



Educative Site

ব্যাংক আইটি এক্সামসহ সকল আইটি এক্সামের জন্য খুবই গুরুত্বপূর্ণ আইটি ট্রেডমার্ক প্রশ্নাবলী এবং উত্তর

(পূর্ণাঙ্গ সমাধানসহ)

বিঃদ্রঃ

শুধু এই পিডিএফ থেকেই এক্সামে কমন পাওয়ার

৮০% গ্যারান্টি

রয়েছে।

আজই ডাউনলোড করে পড়াশুনা শুরু করুন
এবং যোজন যোজন দূরত্ব এগিয়ে যান

Networking/Sub-netting Math

1. Find subnet mask and complement subnet mask from the IP address 175.231.232.116/27

Solution:

Here, $n = \text{CIDR} = 27$

Network bit = 27

Host bit = $32 - n$

= $32 - 27$

= 5

So, Subnet Mask = 11111111.11111111.11111111.11100000

= 255.255.255.224

And, Complement Subnet Mask

= 00000000.00000000.00000000.00011111

= 0.0.0.31

2. Find Network address / IP address / First address of the Network or Network subnet ID from above IP address

Rule 1: ANDing given IP address with subnet mask (as bits are changed in the 4th octet, we only consider 4th octet here)

4th octet of given IP address (in binary) = 01110100

4th octet of subnet mask (in binary) = 11100000 ANDing we get = 01100000 = 96 So, Network Address = 175.231.232.96

Rule 2: Making host bits into zero of the given IP address

Here, host bit exists = $32 - 27 = 5$

and, given IP address's 4th octet = 116 = 01110100

converting host bits into zero we get = 01100000 = 96

So, Network Address = 175.231.232.96

3. Finding Broadcast Address

Rule 1: ORing given IP address with Complement Subnet mask (as bits are changed in the 4th octet, we only consider 4th octet here)

4th octet of given IP address (in binary) = 01110100

4th octet of Complement subnet mask (in binary) = 00011111 ORing we get = 01111111 = 127 So, Broadcast Address = 175.231.232.96

Rule 2: Making host bits into '1' of the Above Network address

Here, 4th octet of Network address = 01100000

So, host bit exists = $32 - 27 = 5$

converting host bits into '1' we get = 01111111 = 127

So, Broadcast Address = 175.231.232.127

4. Find First address and Last address

Here, Network address = 175.231.232.96

So, First Valid host = 175.231.232.97

And, here Broadcast address = 175.231.232.127

Last Valid host = 175.231.232.126

5. An organization has an IP address 192.168.1.0/24, It should divide this address such that -

HQ LAN1 has 50 hosts

HQ LAN2 has 50 hosts

Sales LAN1 has 30 hosts

Sales LAN2 has 30 hosts

IT LAN1 has 12 hosts

IT LAN2 has 8 hosts

Now calculate subnetting and find the network address, subnet mask, valid IP range, Broadcast address using VLSM

Solution:

Host	Network address	Host Range	Broadcast address	Subnet mask
50	192.168.1.0	Bit needed for 50 hosts are = 6 (as $2^6 = 64$ and $0 + 64 = 64$), So Host Range will be 192.168.1.1 to 192.168.1.62	192.168.1.63	Here, host bit = 6, So, making host bits Into zero we get Subnet mask = 255.255.255.192 Another way, here Network bits = $32 - 6 = 26$, So, CIDR = /26 and we say Full form = 192.168.1.0/26
50	192.168.1.64	192.168.1.65 to 192.168.1.126	192.168.1.127	255.255.255.192
30	192.168.1.128	192.168.1.129 to 192.168.1.158	192.168.1.159	255.255.255.224
30	192.168.1.160	192.168.1.161 to 192.168.1.190	192.168.1.191	255.255.255.224
12	192.168.1.192	192.168.1.193 to 192.168.1.206	192.168.1.207	255.255.255.240
8	192.168.1.208	192.168.1.209 to 192.168.1.222	192.168.1.223	255.255.255.240

6. An IP address 192.168.10.0/23, Find –

- Subnet Mask
- Unique ID (host) number
- Broadcast ID
- Last usable host address

Solution:

Here, CIDR = 23

11111111.11111111.11111110.00000000

= 255.255.254.0

So, Subnet Mask = 255.255.254.0 (Ans - 1)

From CIDR we get host bit = $32 - 23 = 9$

So, Total Host = $2^9 = 512$

So, Unique or Usable Host = $512 - 2 = 510$ (Ans - 2)

(Because first host address is Network address and last host address is Broadcast address, these 2 host address is not used)

Now, to find Broadcast address we have to find Network address at First. We see that there is a change in 3rd and 4th octet of subnet mask.

So, we have to work with 3rd and 4th octet of the IP address.

3rd and 4th octet of Given IP = 10.0 = 00001010.00000000

3rd and 4th octet of subnet mask = 254.0 = 11111110.00000000

Now, To Find Network address -

ANDing the IP address with subnet mask we get

Network address's 3rd and 4th octet = 00001010.00000000

= 10.0

So, Network address = 192.168.10.0

(By chance, here Given IP address and Network address is same, it happens for CIDR 23, if CIDR changed, it will not remain same)

Now, From CIDR we know, here host bit = $32 - 23 = 9$
So, to get Broadcast address, we will make last 9 bits of Network address into 1
(here in 3rd and 4th octet)
So, 3rd and 4th octet of Broadcast address will be
= 00001011.11111111
= 11.255
So, Broadcast address = 192.168.11.255 (Ans - 3)

So, from the above discussion we get-
Network address = 192.168.10.0
So, First usable host address = 192.168.10.1
We also get above, Broadcast address = 192.168.11.255
So, Last usable host address = 192.168.11.254 (Ans - 4)

7. From this IP address 192.168.10.2/28, Answer the following questions consider IPV4 address -

Subnet Mask
Network address
Broadcast address
First Network address
Last Network Address

Solution:

Subnet Mask
= 11111111.11111111.11111111.11110000
= 255.255.255.240 (Ans - 1)

We get change in 4th octet of subnet mask
4th octet of IP = 0 = 00000010
4th octet of subnet mask = 11110000
ANDing 4th octet of IP with subnet mask
we get 00000000 = 0,
So, Network address = 192.168.10.0 (Ans - 2)

Here, CIDR = 28
So, making last $(32 - 28) = 4$ bits into 1 of network address
We get 00001111 = 15
So, broadcast address = 192.168.10.15 (Ans - 3)

First address is the next immediate address of Network address
So, First address = 192.168.10.1 (Ans - 4)
Last address is the prior immediate address of Broadcast address
So, Last address = 192.168.10.14 (Ans - 5)