

Home Work-2 Page-16

Q.1 You have the IP address 186.111.0.0, this network is subnetted by 10-bits. Find the following:

i. Find the Subnet Mask.

Class-B [N: 16 and H: 16 bits]

Total Network Bits: $16+10 = 26$

$/26 = 255.255.255.192$

ii. Determine the number of usable hosts per subnet.

Total Network Bit = 26. So the host bits is $= 32-26 = 6$

$2^6 - 2 = 64 - 2 = 62$

iii. To which subnet the following IP's belong to: 186.111.169.213

$186.111.169.213 = 10111010.01101111.10101001.11010101$

$10101001.11 = 1010100111 = 679$

iv. Determine the network address and broadcast address of the subnet to which this ip belongs to: 186.111.169.213

$186.111.169.213$ and the subnet mask $255.255.255.192$

$186.111.169.213 = 10111010.01101111.10101001.11010101$

$255.255.255.192 = 11111111.11111111.11111111.11000000$

Network Address = $10111010.01101111.10101001.11000000 = 186.111.169.192$

Broadcast Address = $10111010.01101111.10101001.11111111 = 186.111.169.255$

v. Find Network Address, Broadcast Address and Host Range for the subnet # 121.

$186.111.0.0/26 = 10111010.01101111.00000000.00000000/26$

$121 = 0001111001$

Subnet # 121 = $10111010.01101111.00011110.01000000/26 = 186.111.30.64/26$

Network Address = $10111010.01101111.00011110.01000000/26 = 186.111.30.64/26$

Broadcast Address = $10111010.01101111.00011110.01111111/26 = 186.111.30.127/26$

1st IP Address = 186.111.30.65 Last IP Address = 186.111.30.126

Q.2 Given a host with IP address 160.50.145.189/21:

i. Is a host with IP address 160.50.146.210/21 part of the same network? Show calculations.

Network Bit = 21

160.50.145.189 = 10100000.00110010.10010001.10111101

160.50.146.210 = 10100000.00110010.10010010.11010010

Yes, this two IP address are part of the same subnet.

ii. Is the IP address 160.50.145.255 valid according to the given IP? Why or why not?

Network Bit = 21

160.50.145.255 = 10100000.00110010.10010001.11111111

Yes, this Address is a Valid IP Address. Because the host part is a combination of one and zero.

iii. What is the first valid host on the subnetwork that the node 172.18.142.179 255.255.254.0 belongs to?

172.18.142.179 = 10101100.00010010.10001110.10110011

255.255.254.0 = 11111111. 11111111. 11111110.00000000

Network address = 10101100.00010010.10001110.00000000 = 172.18.142.0

1st IP Address = 172.18.142.1

iv. Which subnet does host 192.168.11.198 255.255.255.240 belong to?

Class -C [N: 24 and H: 8]

192.168.11.198 = 11000000.10101000.00001011.11000110

255.255.255.240 = 11111111.11111111.11111111.11110000

Subnet = 1100 = 12

v. What is the last valid host on the subnetwork 192.168.98.176 255.255.255.240?

192.168.98.176 = 11000000.10101000.01100010.10110000

255.255.255.240 = 11111111.11111111.11111111.11110000

Broadcast = 11000000.10101000.01100010.10111111 = 192.168.98.191

Last IP Address = 192.168.98.190

vi. What is the last valid host on the subnetwork 172.25.13.112 255.255.255.240?

172.25.13.112 = 10101100.00011001.00001101.01110000

255.255.255.240 = 11111111.11111111.11111111.11110000

Broadcast Address = 10101100.00011001.00001101.01111111 = 172.25.13. 127

Last IP Address = 172.25.13. 126

vii. How many subnets and hosts per subnet can you get from the network 10.0.0.0 255.255.240.0?

Class-A [N: 8 and H:24]

255.255.240.0 => H: 20 and H: 12

Subnet Bit = 20-8 = 12 So, Total Subnet = 2^{12}

Host = 12 So, Host per Subnetwork = $2^{12}-2$

viii. What is the first valid host on the subnetwork that the node 192.168.207.190/28 belongs to?

192.168.207.190 = 11000000.10101000.11001111.10111110

/28 = 255.255.255.240 = 11111111.11111111.11111111.11110000

Network Address = 11000000.10101000.11001111.10110000 = 192.168.207. 176

1st IP Address = 192.168.207. 177