111111]
- ✓ C. Both a and b
- D. None of the above

