Branch : CSE & IT Batch:Hinglish

WEEKLY TEST – 02

Subject : Computer Networks

Topic : Subnetting

Maximum Marks 15

Q.1 to 5 Carry ONE Mark Each

[MCQ]

1. Consider a class C network 203.219.230.19 and subnet mask 255.255.255.128 which of the following is possible DBA for first subnet?

SID	Subnet number
0	2nd Subnet
1	First Subnet

(a) 203.219.230.255
(b) 203.219.230.127
(c) 203.219.230.0
(d) 203.217.230.128

[NAT]

2. Suppose, a class B network with subnet mask 255.255.224.0 the number of hosts per subnet is ___.

[NAT]

3. Consider an IP address of block is 196.197.198.78 and subnet mask 255.255.255.240. The subnet number for given IP address is _____.

[MCQ]

4. Consider an IP address in a block is 149.160.170.15 and subnet mask is 255.255.224.0. After finding subnet ID, what is the first host?

(a) 149.160.161.0
(b) 149.160.161.1
(c) 149.160.160.1
(d) 149.160.170.1

[MCQ]

5. A subneted class C network has the following broadcast address 203.205.196.159. Which of the following is possible subnet mask is for given DBA?

(a) 255.255.255.128
(b) 255.255.255.224
(c) 255.255.255.192
(d) Both (b) and (c)

Q.6 to 10 Carry TWO Mark Each

[NAT]

6. Classless inter-domain routing (CIDR) receives a packet with the address 139.46.38.98. The router's routing table has the following entries:

Prefix	Output Interface
139.30.0.0/12	1
139.32.0.0/11	2
139.44.0.0/14	3
Default	4

The identifier of the output interface on which this packet will be forwarded is ____.

[MCQ]

7. Consider an IP address in a block is 120. 126.212.59 and subnet mask is 255.240.0.0. To represent the 3rd subnet, SID bits are 0110 then, what is the last host of 3rd subnet?

(a) 120.32.255.254 (b) 120.116.255.254
(c) 120.111.255.254 (d) None of these

[NAT]

8. Consider the following configuration given below:

Host A	180.169.68.15
Router R_1	180.169.147.13 and 180.169.153.29
Router R_2	180.169.81.14 and 180.169.99.77
Host D	180.169.81.88

Suppose, Host A is connected through two router R_1 and R_2 to another host D with given IP addresses. The netmask is used in the network is 255.255.240.0. How many total distinct subnets are guaranteed to already exist in the network? _____

[MCQ]

9. Consider an IP address in a block is 21.69.28.26 and subnet mask contain 10 ones continuously then what is the DBA of last subnet?

(a) 255.255.225.255

(b) 21.255.255.255

(c) 21.127.255.255

(d) None of these

[NAT]

10. Consider an IP address in a block is 200. 200. 250.113 and subnet mask is 255.255.255.224. if subnet ID of IP address is X.Y.Z.P and subnet number is Q. Then, the value of $\frac{P}{Q}$ is _____.

Answer Key

1. **(a)**
2. **(8190)**
3. **(5)**
4. **(c)**
5. **(b)**
6. **(3)**
7. **(c)**
8. **(4)**
9. **(b)**
10. **(24)**

Hints and Solutions

1. (a)

SM = 255.255.255.10000000

SID

Network = 203.219.230.19

First Subnet ID = 203.219.230.128

DBA for 1st subnet = 203.219.230.255

Hence option (a) is correct.

2. (8190)

Class B =

NID	HID
16 bits	16 bits

Subnet mask = 255.255.224.0

= 11111111.11111111.11100000.00000000

Number of subnet bits

= number of 1's in subnet mask – NID bits

= 21 – 16 = 5

Number of hosts = Number of 0's in subnet mask

= 13

Number of hosts = $2^{13} - 2$

= 8 * 1024 – 2

= 8192 – 2 = 8190

3. (5)

SID = 196.197.198.78

255.255.255.240

196.197.198.64

SID bits = 4

SID = 196.197.198.01000000

Subnet number = 0100

= 4 + 1

= 5

4. (c)

IP address = 149.160.170.15

Subnet mask = 255.255.224.0

SID = 149.160.160.0

First host = 149.160.160.1

Hence, option (c) is correct.

5. (b)

DBA = 203.205.196.10011111

HID bits

HID bits ≤ 5

(a) 255.255.255.10000000

HID bits = 7 **(invalid)**

(b) 255.255.255.11100000

HID bits = 5 **(valid)**

(c) 255.255.255.11000000

HID bits = 6 **(invalid)**

Hence option (b) is correct.

6. (3)

For interface – 1:

SM = 11111111.11110000.00000000.00000000

= 255.240.0.0

139.46.38.98

255.240.0.0

139.32.0.0

(Not Matched)

Router will not forward this packet to interface – 1.

For – interface – 2:

SM = 11111111.11100000.00000000.00000000

= 255.224.0.0

139.46.38.98

255.224.0.0

139.32.0.0

(Matched)

Router will forward this packet to interface – 2

For interface – 3:

SM = 255.252.0.0

= 139.46.38.98

255.224.0.0

139.44.0.0 (Matched)

Router will forward this packet to interface – 3.

If more than 1 interface matched then router will forward the packet to longest subnet mask.

Hence, (3) is correct.

7. (c)

IP = 120.126.212.59

SM = 255.240.0.0

SID = 120.112.0.0

3rd subnet bits = 0110

3rd SID = 120.01100000.00000000.00000000

= 120.96.0.0

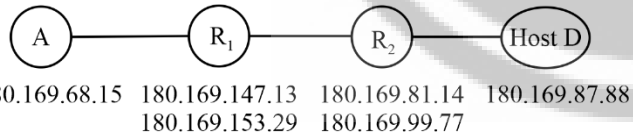
Last host of 3rd Subnet

= 120.01101111.11111111.11111111

= 120.111.255.254

Hence, option (c) is correct.

8. (4)



Netmask = 255.255.240.0

= 1111111.11111111.11110000.00000000

Find the SID of each IP address if first 4 bits of 3rd octet are same then they belong to same subnet.

Host A SID = 180.169.68.15

255.255.240.0

180.169.64.0

- Router R_1 SID with IP address 180.169.147.13.

  SID = 180.169.144.0
- Router R_1 SID with IP address 180.169.153.29

  SID = 180.169.144.0
- Router R_2 SID with IP address 180.169.81.14

  SID = 180.169.80.0
- Router R_2 SID with IP address 180.169.99.77

  SID = 180.169.96.0
- Host D SID with IP address 180.169.87.88

  SID = 180.169.87.88

255.255.240.0

180.169.80.0

Total different SID are 4.

9. (b)

IP = 21.69.28.26

SM = 11111111.11000000.00000000.00000000

= 255.192.0.0

SID of last host = 21.192.0.0

DBA of last host = 21.255.255.255

Hence, option (b) is correct.

10. (24)

SID = 200.200.250.113

255.255.255.224

200.200.200.96

P = 96

SID = 200.200.200.01100000

Subnet number (Q) = 011

= 3 + 1

= 4

$\frac{P}{Q} = \frac{96}{4} = 24$