Q2. How can you dedicate 32,65, 10,21,9 public IP address to the departments A, B, C, D and E respectively form the pool of class C IP addresses with minimum loss. Explain

ANS:

Let ip address used be 192.10.1.0 /24

Department C:

The required host = 10+2 =12

Now, 12 <= 2^4 i.e 4 bits

Subnet mask 255.255.255.240

Network id = 192.10.1.0

Useable Id = (192.10.1.1) to (192.10.1.14)

Broadcast Id = 192.10.1.15

Department E:

The required host = 9+2 = 11

Now, 11 <= 2^4 i.e 4 bits

Subnet mask 255.255.255.240

Network id = 192.10.1.16

Useable Id = (192.10.1.17) to (192.10.1.30)

Broadcast Id = 192.10.1.31

Department D:

The required host = 21+2 = 23

Now, 23 <= 2^5 i.e 5 bits

Subnet mask 255.255.255.224

Network id = 192.10.1.32

Useable Id = (192.10.1.33) to (192.10.1.62)

Broadcast Id = 192.10.1.63

Department A:

The required host = 32+2 = 34

Now, 34 <= 2^6 i.e 6 bits

Subnet mask 255.255.255.192

Network id = 192.10.1.64

Useable Id = (192.10.1.65) to (192.10.1.126)

Broadcast Id = 192.10.1.127

Department B:

The required host = 65+2 = 67

Now, 67 <= 2^7 i.e 7 bits

Subnet mask 255.255.255.128

Network id = 192.10.1.128

Useable Id = (192.10.1.129) to (192.10.1.254)

Broadcast Id = 192.10.1.255

Q3. Suppose you are a private consultant hired by a company to setup the network for their enterprise and you are given a large number of consecutive IP address starting at 120.89.96.0/19. Suppose that four departments A, B, C and D request 100, 500, 800 and 400 addresses respectively, how the subnetting can be performed so that address wastage will be minimum?

ANS:

Department C:

The required host = 800+2 =802

Now, 802 <= 2^{10} i.e 10 bits

Subnet mask 255.255.252.0

Network id = 120.89.96.0

Useable Id = (120.89.96.1) to (120.89.99.254)

Broadcast Id = 192.10.99.255

Department B:

The required host = 500+2 =502

Now, 502 <= 2^9 i.e 9 bits

Subnet mask 255.255.254.0

Network id = 120.89.100.0

Useable Id = (120.89.100.1) to (120.89.101.254)

Broadcast Id = 192.10.101.255

Department D:

The required host = 400+2 =402

Now, 402 <= 2^9 i.e 9 bits

Subnet mask 255.255.254.0

Network id = 120.89.101.0

Useable Id = (120.89.101.1) to (120.89.102.254)

Broadcast Id = 192.10.102.255

Department A:

The required host = 100+2 =102

Now, 102 <= 2^7 i.e 7 bits

Subnet mask 255.255.255.128

Network id = 120.89.103.0

Useable Id = (120.89.103.1) to (120.89.103.127)

Broadcast Id = 192.10.103.128

Q4. You are a private contractor hired by the large company to setup the network for their enterprise and you are given a large number of consecutive IP address starting at 202.70.64.0/19. Suppose that four department A, B, C and D request 100, 500, 800 and 400 addresses respectively, how the subnetting can be performed so, that address wastage will be minimum?

ANS:

Department C:

The required host = 800+2 =802

Now, 802 <= 2^{10} i.e 10 bits

Subnet mask 255.255.252.0

Network id = 202.70.64.0

Useable Id = (202.70.64.1) to (202.70.67.254)

Broadcast Id = 202.70.67.255

Department B:

The required host = 500+2 =502

Now, 502 <= 2^9 i.e 9 bits

Subnet mask 255.255.254.0

Network id = 202.70.68.0

Useable Id = (202.70.68.1) to (202.70.71.254)

Broadcast Id = 202.70.71.255

Department D:

The required host = 400+2 =402

Now, 402 <= 2^9 i.e 9 bits

Subnet mask 255.255.254.0

Network id = 202.70.72.0

Useable Id = (202.70.72.1) to (202.70.73.254)

Broadcast Id = 202.70.73.255

Department A:

The required host = 100+2 =102

Now, 102 <= 2^7 i.e 7 bits

Subnet mask 255.255.255.128

Network id = 202.70.74.0

Useable Id = 202.70.73.1) to (202.70.73.127)

Broadcast Id = 202.70.73.128

Q5. Explain how can you allocate 30, 24, 25 and 20 IP addresses to the four different department of ABC company with minimum wastage. Specify the range of IP addresses, Broadcast Address, Network Address and Subnet mask for each department form the given address pool 202.77.19.0/24

ANS:

Let department A, B, C, D has 30, 24, 25 and 20 ip addresses for ABC company

Department A:

The required host = 30+2 =32

Now, 32 <= 2^5 i.e 5 bits

Subnet mask 255.255.255.224

Network id = 202.77.19.0

Useable Id = (202.77.19.1) to (202.77.19.30)

Broadcast Id = 202.77.19.31

Department B:

The required host = 24+2 =26

Now, 26 <= 2^5 i.e 5 bits

Subnet mask 255.255.255.224

Network id = 202.77.19.32

Useable Id = (202.77.19.33) to (202.77.19.62)

Broadcast Id = 202.77.19.63

Department C:

The required host = 25+2 =27

Now, 27 <= 2^5 i.e 5 bits

Subnet mask 255.255.255.224

Network id = 202.77.19.64

Useable Id = (202.77.19.65) to (202.77.19.94)

Broadcast Id = 202.77.19.95

Department D:

The required host = 20+2 =22

Now, $22 <= 2^5$ i.e 5 bits

Subnet mask 255.255.255.224

Network id = 202.77.19.96

Useable Id = (202.77.19.97) to (202.77.19.126)

Broadcast Id = 202.77.19.127