

## Computer Network

## IPv4 Addressing

DPP 07

**[MCQ]**

1. Consider the subnet mask 255.255.224.0 then which of the following is a valid broadcast address?
- 180.180.15.255
  - 180.180.31.0
  - 180.180.31.255
  - 180.180.255.31

**[MSQ]**

2. Consider a subnet mask for a network is 255.255.255.252. Then, which of the following is/are possible direct broadcast address?
- 200.200.200.15
  - 200.200.200.31
  - 200.200.200.63
  - 200.200.200.3

**[MSQ]**

3. Suppose, direct broadcast address of network is 210.210.210.63 then which of the following is/are always true, for subnet mask?
- In subnet mask number of ones are exactly 26.
  - In subnet mask number of ones are at most 26.
  - In subnet mask number of ones are at least 26.
  - In subnet mask Host ID bits are at most 6.

**[MCQ]**

4. Two computers  $P_1$  and  $P_2$  configured as follows:  $P_1$  has IP address 160.170.3.67 and Net mask 255.240.0.0 and  $P_2$  has IP address 160.169.80.59 and Net mask 255.248.0.0 which of the following statement is true?
- $P_1$  and  $P_2$  both assume they are on the same network.
  - $P_2$  assume  $P_1$  is on same network, but  $P_1$  assume  $P_2$  is on different network.
  - $P_1$  assume  $P_2$  is on same network, but  $P_2$  assume  $P_1$  is on different network.
  - $P_1$  and  $P_2$  both assume they are on different networks.

**[NAT]**

5. Consider the routing table given below:

Destination Network ID	Subnet mask	Interface
160.168.16.0	255.255.224.0	1
160.168.128.0	255.255.192.0	2
160.168.48.0	255.255.240.0	3
Default		4

On which interface will the router forward the packet? If packet bearing a destination address 160.168.63.130

**[MSQ]**

6. Consider the subnet mask 255.224.0.0, then which of the following can be direct broadcast address?
- 100.32.255.255
  - 100.64.255.255
  - 100.31.255.255
  - 100.63.255.255

**[MSQ]**

7. Consider two computers  $C_1$  and  $C_2$  are configured as follows:

	IP address	Net mask
$C_1$	192.198.2.53	255.255.224.0
$C_2$	192.198.76.99	255.255.192.0

Which of the following statements is/are false?

- $C_1$  and  $C_2$  both assume they are on the same network.
- $C_2$  assumes  $C_1$  is on same network, but  $C_1$  assumes  $C_2$  is on different network.
- $C_1$  assumes  $C_2$  is on same network, but  $C_2$  assumes  $C_1$  is on a different network
- $C_1$  and  $C_2$  both assume they are on different network.

**[MCQ]**

8. Consider a computer C1 is configured with IP address 203.197.89.99 and netmask 255.255.192.0. The DBA of the network is \_\_\_\_\_.

- (a) 203.197.89.0
- (b) 203.197.89.255
- (c) 203.197.64.0
- (d) 203.197.127.255



## Answer Key

- |                 |              |
|-----------------|--------------|
| 1. (c)          | 5. (3)       |
| 2. (a, b, c, d) | 6. (c, d)    |
| 3. (c, d)       | 7. (a, b, c) |
| 4. (a)          | 8. (d)       |



## Hints & Solutions

1. (c)

SM = 255.255.224.0

HID bits = 13 [last 13 bits must be 1 in DBA]

(a) 180.180.15.255 **Invalid**

(b) 180.180.31.0 **Invalid** because last decimal must be 255.

(c) 180.180.00011111.11111111 **valid**

(d) 180.180.255.31 **Invalid**

2. (a, b, c, d)

SM = 255.255.255.252

SM = 11111111.11111111.11111111.11111100

HID

Given SM is possible for class A, class B and Class C.

HID bits must be 1.

(a) 200.200.200.00001111 **valid**

(b) 200.200.200.00011111 **valid**

(c) 200.200.200.00111111 **valid**

(d) 200.200.200.00000011 **valid**

Hence, all options are correct.

3. (c, d)

Direct broadcast address = 210.210.210.00111111  
(class C)

- In subnet mask, host ID bits must be  $\leq 6$
- If host ID bits are  $\leq 6$  then, number of ones must be  $\geq 26$ .

Hence, option (c, d) are correct.

4. (a)

For system P1:

$IP_{P_1} = 160.170.3.67$

$SM_{P_1} = 255.240.0.0$

For System P2:

$IP_{P_2} = 160.169.80.59$

$SM_{P_2} = 255.248.0.0$

- $NID_{P_1P_1} = IP_{P_1} \text{ AND } SM_{P_1}$   
 $= 160.160.0.0$
- $NID_{P_2P_1} = IP_{P_2} \text{ AND } SM_{P_1}$

$= 160.160.0.0$

- $P_1$  assume,  $P_2$  present in same network

$NID_{P_1P_2} = IP_{P_1} \text{ AND } SM_{P_2}$

$= 160.168.0.0$

$NID_{P_2P_2} = IP_{P_2} \text{ AND } SM_{P_2}$

$= 160.168.0.0$

$P_2$  assume,  $P_1$  is in same network.

Hence option (a) is correct.

5. (3)

Destination IP = 160.168.63.130

**NID with SM 1:**

$NID = DIP \text{ AND } SM_1 (255.255.224.0)$

$= 160.168.0.0$  (Not matched)

**NID with SM 2:**

$NID = DIP \text{ AND } SM_2 (255.255.192.0)$

$= 160.168.0.0$  (Not matched)

**NID with SM 3:**

$NID = DIP \text{ AND } SM_3 (255.255.240.0)$

$= 160.168.48.0$  (matched)

Router will send the packet to interface 3.

6. (c, d)

SM = 255.11100000.00000000.00000000

HID bits = 21

- In DBA last 21 bits must be 1

(a) 100.32.255.255 **Invalid**

(b) 100.64.255.255 **Invalid**

(c) 100.31.255.255

100.00011111.11111111.11111111 **Valid**

HID bits

(d) 100.00111111.11111111.11111111 **Valid**

HID bits

## 7. (a, b, c)

192.198.00000010.00110101  
255.255.11100000.00000000  
 192.198.0.0

192.198.01001100.01100011  
255.255.11100000.00000000  
 192.198.64.0

C1 assume C2 is in different network.

192.198.00000010.00110101  
255.255.11100000.00000000  
 192.198.0.0

192.198.01001100.01100011  
255.255.11000000.00000000  
 192.198.64.0

C2 assume C1 is in different network

∴ Both C1 and C2 assume they are on the different network.

## 8. (d)

203.197.01011001.01100011  
255.255.11000000.00000000

Net ID → 203.197.64.0

DBA → 203.197.127.255



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