Q:1. Find default subnet masks, network bits, host bits, hosts Per subnet, no of subnets, subnet number, 1'st valid IP addr., last valid IP addres. and broadcast address.

(i) 8.1.4.5 /16

Ans. ⟹

class : A

Default mask : 255.0.0.0

Given mask : /16 → 255.255.0.0

network bits : 16

Host bits : 16

Hosts bits : 16

Hosts Per subnet : $2^{16} - 2 = 65.534$

No. of subnet : $2^{(16-8)} = 256$

subnet number : 8.1.0.0

1'st valid IP : 8.1.0.1

Last valid IP : 8.1.255.254

Broadcast Address : 8.1.255.255

(ii) 130.4.102.1 /24

Ans. ⟹

class : B

Default mask : 255.255.0.0

Given mask : /24 → 255.255.255.0

Network bits : 24

Host bits : 8

Hosts Per subnet : $2^8 - 2 = 254$

No. of subnet : $2^{(24-16)} = 256$

subnet number : 130.4.102.0

1st valid IP : 130.4.102.1

last valid IP : 130.4.102.254

Broadcast address : 130.4.102.255

(iii) 130.4.102.1 / 22

Ans. ⇒

class : B

Default mask : 255.255.0.0

Given mask : /22 → 255.255.252.0

Network Bits : 22

Host Bits : 10

Hosts per subnet : $2^{(10-2)} = 1022$

No. of subnets : $2^{(22-16)} = 64$

subnet Number : 130.4.100.0

1'st valid IP : 130.4.100.1

last valid IP : 130.4.103.254

Broadcast address : 130.4.103.255

(iv) 199.1.1.100 / 27

Ans. ⇒

class : C

Default mask : 255.255.255.0

Given mask : /27 → 255.255.255.224

Network Bits : 27

Host Bits : 5

Hosts per subnet : $2^{(5-2)} = 30$

No. of subnets : $2^{(27-24)} = 8$

Subnet Number : 199.1.1.96

1'st valid IP : 199.1.1.97

last valid IP : 199.1.1.126

Broadcast address: 199.1.1.127

Q:-2 A host in a class C network has been assigned an IP address 192.168.17.9 Find the number of address in the block, the 1'st addr. and last address

Ans. ⟹

    class : C
    Default mask : 255.255.255.0 (/24)
    number of address : $2^8 = 256$
    1'st address : 192.168.17.0
    last address : 192.168.17.255

Q:-3 An address in a block is given as 185.28.17.9 find the number of address in the block, the first address, and the last address

Ans. ⟹

    class : B
    Default mask : 255.255.0.0 (/16)
    number of addr. in block : $2^{16} = 65.536$
    1'st address : 185.28.0.0
    last address : 185.28.255.255

Q:-4 A block of address is granted to a small organization. we know that one of the address is 205.16.37.39/28. what is the 1'st addr. last addr. and num. of addr. in a block?

Ans. ⟹

Class : C
Given Mask : /28 → 255.255.255.240
Block size : 16 ⟹ ($2^{(32-28)}$)
Number of addr. in Block : 16
subnet Number : 205.16.37.32
1'st Address : 205.16.37.32
last address : 205.16.37.47

Q:-5 subnet the IP address 216.21.5.0 into 30 host in each subnet.

Ans. ⟹

Class : C
Default Mask : 255.255.255.0
New subnet mask : 255.255.255.224 (/27)
Bit Borrowed : 3
Hosts Needed : 30
No. of Hosts /subnet : 30
No. of subnet : $2^3 = 8$
Network Ranges :
216.21.5.0 - 216.21.5.31
216.21.5.32 - 216.21.5.63
216.21.5.64 - 216.21.5.95
..... up to 216.21.21.224 - 216.21.5.255

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Q :- 6 subnet the IP address 192.10.20.0 into 52 hosts in each subnet.

Ans. ⟹

   class : C

   Default mask : 255.255.255.0 (/24)

   Hosts needed : 52

   Bit Borrowed : 2 bits

   new subnet mask : 255.255.255.192 (/26)

   No.of Hosts /subnet = 62

   No.of subnet's = 2^2 = 4

   network Ranges (subnets) :

- 192.10.20.0 - 192.10.20.63
- 192.10.20.64 - 192.10.20.127
- 192.10.20.128 - 192.10.20.191
- 192.10.20.192 - 192.10.20.255

Q :- 7 Determining the subnet mask for Devices.

  a) Device-A : 172.16.17.80/20

  Ans. ⟹

    subnet mask : 255.255.240.0

    network ID : 172.16.16.0

    Broadcast : 172.16.31.255

b) Device-B : 172.16.28.15/20

Ans. ⇒
    subnet mask : 255.255.240.0
    network ID : 172.16.16.0
    Broadcast : 172.16.31.255

⇒ Both devices are in the same subnet.