Branch : CSE & IT **Batch : Hinglish**

Computer Network
IPv4 Addressing

DPP 04

[NAT]

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

[MCQ]

2. An organization has class B network and wishes to form subnet for 65 departments. The subnet mask would be?

(a) 255.255.0.0 (b) 255.255.254.0

(c) 255.255.194.0 (d) 255.255.252.0

[NAT]

3. In a class B network on the internet has a subnet mask 255.255.252.0. What is the minimum number of hosts per subnet is/are possible. So, that subnet mask fails? _____.

[NAT]

4. Suppose, network ID of entire network is 176.178.0.0 and subnet mask is 255.255.255.0. If X is the number of bits borrowed from HID and Y is the total number of subnets in network then the value of $\frac{Y}{X}$ is ____.

[NAT]

5. Suppose a network ID of network is 160.160.0.0 and subnet mask is 255.255.254.0. The total bits are borrowed from HID part is/are _____.

[MCQ]

6. If a class B network on the internet has subnet mask of 255.255.252.0. What is the maximum number of hosts/subnets? (Assume classful addressing scheme is followed)?

(a) 1022 (b) 2046

(c) 1023 (d) 2047

[MCQ]

7. Consider a class C network 15 subnets and 25 hosts per subnet. An appropriate subnet mask for this network would be?

(a) 255.255.240.0 (b) 255.255.255.254

(c) 255.255.255.240 (d) None of these

Answer Key

1. **(8190)**
2. **(b)**
3. **(1023)**
4. **(32)**
5. **(7)**
6. **(a)**
7. **(d)**

Hints & Solutions

1. (8190)

Class B = | NID (16 bits) | HID (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 host bit = Number of 0's in subnet mask

= 13

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

= 8 * 1024 – 2

= 8192 – 2

= 8190

2. (b)

Class = B

NID = 16 bits

HID = 16 bits

- To divide 65 departments, we have to borrow 7 bits from HID
- | NID | SID | HID |
  | 16 | 7 | 9 |

Number of 1's in subnet mask = 16 + 7 = 23

Subnet mask

= 11111111.11111111.11111110.00000000

= 255.255.254.0

3. (1023)

Subnet mask = 255.255.252.0

= 11111111.11111111.11111100.00000000

HID bits = 10

Maximum hosts/subnets = $2^{10} - 2 = 1022$

- With 1022 hosts per subnet, subnet mask will not be fail.
- When hosts/subnet are 1023 subnet mask would be fail because to connect 1023 hots/subnet, HID bit must be 11. But in given subnet mask HID bits are 10.

Hence, (1023) is correct.

4. (32)

Network 1D = 176.178.0.0 (class B)

Subnet mask = 255.255.255.0

= 11111111.11111111.11111111.00000000

NID bits = 16 bits

SID bits = 8 bits

HID bits = 8 bits

X = 8 bit

$Y = 2^8$

= 256

$\frac{Y}{X} = \frac{256}{8}$

= 32

Hence, (32) is correct

5. (7)

NID = 160.160.0.0 (Class B)

SM = 255.255.254.0

= 11111111.11111111.11111110.00000000

Number of bits for SID = 23 – 16 = 7

6. (a)

Subnet mask = 255.255.252.0

= 11111111.11111111.11111000.00000000

NID bits = 16

SID bits = 6

HID bits = 10

Number of hosts/subnets = 2^{10}

$= 2^{10} - 2$

= 1024 – 2

= 1022

Hence, option (a) is correct.

7. (d)

Class = C

Number of bits in NID = 24

Number of bits in HID = 8

Maximum number of hosts = $2^8 - 2$

= 254 possible

Total host given = $15 * 25$

$= 375$

$375 \nleq 254$

It means, if we divide this network into 15 subnets then maximum hosts cannot be 25.

Hence, option (d) is correct.