1. Subnet the IP 200.10.10.0/24 for
    a) Head Office(HO) LAN (100 valid hosts)
    b) Branch Office(BO) LAN (50 valid hosts)
    c) WAN (2 valid hosts)

We have a network address of 200.10.10.0/24 which is to be broken down into three subnet with following information.

Head Office (H0): 100 valid hosts

Branch Office (BO): 50 valid hosts

WAN: 2 valid hosts.

Head Office (100 valid hosts)

Using formula.

$2^h - 2$ = no of usuable host

$2^h - 2 = 100$

$2^h = 102$

$2^h = 128$

$2^h = 2^7$

$h = 7$

Calculating new subnet mask:

11111111. 11111111. 11111111. 10000000

CIDR values = /25

Subnet mask = 255.255.255.128

Subnet Table

Subnet	Network address	Usuable IP	Broadcast IP
Head Office	200.10.10.0 / 25	200.10.10.1 /25 to 200.10.10.126 /25	200.10.10127 /25

Branch Office (50 valid hosts)

Using formula

$2^h - 2$ = no of usuable host

$2^h - 2 = 50$

$2^h = 52$

$2^h = 64$

$2^h = 2^6$

$h = 6$

Calculating new subnet mask

11111111. 11111111. 11111111. 11000000

CIDR values = / 26

Subnet mask = 255.255.255.192

Subnet Table

Subnet	Network address	Usuable IP	Broadcast IP
Head Office	200.10.10.0 / 25	200.10.10.1 /25 to 200.10.10.126 /25	200.10.10.127 / 25
Branch Office	200.10.10.128 / 26	200.10.10.129 /26 to 200.10.10.190 / 26.	200.10.10.191 /26

WAN (2 hosts)

Using formula

$2^h - 2$ = no of usuable host

$2^h - 2 = 2$

$2^h = 4$

$2^h = 2^2$

h = 2

Calculating new Subnet mask

11111111. 11111111. 11111111.11111100

CIDR values = /30

Subnet mask = 255.255.255.252

Subnet Table

Subnet	Network address	Usuable IP	Broadcast IP
Head office	200.10.10.0 /25	200.10.10.1 /25 to 200.10.10.126 /25	200.10.10.127 /25
Branch office	200.10.10.128 /26	200.10.10.129 /26 to 200.10.10.190 /26	200.10.10.191 /26
WAN	200.10.10.192 /30	200.10.10.193 /30 to 200.10.10.194 /30	200.10.10.195 /30