Branch : CSE & IT Batch : Hinglish

Computer Network

IPv4 Addressing

DPP 01

[NAT]

1. Let 2^p and 2^q be the number of networks present in class B and class C under IPv4 addressing format, the value of p + q is _____.

[MSQ]

2. Which of the following is/are VALID IP addresses belonging to class C under IPV4 addressing format?

(a) 191. 82. 129. 75

(b) 208. 21. 97. 120

(c) 224. 82. 31. 128

(d) 223. 32. 64. 124

[MCQ]

3. Consider a hypothetical IPv4 address of 36 bits where class A contain 2^{35} IP addresses. Then the number of IP address present in class D will be : (Assume classful address is used).

(a) 2^{28}

(b) 2^{32}

(c) 2^{34}

(d) None of these

[MCQ]

4. Which of the following is/are correct?

(a) Class A IPv4 address start form 0.0.0.0.

(b) Class B IPv4 address start from 127.0.0.0.

(c) Class C IPv4 address start from 191.0.0.0.

(d) None of the above.

[MCQ]

5. Consider the following statements-

I: The ratio of the number of IP addresses contained in class A to that of class E is 8:1.

II: The number of IP addresses contained in class D is 75% less than the number of IP addresses contained in class B.

Which of the above given statement(s) is/are INCORRECT?

(a) I only (b) II only

(c) Both I and II (d) Neither I nor II

[MCQ]

6. If the number of networks present in class B are 2^m, then number of hosts present in class C are : (classful addressing scheme is followed)

(a) $2^m - 2$

(b) $2^{m+2} - 2$

(c) $\sqrt{2^{m+2}} - 2$

(d) 2^m

[MSQ]

7. If number of network present in class B and class C are 2^p and 2^q respectively. And number of hosts present in B and class C are $(2^m–2)$ and $(2^n–2)$ respectively. Then which of the following is/are correct?

(a) Relation between p and q will be 2q = 3p.

(b) The number of networks present in class A $2^{n-1} – 2$ possible.

(c) Relation between m and n will be m = 2n.

(d) Relation between p and n will be 4p = 7n.

[MCQ]

8. Which of the following IP address cannot be assigned to any host?

(a) 127.10.15.243 (b) 129.46.255.255

(c) Both (a) and (b) (d) None of the above.

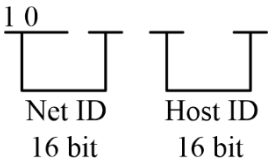
Answer Key

1. **(35)**
2. **(b, d)**
3. **(b)**
4. **(d)**
5. **(d)**
6. **(c)**
7. **(a, b, c, d)**
8. **(c)**

Hints & Solutions

1. (35)

Class B

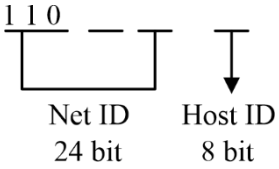


Number of networks

$= 2^{16-2} = 2^{14}$

p = 14

Class C



Number of networks

$= 2^{5+8+8} = 2^{21}$

q = 21

$\therefore$ p + q = 14 + 21 = 35

2. (b, d)

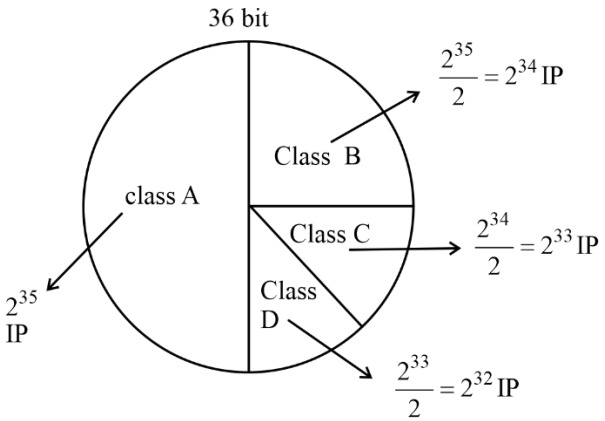
IP addresses belonging to class C are in the range 192·X·X·X – 233·X·X·X

$\therefore$ (b, d) are valid class C IP addresses

3. (b)

IPv4 address = 36 bit

Hypothetically given but practically not possible



4. (d)

- Range of class A is (1 – 126) because 0.0.0.0 is non routable IPv4 address it's used for default router **(FALSE)**
- Class B range is (128 to 191) 128.0.0.0 to 191.255.255.255 **(FALSE)**
- Class C IPv4 address range (192 to 223). So, 191.0.0.0 is of class B IPv4 address but not of class C. **(FALSE)**

5. (d)

	Number of IP addresses
Class A	2^{31}
Class B	2^{30}
Class C	2^{29}
Class D	2^{28}
Class E	2^{28}

Class A: Class E = $2^{31} : 2^{28} = 2^3 : 1 = 8 : 1$

(I) is correct

$$\frac{\text{Class B} - \text{Class D}}{\text{Class B}}$$

$$= \frac{2^{30} - 2^{28}}{2^{30}}$$

$$= \frac{2^{28}\left(2^2 - 1\right)}{2^{30}}$$

$$= \frac{3}{4}$$

= 75%

(II) is correct

6. (c)

- The number of networks in class B = 2^{14}
- The number of hosts in class C = $2^8 - 2$

$2^m = 2^{14}$

m = 14

(a) $2^m - 2 = 2^{14} - 2 \neq 2^8 - 2$ **(False)**

(b) $2^{m+2} - 2 = 2^{14+2} - 2 = 2^{16} - 2 \neq 2^8 - 2$ **(False)**

(c) $\sqrt{2^{m+2}} - 2 = \sqrt{2^{14+2}} - 2$

$= \sqrt{2^{16}} - 2$

$= 2^8 - 2$ **(True)**

Hence, option (c) is correct.

7. (a, b, c, d)

Given:

Number of Networks in class B = $2^p = 2^{14}$

Number of Networks in class C = $2^q = 2^{21}$

Number of Hosts in class B = $2^m - 2 = 2^{16} - 2$

Number of Hosts in class A = $2^n - 2 = 2^8 - 2$

- p = 14
- q = 21
- m = 16
- n = 8

(a) $\frac{p}{q} = \frac{14}{21}$

$\boxed{3p = 2q}$ **(True)**

(b) Class A networks = 126

$2^{n-1} - 2 = 2^{8-1} - 2$

$= 2^7 - 2$

$= 128 - 2$

$= 126$ **(True)**

(c) $\frac{m}{n} = \frac{16}{8}$

$\boxed{m = 2n}$ **(True)**

(d) $\frac{p}{n} = \frac{14}{8}$

$\boxed{4p = 7n}$ **(True)**

8. (c)

(a) 127.10.15.243 is reserved for loop back or self-connectivity testing.

(b) 129.46.255.255 it's a class B IP address.

10000000.00101110 . 11111111.11111111

NID HID

If all 1's present in HID part. This IP address cannot be assigned to any host (Reserved for special purpose). This IP address is used for DBA of the respective network.

Hence, option (c) is correct.